



WORKFORCE EVALUATION REPORT

Workforce Innovation and Opportunity Act

Title I Adult Training Programs

**An Evaluation of ARIZONA@WORK Title I Adult Training Programs on Participant
Employment and Wage Outcomes**

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Executive Summary

The Arizona Office of Economic Opportunity (OEO) leads efforts to evaluate the Arizona workforce system, per its mandate under A.R.S. 41-5303 as the state's workforce coordinator. In collaboration with the Workforce Arizona Council, OEO measures and reports on the performance of Arizona's workforce and education programs to improve their effectiveness in assisting Arizonans gain the skills needed to obtain sustained, high-paying employment.

The ARIZONA@WORK Title I Adult Occupational Training Programs evaluation assesses how effectively training completion impacts participant employment and wage outcomes. The evaluation focuses exclusively on participants in the Title I Adult Program, which serves individuals aged 18 and older who are not classified as dislocated workers or youth participants. The report analyzed 17,228 records of participants who exited the workforce system between Quarter 2 (Q2) 2020 and Quarter 1 (Q1) 2023, of which 5,130 completed at least one training program. Only training programs with five or more completers were evaluated and assigned a training effectiveness rating, resulting in 4,320 participants completing training in programs meeting this threshold. The study measured effectiveness using three key performance metrics: employment in the second and fourth quarters after exit and average wages in the second quarter after exit.

Key findings include:

- **Training Subject Performance:** Health Professions and Transportation programs accounted for the largest share of training providers and participants, making up 78% of total enrollment. Homeland Security and Law Enforcement had the highest completion rate at 88%, while Health Professions and Mechanic and Repair were most effective at improving employment rates.
- **Employment and Wage Outcomes:** Participants in Homeland Security programs showed the highest average wage (\$13,761) in the second quarter after exit, followed by Transportation and Information Sciences. Health Professions and Engineering training showed strong job retention, with employment rates of 80% and 72% in the fourth quarter, respectively.
- **Employment and Wage Improvements:** Mechanic and Repair Technologies demonstrated the largest impact on second-quarter employment, improving participant success rates by 16.8 percentage points over non-completers. Health Professions and Homeland Security subjects showed consistent wage and employment gains, underscoring their alignment with Arizona's high-demand labor market sectors.
- **Training Program Ratings:** Programs received ratings of "Exceeded Expectations," "Met Expectations," or "Below Expectations" based on how actual participant outcomes compared to predicted outcomes. Of the evaluated programs, 43% (38 programs) exceeded expectations, particularly in Health Professions, Information Sciences, and Homeland Security subjects. Fields such as Culinary Arts had higher rates of "Below Expectations" ratings.

Conclusion: This evaluation provides a data-driven framework for identifying high-impact programs for training effectiveness across Arizona's workforce development system. By continuously assessing program outcomes, ARIZONA@WORK can better understand the training requirements needed to meet evolving labor market demands. OEO will share the report's findings through webinars, workshops, and in-person meetings with the WAC, the Department of Economic Security (DES), training providers, and other key partners. Accessible materials such as summaries, training program evaluation reports, web tools, and presentations will be created to ensure the results are easily understood and actionable for diverse audiences.

Introduction

As Arizona's population and job market growth continue to outpace the rest of the nation, the effective use of limited workforce development resources is essential. The Arizona Office of Economic Opportunity (OEO) leads efforts to evaluate the Arizona workforce system, per its mandate under A.R.S. 41-5404 as the state's workforce coordinator. In collaboration with the Workforce Arizona Council, OEO measures and reports on the performance of Arizona's workforce and education programs to improve their effectiveness in assisting Arizonans gain the skills needed to obtain sustained, high-paying employment.

This report evaluates the ARIZONA@WORK Title I Adult Occupational Training Programs, assessing the impact of training completion on employment and wage outcomes among participants. The report offers insights into program effectiveness across training providers and program subject areas. The goal is to help inform the ARIZONA@WORK system by identifying and understanding the effectiveness of training programs by training program subject categories.

About this Report

The report examines the employment and wage outcomes of ARIZONA@WORK Title 1 Adult program participants who completed an occupational training program. The Adult program is one of three programs under Title I of the Workforce Innovation and Opportunity Act (WIOA), which aims to increase access to training, employment, and career services for various groups facing employment barriers.

The study uses data from 17,228 Adult Program participants who exited the ARIZONA@WORK system between Q2 2020 and Q1 2023. Of these participants, 7,373 entered an occupational skills training program and 5,130 completed at least one occupational skills training program. The remaining 12,098 participants either did not enter training or did not complete a training program.

Only programs with a minimum of five completers were included when evaluating training program effectiveness to maintain participant confidentiality and modeling accuracy. A total of 55 training providers, 88 training programs, and 4,230 training completers met the minimum participant completer requirement for all three performance measures and were included in the analysis. An additional 164 providers, 566 programs, and 900 training completers did not meet this threshold and were excluded from the study.

Figure 1. Training Participant Overview



*Programs being evaluated in this study

The performance measures and evaluation period used are as follows:

Performance Measure	Evaluation Period
Employment 2nd Quarter After Exit	Q2 2020–Q1 2023
Employment 4th Quarter After Exit	Q4 2019–Q3 2022
Average Wage 2nd Quarter After Exit	Q2 2020–Q1 2023

Training Subject Overview

This section examines ARIZONA@WORK training providers, program offerings, and participant outcomes across various training subjects. Key metrics, including participant entry and completion rates, provide insights into which training subjects yield the highest engagement and success rates, helping to identify strengths and areas for improvement within the workforce development system.

Table 1. Training Programs by Subject

Training Subject Type ¹	Training Provider	Training Program ²	Participant Entered Training	Participant Completed Training ³	Completion Rate ⁴
Computer and Information Sciences and Support Services	28	55	272	156	57%
Culinary, Entertainment, and Personal Services	35	58	357	299	84%
Engineering/Engineering-Related Technologies/Technicians	16	22	99	77	78%
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	11	18	147	130	88%
Construction Trades	20	23	109	92	84%
Mechanic and Repair Technologies/Technicians	19	25	93	74	80%
Precision Production	14	14	51	44	86%
Transportation and Materials Moving	50	64	3148	2573	82%
Health Professions and Related Programs	106	272	1932	1485	77%
Business, Management, Marketing, and Related Support Services	22	51	178	128	72%
Other Training Subject Types ⁵	48	52	98	72	73%
Total	219⁶	654	6484	5130	79%

1. Training subject types are based on the names associated with the two-digit Classification of Instructional Programs (CIP) codes.
2. Training program counts were determined by the number of six-digit CIP codes.
3. The counts of participants who entered and completed training were based on participants who exited the ARIZONA@WORK Title I Adult Program between Q2 2020 and Q1 2023.
4. The completion rate was calculated by dividing the number of participants who completed training by the number of participants who entered the training program.
5. Training subject types that contain programs with less than five completers were included in the "Other Training Subject Types" category.
6. Total training provider count represents the number of unique providers.

Training Providers and Programs by Subject

The ARIZONA@WORK system included 219 training providers who offered 654 programs across ten primary subjects that at least one ARIZONA@WORK Adult program participant completed during the evaluation period. These subjects vary widely in provider concentration and program offerings, with some subjects more densely represented than others. Health Professions led in provider and program availability, offering 272 programs, representing over 40% of all training offerings. The training subject with the second-largest number of programs being offered was Transportation and Materials Moving.

Participant Entry and Engagement by Subject

Participant enrollment was highest in Transportation and Materials Moving training, which alone attracted almost half (N=3,148) of all training entrants. This was followed by Health Professions, which attracted nearly 30% (N=1,932) of training entrants. Together, these subjects account for more than three-quarters of all program entries.

Completion Rates by Training Subject

Completion rates varied widely, ranging as high as 88% and as low as 57%. Homeland Security, Law Enforcement, Firefighting, and Related Protective Services training had the highest program completion rate, despite a limited number of available programs, highlighting strong participant engagement and successful outcomes in this field. Transportation and Materials Moving follows with the second-highest completion rate, representing 45% of the total program completers. Computer and Information Sciences and Support Services; and Business Management, Marketing, and Related program completion lagged significantly, suggesting potential barriers that may require further evaluation.

Outcomes by Training Subject

This section evaluates the employment and wage outcomes for participants who completed ARIZONA@WORK Title I Adult training programs, focusing on three key metrics: employment in the second quarter after exit, employment in the fourth quarter after exit, and average wages in the second quarter after exit. By analyzing these outcomes across various training subjects, the section highlights the effectiveness of each training area in securing long-term employment and competitive wages for participants.

Table 2. Training Outcomes by Subject

Training Subject Type	Employment 2nd Qtr. After Exit	Employment 4th Qtr. After Exit	Average Quarterly Wage 2nd Qtr. After Exit
Computer and Information Sciences and Support Services	78%	69%	\$9,468
Culinary, Entertainment, and Personal Services ²	56%	56%	\$6,485
Engineering/Engineering-Related Technologies/Technicians	64%	72%	\$8,899
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	93%	90%	\$13,761
Construction Trades	63%	66%	\$8,659
Mechanic and Repair Technologies/Technicians	89%	78%	\$9,333
Precision Production	68%	67%	\$7,954
Transportation and Materials Moving	76%	67%	\$10,203
Health Professions and Related Programs	84%	80%	\$8,503
Business, Management, Marketing, and Related Support Services	70%	64%	\$7,816

Employment in the Second Quarter after Exit

Employment rates in the second quarter after program exit varied notably by training subject, highlighting the immediate job market alignment of certain fields:

- Homeland Security, Law Enforcement, Firefighting, and Related Protective Services achieved the highest second-quarter employment rate at 93%, reflecting the field’s strong demand and high placement rate.
- Mechanic and Repair Technologies followed, driven by growing demand for high-skilled workers and high placement rate.
- Lower employment rates in fields like Culinary, Entertainment, and Personal Services (56%) suggest areas where additional support could improve outcomes.

Employment in the Fourth Quarter after Exit

Fourth-quarter employment rates demonstrate each field's ability to support sustained employment, with retention trends (consistent employment from the second to the fourth quarter) varying by subject:

- Homeland Security, Law Enforcement, Firefighting, and Related Protective Services continued to lead with a 90% employment rate, suggesting stable long-term demand.
- Health professions maintained strong retention rates, decreasing to 80% in the fourth quarter after exit from 84% in the second quarter after exit, reflecting a sustained demand for participants' skill sets.
- Fields like Engineering showed improvement in employment in the fourth quarter (72% employment) compared to the second quarter after exit (64% employment), while Mechanic and Repair Technologies recorded the largest drop in employment retention between employment in the second quarters after exit (89%) and fourth quarters after exit (78%), suggesting challenges in job stability.

Average Quarterly Wage in the Second Quarter After Exit

Average quarterly wage outcomes varied by subject, underscoring disparities in earning potential across fields:

- Homeland Security, Law Enforcement, Firefighting, and Related Protective Services yielded the highest quarterly wages, with an average second-quarter wage of \$13,761, highlighting its high-income potential.
- Transportation and Materials Moving also showed strong wage outcomes at \$10,203, supporting participants' economic mobility.
- Computer and Information Sciences and Support Services and Mechanic and Repair Technologies programs demonstrated solid wage outcomes, averaging \$9,468 and \$9,333, respectively.

Training Subject Effects

This section provides an adjusted assessment of training subject outcomes by accounting for participants' demographic characteristics, employment barriers, and prevailing economic conditions. Recognizing that these factors can influence employment and wage results, the analysis aims to isolate the impact of training itself on post-completion outcomes. Table 3 presents these adjusted outcomes for each of the ten training subjects, showing employment rates in the second and fourth quarters after exit and wages in the second quarter after exit. By comparing these outcomes between training completers and non-completers, the table offers a more nuanced view of each subject's effectiveness in enhancing job placement and income potential under real-world conditions.

Table 3. Training Subject Effect

Training Subject Type	Training Subject Effect on Employment and Wage Outcomes		
	Emp. 2nd Qtr. After Exit	Emp. 4th Qtr. After Exit	Average Quarterly Wage 2nd Qtr. After Exit
	Change ¹	Change ¹	Change ¹
Computer and Information Sciences and Support Services	+7.9%	+4.5%	+\$1,052
Culinary, Entertainment, and Personal Services ²	-12.1%	-11.0%	-\$901
Engineering/Engineering-Related Technologies/Technicians	+4.6%	+10.5%	+\$1,496
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	+10.2%	+9.3%	+\$4,793
Construction Trades	+3.4%	+2.8%	+\$443
Mechanic and Repair Technologies/Technicians	+16.8%	+10.7%	+\$1,233
Precision Production	+1.2%	+7.6%	+\$693
Transportation and Materials Moving	+9.0%	+3.3%	+\$2,211
Health Professions and Related Programs	+13.2%	+11.6%	+\$927
Business, Management, Marketing, and Related Support Services	+3.4%	-0.2%	+\$199
Reference Group: Participants who did not enter/complete a training	—	—	—

1. Bold values suggest that the outcome measures for participants who completed training in a given training subject were significantly different than the outcomes of participants who did not enter/complete a training.

2. The majority of programs within this subject are Cosmetology and Related Personal Grooming Services.

After accounting for demographic factors, employment barriers, and economic conditions, the adjusted estimates revealed the impact of each training subject on employment and wage outcomes for participants who completed training compared to those who did not.

Employment in the Second Quarter after Exit

- Mechanics and Repair had the largest impact on second-quarter employment results, improving employment success by 16.8 percentage points over similar participants who did not complete the training program.
- Health Professions showed the second-strongest impact and improved employment outcomes by 13.2 percentage points in the second quarter after exit.
- There were four training subjects (Engineering, Construction, Precision Production, and Business subjects) that were not significant ($p\text{-value} > 0.05$), meaning that the effects of completing these training programs are similar to participants who did not complete the program.

Employment in the Fourth Quarter after Exit

- Health Professions and Engineering programs had the greatest impact on fourth-quarter employment outcomes, improving employment success rates by 11.6 and 10.5 percentage points, respectively, compared to non-completers.

- Computer, Construction, Precision Production, and Business programs were not significant ($p\text{-value} > 0.05$), indicating that completers in these training programs had similar employment outcomes to participants who did not complete the program.

Average Wages in the Second Quarter After Exit

- Homeland Security, Law Enforcement, Firefighting, and Related Protective Services demonstrate the largest wage effect, with program completers earning an additional \$4,793 compared to non-completers.
- Three training subjects (Construction, Precision Production, and Business) were not significant ($p\text{-value} > 0.05$), indicating that completers had wage outcomes similar to those of non-completers.

Training Evaluation Results

This section outlines the scoring system developed to assess ARIZONA@WORK training program effectiveness, helping workforce practitioners and job seekers distinguish between highly effective, average, and less effective programs.

Individual Outcome Evaluation

The Individual Outcome Evaluation assesses the effectiveness of each training program by examining three outcome metrics:

- **Employment in the second quarter after exit:** Measures the immediate job placement success of participants after completing their training program.
- **Employment in the fourth quarter after exit:** Evaluates participants' ability to maintain employment over a longer period, reflecting program effectiveness in fostering sustainable job retention.
- **Average wages in the second quarter after exit:** Assesses the financial impact of the training, indicating how well programs prepare participants for roles that offer competitive compensation.

Each program receives a rating from 1 to 3 for each outcome metric, where:

- **Rating 1** indicates actual outcomes below the lower bound of predicted results.
- **Rating 2** reflects actual outcomes within the predicted range (between the lower and upper bounds).
- **Rating 3** is awarded for actual outcomes exceeding the upper bound of predicted results.

This rating system accounts for data variability by using a predictive range (upper and lower bounds) rather than a single predicted value, providing a more nuanced and reliable measure of program impact. The approach ensures fairness by adjusting for participant characteristics, employment barriers, and economic conditions, isolating the true effectiveness of the training program itself.

Programs that consistently achieve higher individual outcome ratings demonstrate their ability to deliver measurable benefits to participants, including better employment stability and higher earnings potential. These ratings also enable workforce practitioners and job seekers to distinguish between programs that deliver exceptional results and those that may require further improvements or refinements.

For a detailed explanation of the predictive model and methodology used to generate these ratings, please refer to the Technical Notes section.

Overall Training Program Evaluation

This section presents an overall rating system for ARIZONA@WORK training programs, combining individual scores for employment in the second and fourth quarters after exit and wages in the second quarter after exit. Programs were assigned a rating of "Exceeded Expectations," "Met Expectations," or "Below Expectations" based on their total scores across these three outcome measures, provided data was available for each measure.

Programs that scored 7 to 9 were rated as "Exceeded Expectations," indicating strong performance above predicted outcomes. Programs with a score of 6 "Met Expectations," showed outcomes aligned with benchmarks, while those scoring 3 to 5 "Below Expectations" performed below predicted ranges.

A total of 88 programs were evaluated. Of these, 43% (38 programs) exceeded expectations, 20% (18 programs) met expectations, and 36% (32 programs) were below expectations. Table 4 captures the distribution of program effectiveness by training subject type.

Table 4. Training Subject Overall Effectiveness

Training Subject Type	Training Program			
	Below Expectations	Met Expectations	Exceeded Expectations	Total
Computer and Information Sciences and Support Services	2	1	2	5
Culinary, Entertainment, and Personal Services	5	0	0	5
Engineering/Engineering-Related Technologies/Technicians	0	0	2	2
Homeland Security, Law Enforcement, Firefighting, and Related Protective Services	0	1	2	3
Construction Trades	0	1	1	2
Mechanic and Repair Technologies/Technicians	1	0	2	3
Precision Production	2	0	0	2
Transportation and Materials Moving	6	5	2	13
Health Professions and Related Programs	13	10	25	48
Business, Management, Marketing, and Related Support Services	3	0	2	5
Total	32	18	38	88

The effectiveness ratings reveal significant variation in program outcomes across subjects, with some fields consistently exceeding expectations and others showing areas for improvement:

- Health Professions had the highest share of programs rated "Exceeded Expectations," indicating strong alignment with labor market demands and consistent achievement of positive employment and wage outcomes.
- The Transportation and Materials Moving subject showed a balanced distribution of ratings, with a significant portion meeting expectations but varied effectiveness across providers. This indicates opportunities for standardizing program quality within this subject to maximize job placement and wage outcomes.
- Culinary Arts and Personal Services had the highest proportion of programs rated "Below Expectations," with the majority of these programs focused on Cosmetology and Related Personal Grooming Services. These fields often lead to self-employment opportunities, which are not captured by the unemployment insurance tax data used to verify employment and wages. This

limitation may contribute to data gaps that obscure accurate tracking of employment outcomes, making it challenging to fully assess program effectiveness. Further investigation is needed to determine if the lower ratings stem from market demand issues or if self-employment rates are impacting reported outcomes.

This distribution of ratings across training subjects provides insights for ARIZONA@WORK to prioritize funding for high-impact programs, standardize quality in mixed-performing fields, and explore potential enhancements for programs currently rated below expectations.

Key Insights

1. Health Professions and Transportation had the highest number of training providers and programs, making up over half of all programs offered. Participants in these two fields accounted for 78% of the total enrollment.
2. The Homeland Security, Law Enforcement, Firefighting, and Related Protective Services programs had the highest completion rate (88%) among all training subjects
3. Training programs in the Health Professions and Mechanic and Repair categories were the most effective in improving participant employment rates. Meanwhile, programs in Homeland Security, Law Enforcement, Firefighting and Related Protective Services showed the strongest impact on wage outcomes.
4. Forty-three percent of programs being evaluated exceeded performance expectations, with Health Professions programs representing the largest share.

Caveats and Considerations

Exclusion of Self-Employment Data

Many programs, especially within subjects like Cosmetology and Personal Services, prepare participants for self-employed careers. However, because employment and wage data rely on unemployment insurance tax records, outcomes for self-employed individuals are not captured. This limitation may lead to an underrepresentation of successful employment outcomes for training programs that commonly lead to self-employment. OEO is working with the Arizona Department of Revenue to obtain self-employment data to improve the capabilities of this evaluation.

Other Considerations

- For participants who took more than one training, only the last training completed was considered.
- Training programs offered by training providers were combined at the six-digit (Classification of Instructional Programs (CIP) level.
- The performance measures for wage outcomes used in the evaluation were based on average wages, while the official metric used by WIOA is median wages. Outliers were removed to enhance the accuracy of using average wages.
- Participant records for those employed outside of Arizona were not included in the evaluation per confidentiality restrictions outlined in the State Interchange System (SWIS) data-sharing agreement.

Application and Conclusion

The data provided in this report equips ARIZONA@WORK stakeholders—including workforce operators, local workforce boards, and the Workforce Arizona Council—with actionable insights into training program effectiveness across key subjects. By using historical and adjusted outcome data, stakeholders can identify high-impact training program subject categories. This data-driven approach supports informed decision-making, enabling ARIZONA@WORK to better understand the effectiveness of training program subject categories in affecting employment and wage outcomes for participants.

The report highlights both strengths and areas for improvement within ARIZONA@WORK's training programs. By continuously evaluating and adjusting program offerings based on real-world outcomes, ARIZONA@WORK can enhance its impact, empowering participants with skills that lead to meaningful, sustainable employment and supporting Arizona's evolving workforce landscape.

Next Steps

Following the publication of this evaluation report, OEO will take targeted actions to ensure workforce development partners understand the findings. In collaboration with the WAC, DES, local workforce development areas (LWDAs), Title I training providers, and one-stop operators, OEO will focus on disseminating findings, engaging stakeholders, and building out user-friendly online tools, dashboards, and individual training program reports.

OEO also plans to publish more detailed employment and wage outcome analyses by training programs for Title I Adult program participants. This will give ARIZONA@WORK partners the opportunity to better understand the effectiveness of specific training programs on participant employment and wage outcomes. This information will be released after OEO meets with ARIZONA@WORK partners about the findings of this report.

Technical Notes

The statistical adjustment model (SAM) for training programs is a multiple linear regression model designed to predict participant outcomes and evaluate the effectiveness of ARIZONA@WORK training programs. Developed by OEO, the model estimates expected employment and wage outcomes by factoring in participant characteristics and local economic conditions, providing a baseline to assess the true impact of training completion.

The methodology used in this report closely aligns with the U.S. Department of Labor's (DOL) SAM for WIOA Title I performance evaluations. Similar to the DOL model, this approach incorporates a multiple regression framework to predict participant outcomes while accounting for differences in demographic characteristics, employment barriers, and local economic conditions. By isolating these external factors, both models aim to level the playing field when comparing program performance and identifying areas for improvement.

Model Objective

The primary objective of the model is to isolate the effects of training programs by accounting for external factors—demographics, employment barriers, and economic conditions—thus enabling a more accurate evaluation of program effectiveness.

Dependent variables

The model focuses on three key outcome measures:

1. Employment in the second quarter after exit
2. Employment in the fourth quarter after exit
3. Average wages in the second quarter after exit

Each outcome is treated as a dependent variable in separate multiple linear regression models, while participant characteristics and economic environment variables serve as independent variables. The linear regression model is expressed as

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_k X_k + \varepsilon$$

where Y is the the dependent variable, β_0 is the intercept, β_k s are the coefficients corresponding to the independent variables, and ε is the error term.

Independent Variables

To predict employment and wage outcomes, the model includes the following independent variables:

- Participant Characteristics: Age, education level, race and ethnicity, employment barriers (e.g., disability, veteran status), and training subject area. Participants' demographics help account for variances in outcomes based on personal factors.
- Local Economic Conditions: Unemployment rates from the Bureau of Labor Statistics are included to reflect labor market dynamics during participants' job searches. For example:
 - The unemployment rate two-quarters post-exit was used to predict employment and wage outcomes in the second quarter after exit.
 - The unemployment rate four quarters post-exit was used for predicting employment in the fourth quarter after exit.

These economic indicators attempted to capture the real-world conditions participants faced.

Participant and Data Scope

The statistical models were created using data records from 32,238 participants who exited the ARIZONA@WORK Title I Adult programs from Q1 2018 to Q1 2023, drawn from the U.S. Department of Labor's Participant Individual Record Layout (PIRL) reports. The PIRL reports are derived from individual records data generated by Arizona Job Connections (AJC), which contain detailed data on each participant's demographics and training entries. Employment and wage outcomes are sourced from the unemployment insurance wage records. Of the total participants:

- 8,717 completed at least one training program.
- 3,061 entered training but did not complete it.
- 20,460 did not enter training.

Programs with fewer than five completers were excluded to maintain statistical reliability, resulting in a final dataset of 55 providers and 88 programs. The workforce evaluation report included data from the most recent three-year period (Q2 2020 - Q1 2023).

Model Assumptions and Validation

The model relies on several key assumptions for accurate predictions, including:

1. **Linearity:** Assumes that the relationship between each predictor and the outcome is linear. The model uses categorical variables coded as binary, making the linearity assumption straightforward.
2. **No Multicollinearity:** Independent variables should not be highly correlated. Variance Inflation Factor (VIF) scores were calculated, and variables with VIF scores exceeding 10 (age variables) were retained to simplify interpretation, as removing them did not improve model fit.
3. **No Autocorrelation:** Ensures that residual errors are independent. The Durbin-Watson test confirmed a lack of autocorrelation with a coefficient of 1.97.
4. **Outliers:** Outliers in wage data were identified using interquartile range (IQR) calculations. Wages exceeding \$21,393.74 (1.5 times the IQR above the upper quartile) were removed to improve model reliability.

Feature Selection and Model Comparison

Two models were initially tested: multiple linear regression and logistic regression. OEO selected multiple linear regression due to its interpretability and alignment with the SAM for Local Area assessments. To aid negotiations with states to establish performance standards, the DOL provides local area estimates through a statistical adjustment model. For ease of interpretation, DOL uses a linear regression model, even though the dependent variable is binary. Both linear and logit models were tested, and the results showed that the model coefficients were similar across both approaches. OEO developed three separate linear regression models to predict each dependent variable (employment in the second and fourth quarters after exit, and average wages in the second quarter after exit).

Evaluation Methods

The model employs two primary evaluation methods to assess training program effectiveness:

1. **Training Subject Effects:** This method quantifies the overall impact of training subjects by comparing employment and wage outcomes for completers in each subject to those of non-completers. Program subjects with positive coefficients in the model indicate a favorable effect on outcomes, while negative coefficients suggest outcomes that are less effective than non-completers.
2. **Program-Level Evaluation by Provider:** To evaluate specific training programs offered by multiple providers, the model compares actual outcomes of program completers with predicted outcomes based on their demographic and economic characteristics. This approach helps to assess not only the subject effectiveness but also the influence of program quality and provider differences on participant success.

Scoring System and Outcome Measure Ratings

The model assigns scores to programs based on their performance relative to predicted outcomes:

- Rating 1: Actual outcomes are below the lower bound of the predicted range.
- Rating 2: Actual outcomes fall within the predicted range.
- Rating 3: Actual outcomes exceed the upper bound of the predicted range.

Each program's overall rating is a cumulative total of scores across the three outcome measures (second-quarter employment, fourth-quarter employment, and second-quarter wages). Programs with overall scores of 7-9 "Exceed Expectations," those scoring 6 "Meet Expectations," and scores of 3-5 are classified as "Below Expectations."

This rating system provides a conservative, flexible approach to evaluating program performance by accommodating data variability and adjusting for external factors.