

The Role of Vocational Training in Reducing Unemployment Rate in the Outlying States of United States of America

Abstract

This paper analyses the contribution of vocational training in reducing the unemployment rate in Guam, the Commonwealth of Northern Mariana Islands (CNMI), American Samoa, and the U.S. Virgin Islands. All of these areas are located in the Pacific Ocean near South East Asia, with the exception of the U.S. Virgin Islands. The data in this study was pulled from the U.S. Census data in 2000 and 2010. This was a quantitative study using a logistic regression method to predict the likelihood of unemployment rate changes between 2000-2010, with the dependent variable being the change of the unemployment rate between 2000-2010 and the independent variable being the percentage of people completing vocational training. The findings show that the percentage of people in the age groups of 16-44 and 45-64 who completed vocational training correlate to declining unemployment rates. This paper illuminates the role of vocational training programs in reducing the unemployment rate in U.S. territories in the Pacific region and in the U.S. Virgin Islands. These results encourage further research that examines training in the workplace through work integrated learning, with work policies widening access to quality vocational education and training programs.

Key words: *vocational training program, unemployment rate, work-integrated learning, logistic regression*

1 Introduction: Vocational Education in the U.S. Outlying States

1.1 Background

The unemployment rate soared due to declining economic conditions in the United States in 2008, with different levels of severity among regions and states. The U.S. economy entered a severe recession with eighty-two percent of the U.S. counties experiencing job losses (Hertz, Kusmin, Marré & Parker 2014). The unemployment rate is an important issue for the U.S. economy in general. After the economic recession in 2008, the U.S. economy continues to make great strides toward reducing unemployment caused by the recession.

After the global recession, the U.S. government made concerted efforts to eradicate the unemployment rate and resume growth. Improving the education sector, especially the vocational education and training, was one of the measures taken to contribute to U.S. workforce development. The U.S. government has provided various programs to create cooperation between the workforce and the training conducted by the Department of Labor, the Department of Education, and various stakeholders such as Association of Career and Technical Education. For example, the Workforce Investment Act (WIA) Title I Adult provides training for dislocated worker and youth. There are six core programs under the act,

namely the Adult Program, the Dislocated Worker Program, the Youth Program, the Adult Education and Literacy Program, the Wagner-Peyser Act Program and the Vocational Rehabilitation Program.

1.2 Problem Statement

1.2.1 Significance of the Problem

This study examined the relationship between the unemployment rate and education, particularly vocational (career and technical) education and training. The main purpose of this paper is to analyze the determinants of unemployment rate change by focusing on the role of education and training.

1.2.2 Significance of the Study Area

When discussing the unemployment rate, the United State primarily focuses on the fifty states in the mainland, not on the outlying territories in the Pacific region. Only a handful of publications about this region were found pertinent; the region remains severely understudied. This study, however, focused on four outlying territories: Guam, Commonwealth Northern Mariana Islands (CNMI), American Samoa, and the Virgin Islands. Three of these territories are located the Pacific Ocean near South East Asia except for the Virgin Islands.

This study focused on examining the contribution of vocational training in reducing the unemployment rate in outlying areas of the U.S., which are the only Census Designated Places (CDP) in the U.S. census that record the vocational training received by their population.

Because this study focused on these regions, this research contributes to the current gap in the literature about vocational education in the United States as well as the Asia Pacific Region. This study aims to shed some light on vocational training's role in combating rising unemployment rates in these regions.

1.2.3 Research Question

The research question of this study was: *“Is the unemployment rate between 2000-2010 in U.S. outlying regions affected by vocational training?”* This study hypothesized that if there is a higher percentage of people of a certain population in the labor force who have completed vocational training then the unemployment rate of this population decreases. The study argues that the completion of vocational training equips participants with the occupational skills needed for employment and does, in fact, contribute to the unemployment rate.

1.3 Structure of the Paper

This paper consists of five sections, starting with the “Introduction,” which gives an overview of the study. The “Literature Review” section reviews the methods and findings of similar studies that have been conducted. The “Data and Methods” section describes the data source,

the method for data collection, and the data analysis method to address the relationship between dependent and independent variables. The “About Methods” section explains the logistic regression method. The “Results” section presents the statistical results of this study. The “Discussion” section summarizes and discusses the findings in relation to broader perspectives. The “Conclusion” presents the contributions, acknowledges the limitations, and proposes future avenues of research.

2 Vocational Training in the U.S. Outlying Territories in Pacific Region

2.1.1 Workforce in the U.S. Outlying States

The workforce in these U.S. outlying territories is recovering from an increasing unemployment rate due to the global economic recession, all facing the downturn of the hospitality industry after 9/11. Civilian job sectors comprise of agriculture/fishing, construction, trade, manufacturing, transportation, finance, art/entertainment industry, education services, and public administration. The armed forces are a major employer since U.S. military bases are located in these islands in Pacific region. The case study areas are small islands which are relatively isolated from inland migration from other states. Except for the U.S. Virgin Islands, all of the case study areas are categorized as Pacific Islands.

2.1.2 Vocational Training in the U.S. Outlying Territories

Formal vocational education and training in the regions studied was administered by the Department of Education, the Department of Labor, and vocational training conducted by workplaces in cooperation with the Association of Career and Technical Education. For the youth preparing to enter the workforce, vocational education was offered by the secondary institutions and youth activity programs through the policies of the Workforce Investment Act (WIA) Title I Adult. (United States Department of Labor 2008). The core programs under the act aim at providing the population with the skills to participate in the workforce. For adult workers and those affected by the economic recession, there are adult programs, dislocated worker programs, adult education and literacy programs, and vocational rehabilitation programs.

Career networks in Guam, CNMI, American Samoa, and the Virgin Islands have initiated efforts to combat unemployment through the provision of vocational training by eligible service providers (ESP). This service was provided under the WIA of 1998, which offered more ESP and a variety of vocational training in various occupational areas. Additionally, more vocational programs for adults and dislocated workers were initiated in in 2001. Other programs promote skills for youth in the form of comprehensive guidance and counselling, tutoring, and study skills training. These programs include supportive services such as leadership development opportunities. Those outlying areas, except the Virgin Islands, were aided by the Association of Career and Technical Education (ACTE). ACTE provides the labor force with professional development, leadership, and legislative advocacy. This region

of ACTE serves career and technical education communities in Guam, Central North Mariana Islands, Palau, and American Samoa (Association for Career and Technical Education 2017).

2.1.3 Vocational Training and Its Impact on Employment

In the U.S., a handful of studies have examined the nexus between unemployment and vocational training. For instance, an article published in *Journal of Vocational Education Research* titled “Work Experience in Adolescence” indicates that completing a secondary vocational education program can result in positive outcomes in school, including lowered dropout rates. In a working environment, such training can improve employee attitudes toward work, resulting in lower unemployment and higher pay (Mortimer 1994). Other research focuses on participation in secondary vocational education and how it positively affects the occupational experiences and work aspirations of adult workers in these programs (Stone 1988).

Previous studies show that changes in the educational attainment of the U.S. labor force affect aggregate labor market outcomes, such as the unemployment rate (Daly, Jackson & Valletta 2007). One study, published in the *FRBSF Economic Review*, concludes that workers with a college education face a sharper trade-off between labor market tightness and wage growth than do other educational attainment groups. Other studies point to socio-economic status as one of the factors affecting the likelihood of unemployment, indicating that lower-income adults are the least likely to be employed (Kablaoui & Paulter Jr. 1991).

Vocational education and training tailored to the needs of the labor market can affect economic productivity. Vocational education and training paths combine general skills with occupation skills to promote a smooth transition to the labor market and avoid youth unemployment (Biavaschi et al. 2012). In general, in OECD countries youth unemployment is two to four times higher than adult unemployment. Vocational training also benefits the unemployed who are working age (Hirshleifer, McKenzie, Almeida, & Ridao-Cano 2014). However, impacts lasted only three years after training.

According to a study published in the *Journal of Vocational Education Research*, a workforce that receives vocational training has a higher likelihood of employment (Rojewski 1997). This study used data from the National Education Longitudinal Study of 1988-1994, tracking individuals who have received a vocational education. Vocational track participants were more likely to be employed than those with limited or no vocational training. Adult workers who were enrolled in a vocational program were more likely to be employed full-time than other adult workers.

3 Data and Methods

This study used quantitative research using the binary regression model to examine the relationship between the unemployment rate and vocational training in various U.S. outlying territories in the Pacific and the U.S. Virgin Islands.

3.1.1 Data Sources

Data for this study was pulled from the U.S. Decennial Census data for the year of 2000 and 2010. (United States Census Bureau 2010). The year of 2000 provides the data before the U.S. economic recession (2007), while the data of 2010 demonstrates the recovery progress up until that year.

The data for calculating the unemployment rate change was collected by harnessing data on the labor force, employment rate, and unemployment rates for both years. The data gathered considered population changes and job opportunities in all industrial sectors in 2000 and 2010. Data about the number of people who completed vocational training per age group (16-24, 25-44, 45-64, >65 years old) was also gathered. Data about a population's education attainment (high school diploma or less, associate degree or some college, and bachelor degree) was also a considered variable of education.

3.1.2 Sampling and Unit of Analysis

The geographic scope of this study was four outlying territories, which contain 98 samples (census tracts as the unit of analysis), using census data from 2000 and 2010—Guam: 38 census tracts, Virgin Islands: 26 census tracts, American Samoa: 17 census tracts, and Northern Mariana Islands: 17 census tracts. Those 98 census tracts were given a dummy code to indicate their respective region.



Figure 1: Location of study (Source: Wikipedia)

3.1.3 Variables

This study defined its dependent variable as the unemployment rate change between 2000-2010. The unemployment rate was defined as the percentage of the labor force that was unemployed. To measure the unemployment rate change between 2000-2010, the unemployment rate in 2000 and 2010 was calculated for each census tract. The unemployment rate in 2010 was subtracted by the unemployment rate in 2000 to get the unemployment rate change between 2000 and 2010. For binary logistic regression, the unemployment rate was recoded to binary code (0, 1). Unemployment rate change was considered decreasing ($y=1$) if the unemployment rate change was a negative value.

Unemployment rate change was categorized as increasing ($y=0$) if the unemployment rate change was a positive value.

$$y_i = \begin{cases} 1, & y_i < 0, & \text{if the } i\text{-th unemployment rate change between 2010 - 2000 is less than 0} \\ 0, & y_i \geq 0, & \text{if otherwise} \end{cases} \quad (1)$$

The independent variables were population change, job opportunity, vocational training, education attainment, the categorical variable of census tract location (urban=0 and rural=1), and the categorical dummy variables. Among the major factors affecting unemployment rate were population growth and labor force growth. All percentage job opportunities in all sectors were summed for each year (2000 and 2010), then the delta between those years was taken as a variable of job opportunity change. These factors were incorporated in this study as additional variables affecting unemployment rate change. Populations participating in vocational training were monitored in the case study areas, and their status of completion was recorded in census data. This data was also considered an independent variable.

Table 1: **Description of variables**

Variable	Description	Type of data	Coding
chg_unemp_00_10	Unemployment rate change between 2000-2010	dichotomous	0 or 1
pct_pop_chg	Percentage of population change from 2000-2010	continuous	
pct_chgjob_00_10	Percentage of job change from 2000-2010. Number of jobs is calculated by summing up total number of jobs in all job sectors	continuous	
pctvoctrain_16_44	Percentage of people (aged 16-44yr) completed vocational trainings	continuous	
pctvoctrain_45_64	Percentage of people (aged 45-64yr) completed vocational trainings	continuous	
pct_educ_HSless	Percentage of people with educational attainment high School or less	continuous	
pct_educ_collass	Percentage of people with educational attainment associate degree	continuous	
pct_educ_bach	Percentage of people with educational attainment bachelor degree or more	continuous	
urb_rur	Categorical variable of whether the census tract is categorized as urban or rural area	dichotomous	1=Urban 0=Rural
dummy_1	Dummy variables are indicating census tracts' belonging to certain state category. Guam is the reference group.	dichotomous	1=Virgin, 0=others
dummy_2			1=Samoa 0=others
dummy_3			1=Mariana 0=others

3.1.4 *Logistics Regression Method: Binary Logit*

The logistic regression method was used as a tool of analysis. The dependent variable was a binary choice; either unemployment rate change equals to 1 (URC decrease) or 0 (URC increase). The binary logit mathematical equation can be expressed as *log of the odds*

(equation 2) or *the ratio of the odds*. The formula of *log odds* and *odds ratio* can also be converted to find the *probability of unemployment rate decline*, $y=1$ (equation 3).

$$y_i = \begin{cases} 1, & y_i < 0, \\ 0, & y_i \geq 0, \end{cases}$$

$$\log \left(\frac{\text{odds } y_i=1}{\text{odds } y_i=0} \right) = x_i \beta \tag{2}$$

$$\left(\frac{\text{odds } y_i=1}{\text{odds } y_i=0} \right) = e^{x_i \beta} \tag{3}$$

Where x_i is a vector of covariates and β is a vector of regression coefficients. This formula of log odds and odds ratio can also be converted to find the probability of unemployment rate decline ($y=1$).

$$\begin{aligned} \log \left(\frac{Y}{1-Y} \right) &= \mathbf{X}\beta \\ \frac{Y}{1-Y} &= e^{X\beta} \\ Y &= (1-Y)e^{X\beta} \\ Y &= e^{X\beta} - e^{X\beta}Y \\ Y + e^{X\beta}Y &= e^{X\beta} \\ (1 + e^{X\beta})Y &= e^{X\beta} \\ Y &= \frac{e^{X\beta}}{1 + e^{X\beta}} \end{aligned} \tag{4}$$

Where x_i is a vector of covariates, β is a vector of regression coefficients, and Y is the probability of unemployment rate change.

Binary logistic regression analysis was applied since the dependent variable had a binary value, either 1 or 0. The odds modelled were the odds of unemployment rate change decline ($y=1$). The *odds ratio* was between *the odds of $y=1$* (unemployment rate decrease) and *the odds of $y=0$* (unemployment rate increase). SAS statistical software was utilized to run the statistical analysis.

The *stepwise model* was performed by gradually incorporating covariates (independent variables) into the model. There were three models developed using binary logistic regression models: Model 1, Model 2, and Model 3. Model 1 was an intercept only model without any independent variables. Model 2 incorporated the variables of population change, job opportunity change, vocational training, and education attainment variables. As a full model, Model 3 was a model which incorporated all of the independent variables with additional dummy variables. The dummy variable regarding whether or not an area was urban or rural was also introduced in order to examine the differences between urban or rural areas. Meanwhile, the dummy variable regarding regions was entered in the model to examine the

regional differences among the territories (Guam=reference, the Virgin Islands= dummy 1, Samoa= dummy 2, CNMI=dummy 3).

The interpretation of the binary logistic regression statistical results was conducted by examining the value coefficient of the *log of the odds* and *odds ratio* (Liao 1994). Changes in the model fit (as indicated by the values of *-2 Log Likelihood*, *AIC*, and *SC*) were observed as the covariates. The values of *-2 Log Likelihood* between Model 1, Model 2 and Model 3 were compared. The Chi-square test was conducted to examine the statistical significance of model improvement by incorporating more covariates in the model.

4 Results

4.1 Descriptive Statistics

Table 2: Descriptive statistics of variables

Variable name	Variable code	Mean	Standard Deviation
Unemployment rate	chg_unemp_00_10	0.449	0.500
Population change	pct_pop_chg	3822.310	37373.90
Job opportunity change	pct_chgjob_00_10	21.829	125.634
Vocational training	pctvoctrain_16_44	13.754	6.026
	pctvoctrain_45_64	9.101	2.684
Education attainment	pct_educ_HSless	59.176	18.432
	pct_educ_collass	26.183	8.748
	pct_educ_bach	19.745	9.049
Urbanized area	urb_rur	0.898	0.304
Regional effect	dummy_virgin	0.265	0.444
	dummy_samoa	0.173	0.381
	dummy_mariana	0.173	0.381

4.2 Binary Logistics Regression Statistical Results

Caution must be taken when interpreting the logistic regression results, as the interpretation was different from the more commonly used ordinary least-square regression (OLS) model.

When interpreting the results, researchers paid attention to the odds ratio value of variables, the significance level of the log odds coefficient, and the model fit indicators (*-2 Log Likelihood*, *AIC*, and *SC*). The statistical results of binary logit regression models are depicted in Table 3.

Table 3: Binary logit model result

Parameter	Model 1		Model 2			Model 3		
	Coeff. of log odds	Stand. Error	Coeff. of log odds	Standard Error	Odds Ratio	Coeff. of log odds	Standard Error	Odds Ratio
Intercept	-0.2048	0.2031	-16.2562	69.9124		-10.9425	125.5000	

	Model 1		Model 2			Model 3		
Parameter	Coeff. of log odds	Stand. Error	Coeff. of log odds	Standard Error	Odds Ratio	Coeff. of log odds	Standard Error	Odds Ratio
Population change variable								
pct_pop_chg			0.0000	0.0001	1.000	-0.0001	0.0002	1.000
Job Opportunity								
pct_chgjob_00_10			0.0026	0.0021	1.003	0.0015	0.0064	1.001
Vocational variable								
pctvoctrain_16_44			0.1912**	0.0674	1.211	0.5457*	0.2194	1.726
pctvoctrain_45_64			0.2452**	0.1083	1.278	0.6275*	0.3091	1.873
Education variable								
pct_educ_HSless			0.1178	0.6989	1.125	0.2110	1.2548	1.235
pct_educ_collass			0.0805	0.6998	1.084	-0.3058	1.2637	0.737
pct_educ_bach			0.1247	0.6997	1.133	0.2081	1.2581	1.231
Dummy variables of location and region								
urb_rur						-5.4984**	2.2824	0.004
dummy_virgin						-9.9394***	2.7799	<0.001
dummy_samoa						-22.0258	206.4000	<0.001
dummy_mariana						-7.4153***	1.9841	<0.001
Model fit indicators								
AIC						62.4580		
SC						93.4780		
-2 Log Likelihood						38.4580		
R-Square						0.6260		

Model 1 was an intercept only model, which did not incorporate any covariates. This was the coefficient for the constant, when not all independent variables are entered into the equation or when all covariates are zeros. In this model, the intercept was not statistically significant.

Model 2 introduced independent variables pertinent to population change, job opportunity change, vocational training, and education attainment into the stepwise model. The result shows that for each one-unit increase in the percentage of people (aged 16-44) who completed vocational training, the odds ratio of unemployment rate change decline ($y=1$) compared to unemployment rate change increase ($y=0$) is increased by a multiplicative factor of 1.21 ($\exp 0.1912$). It is statistically significant at the level of $p<0.01$. For each one-unit increase in the percentage of people (aged 45-64) who completed vocational training, the odds ratio of unemployment rate change decline (URC decline) is increased by a multiplicative factor of 1.27 ($\exp 0.2452$) and statistically significant. The value of *-2 Log Likelihood* declines when the covariate is entered into the model, from 134.835 to 109.848.

Model 3 was the full model, with the additional dummy variables entered into the stepwise model, indicating urban/rural category (one dummy variable) and region category (three dummy variables). Guam was the reference group since it had the highest number of samples.

The value of *-2 Log Likelihood* declines when the covariate is entered into the model, from 134.835 to 38.458. For each one-unit increase in the percentage of people (aged 16-44) who completed vocational training, the odds ratio was increased by a multiplicative factor of 1.726 (exponent 0.5457). These results are statistically significant at 0.05 level with a standard error of 0.2194. For each one-unit increase in the percentage of people (aged 45-64) who completed vocational training, the odds ratio (URC decrease compared to URC increase) was increased by a multiplicative factor of 1.873. These results are also statistically significant. Furthermore, the categorical variable of urban or rural are also statistically significant. The odds ratio of URC decrease compared to URC increase is 0.004 times higher for the urban area than for rural area. Using the inverted ratio (1:0.004), it could be interpreted that the odds ratio of URC decrease compared to URC increase was 250 times higher for the rural area than for urban area.

By introducing dummy variables regarding regions, the regional difference of unemployment rate change was examined. Guam was the controlling reference group. The odds of unemployment rate change decline in the Virgin Islands were only 0.000048 times those of Guam. Using inverted ratio (1 / 0.000048), the odds of unemployment rate change decline in Guam was 20.83 times higher than that of the Virgin Islands. Guam had a higher likelihood of unemployment rate decline compared to Northern Mariana. Interpreted using an inverted ratio, the odds of unemployment rate change decline in Guam was $1 / 0.0006 = 1.66$ times higher than that of Northern Mariana.

Pearson Chi-square analysis showed the statistically significant result when *crosstab analysis* was performed between the unemployment rate change and the four regions. 87% of census tracts in Guam experienced unemployment rate decline from 2000-2010, while in the Virgin Islands the percentage is 38% and 12% in the Commonwealth of Northern Mariana.

The independent variables of the percentage of people completing vocational training were statistically significant in both Model 2 and Model 3. The result presented in this section correspond to the research hypothesis. This study found that the percentage of people (age group of 16-44 and 45-64) completing vocational training correlates to unemployment rate decline.

5 Findings and Discussions

5.1 Summary of findings

Vocational training contributed to the likelihood of unemployment rate decline in the regions studied. The higher the percentage of people who completed vocational training, the lower the unemployment rate. Vocational training for people aged 45-64 proved to be a higher multiplicative factor in increasing the likelihood of unemployment rate change decline.

Vocational training for the working-age group of 45-64 contributed more to reducing the unemployment rate. Vocational training for this adult group workforce often takes place in

the workplace. The training for the adult working-age group can also take place in the form of a vocational dual-programs at vocational training firms. Work integrated learning (WIL) in the workplace might be a major feature in vocational training for this adult age group. A WIL-concept will require concerted efforts among training providers (ETP), industries (workplaces), local Association of Career and Technology Education agencies (ACTE), government (Department of Labor) and related stakeholders in vocational training for the workforce.

Unemployment in urban areas is different from rural areas. The odds ratio of URC decrease compared to URC increase is 250 times higher for rural areas than for urban areas. This result conforms to the study conducted by Hertz et al. (2014) affiliated with the United States Department of Agriculture, which states that rural areas are less affected by employment losses and unemployment increases. The job opportunity sector in rural and urban areas is different. Rural areas provide fewer positions in the manufacturing industry sector that suffered most rapid job losses during the recession. Rural areas also had higher shares of farm/agricultural industry jobs and federal jobs, which were less affected by the recession.

There are enormous regional differences in the unemployment rate change decline in the Virgin Islands compared to Guam, as well as a between Northern Mariana and Guam. The different territories possess different characteristics of unemployment rate change compared to Guam. This result adheres to the research result of USDA (Hertz et al. 2014), which indicates that there is geographic variation in both the (un)employment effects of the recession and the pace of job growth during the recovery, with large differences between the regions. This geographic variation is affected by differences in the mix of industries in each territory's local economy, population growth trends, and local workforce demographic.

5.2 Labor and Vocational Education Policy Implications in the Study Areas

The results of this study have policy implications for the continuation and improvement of vocational programs from the U.S. Department of Labor. Vocational training programs in the regions studied can equip the labor force with necessary vocational skills. The U.S. Department of Education, with the enactment of the Perkins Act, plays an important role. Vocational training in both working-age groups contributes to unemployment rate decline. The Carl D. Perkins Vocational and Technical Education Act (Perkins III) exemplifies federal efforts to improve the vocational program availability, as well as to improve the quality of vocational programs (Bottoms 2017).

5.3 Relation of This Study to Asia Pacific Region

Developing-countries in the Asia Pacific can relate to the findings of this study. Vocational training contributes to workforce readiness and increases the likelihood of employment. Thus, the unemployment rates in developing countries will decline as a consequence.

6 Conclusion

This study answers the research question regarding vocational training and unemployment rate decline between 2000 and 2010. Vocational training contributes to a decline in the unemployment rate in the regions studied. The higher the percentage of people who completed vocational training, the lower the unemployment rate.

The study also highlights the differences between unemployment rates in urban and rural areas. The regional difference of unemployment rate change between regions also indicates that each territory possesses a distinct local economy.

6.1 Limitations

This study indicates that the vocational training for the age group 16-44 significantly affects the decline of unemployment rate change. Therefore, this study also infers the importance of reducing youth unemployment. However, unemployment data in this study was not based on age group. Due to this data limitation, this research could not address specific types of youth unemployment. Another limitation is that the independent variable of job changes (2000-2010) was calculated cumulatively (total jobs in all job sectors). Based on the findings, there is a significant difference of unemployment rate change between urban and rural areas due to their specific job sectors.

Additionally, there was a caveat when the percentage of people who complete vocational training is interpreted as the independent variable in this study. Determining which types of vocational training contributes the most to unemployment rate reduction still needs to be further clarified. Student participation in vocational education varied, from taking a single-course to completing multiple programs (Grubb & McDonnell 1991). In the dataset used, all programs were given equal weight.

6.2 Recommendation for Further Research

Despite its limitations, this paper clarifies the role of vocational training programs in reducing the unemployment rate in understudied territories in the U.S. For further research, it would be interesting to examine unemployment based on age group. Another promising avenue of research is examining job changes in specific sectors (agricultural/fishing, hospitality/service, trade, etc).

Since vocational training for the age group 44-65 is more likely to be conducted in the workplace, further examination about the work integrated learning (WIL) and its contribution to the adult workforce would be another interesting avenue for further research.

Overall, the results and recommendations of this study can be beneficial for strengthening the labor force and for continuing the great strides the U.S. has already taken in reducing the unemployment rate and recovering the economy. Perkins III programs are an example of

federal efforts to improve the availability of vocational programs, as well as to improve the quality of vocational programs in the regions studied and in the U.S.

Acknowledgement

The author would like to thank Dr. JiYoung Park and Harold Ha Hwang (SUNY Buffalo, Department of Urban and Regional Planning) for guidance and feedback during the research, design, and writing process.

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TVET@asia The Online Journal for Technical and Vocational Education and Training in Asia

CITATION:

Saleh, I. (2017). The role of vocational training in reducing unemployment rate in the outlying states of the United States of America. In: TVET@Asia, issue 9, 1-14. Online: http://www.tvet-online.asia/issue9/saleh_tv9.pdf (retrieved 30.06.2017).

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