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Analysis of the Effect of Labor Force Participation Rate and Years of Education on Open Unemployment Rate: A Study on Human Resource Management in Lampung Province

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ABSTRACT
This study aims to examine the influence of the Labor Force Participation Rate (LFPR) and average years of education on the Open Unemployment Rate (OUR) in Lampung Province, Indonesia, within the framework of human resource management. Utilizing multiple regression analysis on secondary data from official sources, the research assesses both partial and simultaneous effects of LFPR and education on unemployment. The findings reveal that LFPR negatively and significantly affects OUR, where a one-unit increase in LFPR reduces unemployment by 0.244 units (p = 0.006). Conversely, the average years of education show a positive and significant correlation with unemployment, with each additional year increasing OUR by 0.702 units, indicating a mismatch between educational output and labor market demand. The model explains 62.8% of the variation in unemployment rates, highlighting the complex dynamics of workforce participation and education on employment. This study underscores the critical need for aligning educational curricula with market requirements and improving job readiness to effectively reduce unemployment. The results offer valuable insights for policymakers and human resource managers aiming to optimize labor productivity and address unemployment challenges in developing regions.

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Introduction

In Lampung Province, as in many other regions in Indonesia, open unemployment is one of the main issues that must be faced in an effort to accelerate economic development. This issue is often influenced by various factors such as limited job opportunities, skills that are not in line with market needs, and inadequate education levels (Frisnoiry et al., 2024; Widodo & Anwar, 2024). A high unemployment rate can lead to an increase in the poverty rate, social instability, and reduce the quality of life of the community (Minadi et al., 2024). Open unemployment is a condition in which individuals who are included in the labor force are actively looking for work but have not succeeded in getting it (Rahman & Riani, 2023; (Sari et al., 2024). According to Sukirni (2013), in (Utami et al., 2025) Open unemployment includes people who are actively looking for work, are planning a business,

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do not have a job at all, are not looking for work because they feel there are no job opportunities, and those who have a job but have not started working. Usually, open unemployment occurs because the number of labor force or job seekers exceeds the number of available jobs and is unable to absorb them.

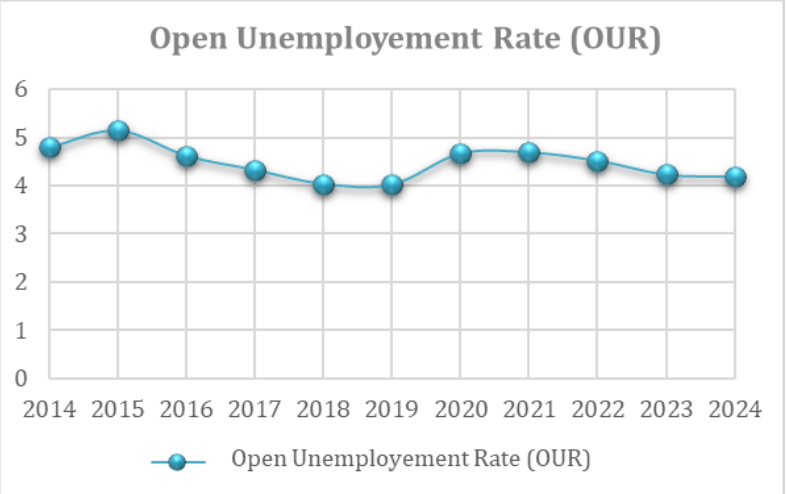

Figure 1. Open Unemployment Rate of Lampung Province 2014-2024 Period

Based on Figure 1, in accordance with data from the Central Bureau of Statistics (BPS). Lampung Province has experienced changes in the open unemployment rate over the past decade. In 2015, the open unemployment rate reached 5% of the labor force level. This trend experienced a gradual decline until it reached a low point of 4.03% in 2019. However, after reaching this low point, there was a slight increase in the following years, with the OUR reaching 4.19% in 2024, indicating that the dynamics in the labor market are constantly changing and require adaptive policies.

One important indicator that affects the unemployment rate is the Labor Force Participation Rate (LFPR). The Labor Force Participation Rate (LFPR) is a measure used to show the proportion of the working-age population that is actively engaged in the labor market, both those who are already working and those who are looking for work. It is an important indicator to understand labor market conditions in a region (Matondang et al., 2024; Ningsih et al., 2024). LFPR is calculated as the percentage of the total working age population who are actively in the labor force (working or looking for work) to the total working age population (Sianturi et al., 2024).

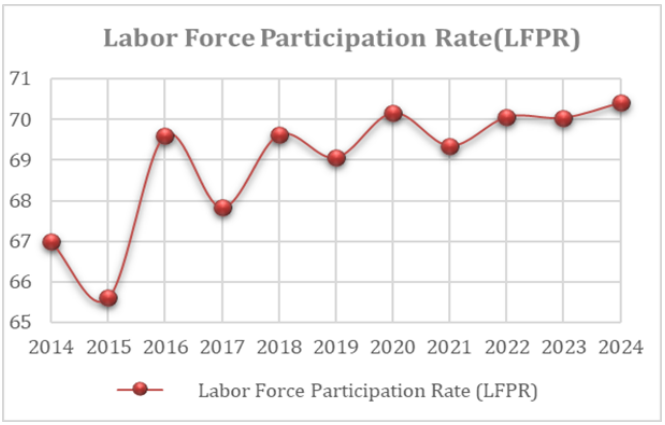

Figure 2. Labor Force Participation Rate of Lampung Province 2014-2024 Period

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Based on Figure 2, according to data from the Central Bureau of Statistics (BPS). Over the past decade, Lampung Province has witnessed dynamic changes in LFPR. Starting in 2014, the LFPR stood at 66.99%, signaling a fairly high engagement in the labor market. This dynamic trend continued until 2024, with LFPR increasing to 70.41%. This increase reflects the success of various programs and policies implemented to increase labor force participation in Lampung Province, as well as the community's adaptation to changing economic conditions

The effect of the Labor Force Participation Rate (LFPR) on the Open Unemployment Rate (OUR) can be seen from various aspects. When the LFPR increases, more people enter the labor market and look for work. If job creation is not in line with the increase in the number of workers, the OUR tends to increase because more people looking for work are not absorbed by the job market (Putri et al., 2024). Conversely, if LFPR declines, it could indicate that many people are leaving the labor force, which might lead to a decline in OUR, indicating unhealthy labor market conditions. However, an increasing LFPR can also cause the OUR to decline in a situation where increased labor force participation is accompanied by sufficient job creation. When the government and the private sector succeed in creating more job opportunities that match the skills and qualifications of the workforce, an increase in LFPR can go hand in hand with a decrease in OUR (Nurteta, 2021). This shows that the labor market is able to absorb the additional labor force effectively.

In addition to the level of labor force participation, another indicator that is often considered to affect the open unemployment rate is education, but it is not always the main determinant. This is due to rising expectations among individuals with higher education. They often feel that the salary offered is not proportional to their qualifications, so they choose to be temporarily unemployed until they find a job that offers wages in accordance with their level of education (Siskawati et al., 2021; Salsabila et al., 2022). In addition, skill mismatch is one of the main reasons, where graduates with higher education may not have skills that match the needs of the job market. varying education quality also affects the unemployment rate, where graduates from less qualified educational institutions may not have adequate competencies (Riya et al., 2024). Another factor is the limited number of jobs available, which leads to a disproportionate number of graduates with existing job opportunities.

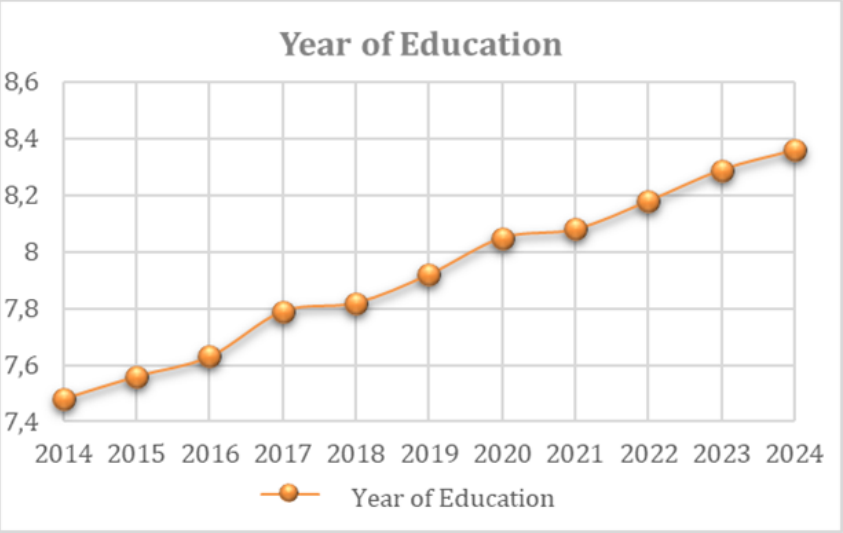

Figure 3. Years of Education in Lampung Province 2014-2024 Period

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Based on Figure 3, in accordance with data from the Central Bureau of Statistics (BPS). Over The past ten years, Lampung Province has recorded a steady increase in the average years of education of its population. In 2014, the average years of education stood at 7.48 years, indicating that the population generally completed around seven and a half years of formal education. This development has continued each year. In 2015, the year of education increased to 7.56 years and continued its gradual increase until it reached 8.36 years in 2024. By the end of this period, the average year of education shows that many residents have achieved an education level equivalent to eight years or more, illustrating progress in education. In addition, this increase also shows the adaptation of society to the importance of education in improving the quality of life and opening up better economic opportunities.

This educational improvement raises critical questions regarding its impact on labor market dynamics, particularly the unemployment rate. Understanding this relationship is essential for policymakers aiming to design effective strategies for workforce development and economic resilience.

Method

This study employs a quantitative explanatory research design with a longitudinal time-series approach. The objective of this design is to examine the influence of the labor force participation rate and average years of education on the open unemployment rate (OUR) in Lampung Province over time. Quantitative methods are deemed appropriate for systematically analyzing numerical data to identify causal relationships between variables (Simorangkir et al., 2024).

Data Collection Technique

The study utilizes secondary data spanning from 2014 to 2024, obtained from the Central Bureau of Statistics (BPS) of Lampung Province and other relevant sources. The data are organized in a time-series format with annual observations. A documentation technique was employed to systematically compile the data into structured tables suitable for analysis (Sulung & Muspawi, 2024). All variables are defined according to official statistical standards as follows:

1. Open Unemployment Rate (Y): The percentage of the labor force that is unemployed.
2. Labor Force Participation Rate (X1): The percentage of the working-age population actively engaged in the labor force.
3. Years of Education (X2): The average number of years of formal education completed by the population.

Hypothesis Development

This study formulates hypotheses to examine both the simultaneous and partial effects of Labor Force Participation Rate (LFPR) and Years of Education (YoE) on the Open Unemployment Rate (OUR) in Lampung Province using multiple linear regression analysis.

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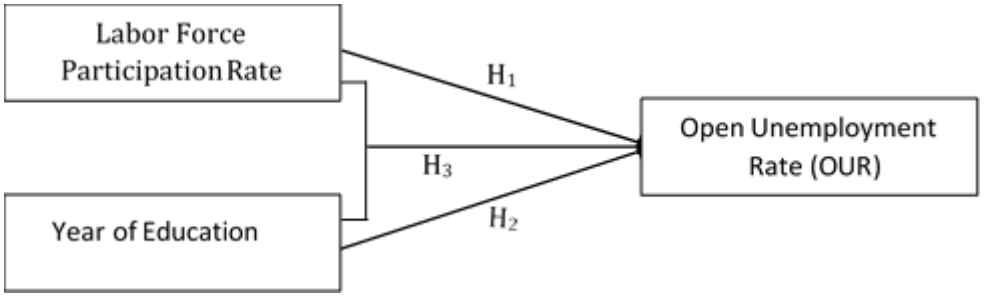

Figure 4. Conceptual Framework and hypothesis

Simultaneous Hypothesis (F-test)

a. Null Hypothesis (H_0): LFPR and YoE have no simultaneous effect on OUR ($\beta_1 = \beta_2 = 0$).
b. Alternative Hypothesis (H_1): LFPR and YoE have a simultaneous effect on OUR (at least one $\beta \neq 0$).

The simultaneous effect is tested by the F-statistic. A significant F-test (p-value < 0.05) indicates that together LFPR and YoE significantly influence the unemployment rate.

Partial Hypotheses (t-test)

For LFPR:

a. H_0: LFPR has no effect on OUR ($\beta_1 = 0$)
b. H_1: LFPR has an effect on OUR ($\beta_1 \neq 0$)

For Years of Education:

a. H_0: YoE has no effect on OUR ($\beta_2 = 0$)
b. H_1: YoE has an effect on OUR ($\beta_2 \neq 0$)

Data Analysis Technique

The data were analyzed using multiple linear regression, processed through IBM SPSS Statistics version 26.0. This method was selected to evaluate the simultaneous influence of the independent variables (X_1 and X_2) on the dependent variable (Y). The general regression model applied in the analysis is expressed as follows: (Syamil et al., 2023).

$$Y = a + \beta 1X1 + \beta 2X2$$

Information:

Y = Open Unemployment Rate
a = constant
β1, β2= Regression coefficient
X1 = Labor Force Participation Rate
X2 = Years of Education

Findings

Data Normality Test

The results of the normality test, presented in Table 1, demonstrate that the p-value (Asymp. Sig. 2-tailed) is 0.146. This value exceeds the standard significance threshold of 0.05, indicating insufficient evidence to reject the null hypothesis that the residual data are

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normally distributed. The mean of the unstandardized residuals is approximately zero, with a standard deviation of 0.274, suggesting that the residuals are centered and exhibit moderate dispersion around the mean.

Additionally, the Kolmogorov-Smirnov test statistic is 0.219, with the largest absolute deviation recorded at 0.219. Given that the p-value surpasses 0.05, it can be concluded that the residuals satisfy the normality assumption required for parametric statistical techniques. Therefore, the data fulfill the essential condition of normality, validating the use of subsequent inferential analyses based on these residuals.

Table 1. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		11
Normal Parameters[a,b]	Mean	0.0000000
	Std. Deviation	0.27362914
Most Extreme Differences	Absolute	0.219
	Positive	0.140
	Negative	-0.219
Test Statistic		0.219
Asymp. Sig. (2-tailed)		0.146[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.
Source: Data analysis 2025

Data Multicollinearity Test

Table 2. Multicollinearity

	Collinearity Statistics	
Model	Tolerance	VIF
1 (Constant)		
LFPR	0.539	1.854
Years of Education	0.539	1.854
	Free Multicollinearity	Free Multicollinearity

a. Dependent Variable: OUR
Source: Data analysis 2025

The multicollinearity analysis in Table 2 shows Tolerance values of 0.539 and VIF values of 1.854 for Labor Force Participation Rate (LFPR) and Years of Education, which exceed and fall below the commonly accepted thresholds of 0.1 and 10, respectively. This indicates no significant multicollinearity between the independent variables. Therefore, both variables can be reliably included in the regression model without risk of distortion due to predictor correlations, making the model suitable for further analysis.

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Heteroscedasticity Test

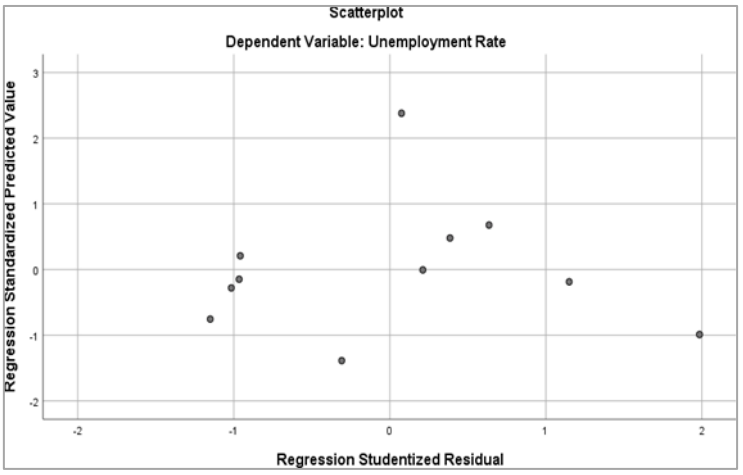

Figure 4. Scatter Plot of Unemployment Rate

The results of the heteroscedasticity test in Figure 4, shows a scatter plot between the residuals and predicted values. In the scatter plot, the points are scattered randomly around the horizontal line without showing a clear pattern. This indicates that the residual variance is constant, which means there is no heteroscedasticity problem in this regression model. Thus, the assumption of homoscedasticity is met, which ensures that the regression model is valid and the estimation results are reliable. The absence of a systematic pattern in the scatter plot indicates that the residual variance does not change with the predicted value, strengthening the validity of the regression analysis.

Descriptive Data Test

The analysis of the research data provides descriptive insights into the studied variables, namely the Labour Force Participation Rate (LFPR), Years of Education, and Open Unemployment Rate (OUR). The data are presented in a descriptive statistical format that includes the minimum, maximum, total sum, mean, standard deviation, and variance values for each variable. This presentation aims to offer a general overview of the dataset's characteristics prior to conducting further inferential analyses.The descriptive results indicate that LFPR values range from 65.60 to 70.41, with a mean of 68.98 and a standard deviation of 1.53. The average years of education range between 7.50 and 8.31, yielding a mean value of 7.92 with a standard deviation of 0.34. Meanwhile, the open unemployment rate varies from a minimum of 4.03 to a maximum of 5.14, with an average of 4.48 and a standard deviation of 0.35. The relatively low variance values for each variable suggest a limited degree of dispersion, indicating that the data points do not exhibit high variability within the sample (N = 11).

Table 3. Descriptive Statistics

	N	Min	Max	Sum	Mean	Std. Deviation	Variance
LFPR	11	65.60	70.41	758.73	68.9755	1.52918	2.338
Years of Education	11	7.50	8.31	87.16	7.9236	0.33826	0.114
OUR	11	4.03	5.14	49.25	4.4773	0.34615	0.120
Valid N (listwise)	11						

Source: Data analysis 2025

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Multiple Linear Regression Test

Table 4 shows a correlation coefficient (R) of 0.793, indicating a strong relationship between the independent variables—Labor Force Participation Rate (X_1) and Years of Education (X_2)—and the dependent variable, Open Unemployment Rate (Y). The coefficient of determination (R^2) of 0.628 suggests that 62.8% of the variance in the unemployment rate is explained by the model, highlighting the significant influence of LFPR and Years of Education. The Adjusted R^2 of 0.535 accounts for the number of predictors, providing a more precise measure of the model's explanatory power. Additionally, the standard error of estimate at 0.23601 reflects a reasonable level of prediction accuracy between observed and predicted OUR values.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.793[a]	0.628	0.535	0.23601

a. Predictors: (Constant), Years of Education, LFPR
b. Dependent Variable: OUR
Source: Data analysis 2025

The ANOVA test results in table 5 show the Sum of Squares for regression is 0.753 with two degrees of freedom (df) which results in a Mean Square of 0.376. The F test shows a value of 6.756 with a significance (Sig.) of 0.019. It can be explained that a significance value of less than 0.05 indicates that this regression model is statistically significant. The Sum of Squares for the residuals is 0.446 with eight degrees of freedom, resulting in a Mean Square of 0.056. The total Sum of Squares for the model is 1,198 with ten degrees of freedom. These results indicate that the regression model examining the effect on the dependent variable is significant. This means that the Labor Force Participation Rate (LFPR) and Years of Education have a significant effect on the Open Unemployment Rate (OUR).

Table 5. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.753	2	0.376	6.756	0.019[b]
	Residual	0.446	8	0.056		
	Total	1.198	10			

a. Dependent Variable: OUR
c. Predictors: (Constant), Years of Education, LFPR
Source: Data analysis 2025

Table 6. Coefficients[a]

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1(Constant)	15.738	3.445		4.568	0.002
LFPR	-0.244	0.066	-1.077	-3.670	0.006
Years of Education	0.702	0.300	0.686	2.336	0.048

a. Dependent Variable: OUR
Source: Data analysis 2025

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The analysis coefficient displayed in Table 6 can be converted into the equation Y=15.738-0.244X1+0.702X2. This multiple regression equation shows that each one-unit increase in the independent variable correlates with the value of the unstandardized coefficient (B). To determine whether the hypothesis is accepted or rejected, the significance value (sig) is compared with the probability of 0.05. The hypothesis is accepted if the significance value is less than 0.05. Conversely, if the significance value is greater than 0.05, the hypothesis is rejected, indicating that the independent variable has no significant effect on the dependent variable.

Discussion

Effect of labor participation rate on open unemployment rate in Lampung Province

Based on the results of data analysis and hypothesis testing, it shows that the Labor Force Participation Rate (LFPR) has a negative and significant influence on the Open Unemployment Rate (OUR) in Lampung Province. The regression coefficient shows that each one-unit increase in LFPR correlates with a decrease in OUR by 0.244 units, with a significance value of 0.006, which is much smaller than 0.05. This indicates that an increase in LFPR is statistically significant in reducing the open unemployment rate. This is in line with the results of study conducted by (Pratama & Idris, 2024) which found that LFPR has a negative and significant effect on the open unemployment rate. The significance of this relationship depends on several factors such as the quality of education, skills training, and the availability of suitable jobs. When more individuals participate in the labor force, the number of people actively seeking employment increases. This indicates that people have the readiness and desire to work, which in turn can lead to an increase in employment.

When this participation is accompanied by relevant skills upgrading and training, individuals are more likely to find jobs that match their qualifications, thereby reducing unemployment. Factors such as stable economic growth, government policies that support vocational training and education, and social and cultural encouragement to work, can also contribute to the decline in unemployment. However, it is important to keep monitoring whether the increase in LFPR is matched by adequate job creation to avoid skill mismatches that could lead to structural unemployment. Thus, the increase in LFPR in Lampung Province has proven to have a positive and significant impact in reducing the open unemployment rate.

Effect of years of education on open unemployment rate in Lampung Province

Based on the results of data analysis and hypothesis testing, it shows that the average year of education has a positive and significant influence on the Open Unemployment Rate (OUR) in Lampung Province. From the regression results, the unstandardized coefficient for years of education is 0.702, which indicates that every one unit increase in years of education correlates with an increase in OUR by 0.702 units. Although this seems counter-intuitive, the findings of this study are in line with Sumarsono's (2015) theory in (Gultom et al., 2024; Sinambela & Wenagama, 2023) which states that education does not guarantee a reduction in unemployment. Although education increases knowledge and skills, there is no guarantee that a job that meets the qualifications will be obtained. This finding is also supported by the results of data (BPS, 2024) August 2024 which reveals that the lowest OUR of 2.10% is in the population with primary school education and below, while the highest OUR is 8.80% at the SMK education level, where the OUR SMK shows an increasing trend in August 2022 of 7.13% to 8.80% in August 2024.

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The complexity of the relationship between education and unemployment is influenced by various factors. Higher education is often not in line with the needs of the labor market, causing a skills mismatch. This makes it difficult for graduates to find suitable jobs, despite their higher education. In addition, an increase in the educated population may lead to an oversupply of educated labor in the local market, increasing unemployment if there are insufficient job vacancies. Individuals with higher education often have higher job expectations, both in terms of position, salary, and working conditions (Isnaini, Nur et al., 2015). When these expectations are not met, they tend to reject available jobs and continue to look for positions that match their expectations. This can temporarily increase the unemployment rate due to the length of time it takes to find a suitable job

Aligning the education curriculum with labor market needs is a strategic step that can maximize employment opportunities for graduates. When the curriculum is designed with the skills and knowledge required by the industry in mind, graduates will be better prepared to face the world of work (Istiqomah et al., 2024). This is not just about increasing the number of graduates, but about ensuring that they have the practical and relevant capabilities that employers are looking for. In this way, education becomes not only a means to improve theoretical knowledge, but also an effective bridge to enter a dynamic and competitive job market.

The effect of labor force participation rate and years of education on the open unemployment rate in Lampung Province.

Based on the results of data analysis and hypothesis testing of the combined effect of Labor Force Participation Rate (LFPR) and years of education on the Open Unemployment Rate (OUR), it shows that about 62.8% of the variation in the OUR can be explained by the model that includes LFPR and years of education as independent variables. This indicates that both factors significantly contribute to changes in the open unemployment rate. Increasing labor force participation accompanied by improving the quality of education can help balance and even jointly contribute to the reduction of open unemployment. Integrating labor force participation and education improvement may increase job opportunities among educated workers, which may make them more selective in accepting jobs. In the long run, a more educated workforce is likely to be more adaptable and find jobs that match their qualifications. Effective Human Resources Management (HRM) is critical in that good HRM involves strategies to increase labor force participation and align skills acquired through education with labor market needs (Handayani, 2024). This includes policies that ensure the skills taught in educational institutions are relevant to industry demand, as well as training programs that match technological developments and market needs. A strategy that combines these two factors can ensure that the workforce is not only ready to enter the labor market, but also has skills and knowledge that are relevant to industry demand. In addition, job creation that matches the qualifications of the workforce is also a key factor in overcoming unemployment.

Conclusion

This research highlights the importance of integrating Labor Force Participation Rate (LFPR) and years of education in understanding and addressing the issue of open unemployment in Lampung Province. An increase in LFPR indicates that more individuals are actively seeking jobs or creating jobs, which can directly lower the unemployment rate. However, higher years of education may increase the expectation of employment among the labor force, which may increase open unemployment in the short term.

Although higher education is expected to improve the skills and competitiveness of the workforce, the reality is not always in line with the needs of the labor market. The mismatch between skills acquired during education and industry needs is one of the main causes of unemployment among the educated. Therefore, an effective strategy is to align the education system with labor market needs and create more jobs that match the qualifications of the workforce.

The findings of this study suggest that integrating labor force participation with education improvement can create a strong synergy in reducing the open unemployment rate. This integrated approach is critical to improving the quality and productivity of the workforce, as well as making a real contribution to improving the quality of human resources, community welfare and economic growth in Lampung Province.

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