

Analyzing the Relationship Between Educational Attainment and Unemployment in West Sumatra

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Abstract

This study aims to analyze the differences in the Open Unemployment Rate (TPT) based on education level in West Sumatra Province during the 2020–2025 period, focusing on comparisons between education levels from elementary school down to university to identify patterns, trends, and unemployment dynamics from a macroeconomic perspective. Furthermore, this study examines the development of the TPT at each education level and identifies the level of unemployment vulnerability between highly and low-educated workers, especially in the context of changing economic conditions during the pandemic and post-pandemic. This study also examines the possibility of a mismatch between the education system and labor market needs that could potentially increase unemployment rates. The method used is a descriptive quantitative approach utilizing secondary data from the Central Statistics Agency (BPS) of West Sumatra Province, which is analyzed comparatively to see differences in the TPT between education levels and using trend analysis and simple time series based on two observation periods each year, namely February and August. The results of the study show that the TPT tends to be higher in the middle and high education groups, especially vocational school, diploma, and university graduates, while the low education group has a lower and relatively stable unemployment rate due to the high absorption of labor in the informal sector, so that policies are needed that are able to integrate education with the needs of the labor market.

INTRODUCTION

Unemployment is a central issue in macroeconomics because it reflects an imbalance between labor supply and demand and has direct implications for economic stability and social welfare. High unemployment rates not only result in low household incomes but also have the potential to increase poverty and social inequality if not addressed systematically (Sukirno, 2019). In the context of regional economic development, unemployment is a crucial indicator for assessing the effectiveness of economic policies and the quality of human resource development (Todaro, 2018).

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Education is theoretically viewed as a key instrument for improving workforce quality and reducing unemployment. Through improved education, the workforce is expected to possess higher skills, productivity, and competitiveness, enabling them to be absorbed into the formal labor market (Mankiw, 2020). However, various studies in Indonesia show that increasing educational attainment does not always translate directly into lower unemployment. The phenomenon of educated unemployment is actually increasing, particularly among secondary and tertiary education graduates, due to a mismatch between graduate competencies and the needs of the workforce (Suryahadi, 2020; Kuncoro, 2021).

West Sumatra Province exhibits interesting employment dynamics worth studying. The regional economic structure, still dominated by the primary and informal sectors, results in relatively limited employment for highly educated workers. This situation was exacerbated by the impact of the COVID-19 pandemic in 2020–2021, which suppressed economic activity and narrowed job opportunities, as well as the post-pandemic economic recovery phase, which has not been fully inclusive across sectors (BPS, 2024). Consequently, the Open Unemployment Rate (TPT) in West Sumatra exhibits varying fluctuations when viewed by education level, from elementary school down to university.

Several studies in Indonesia confirm that low-educated workers tend to be more easily absorbed into the informal sector, resulting in relatively low and stable unemployment rates. Conversely, graduates of vocational and higher education face fiercer job competition, especially when formal employment growth does not keep pace with the increase in the number of graduates (Arsyad, 2020; Handayani, 2022). This situation indicates structural issues in the labor market, particularly related to the mismatch between the education system and regional economic needs.

Diagram 1. Open Unemployment Rate (TPT) based on education level in West Sumatra Province.



Sumber: Badan Pusat Statistik (BPS) Provinsi Sumatera Barat pada periode 2020–2025

Based on this description, this study aims to analyze differences in the Open Unemployment Rate (TPT) based on education level in West Sumatra Province during the period 2020–2025. More specifically, this study focuses on identifying unemployment patterns and trends at each educational level and assessing the level of unemployment vulnerability among educated workers compared to those with lower education.

In addition, this study also highlights the influence of dynamic economic conditions, particularly during the pandemic and post-pandemic, on changes in unemployment rates based on education level.

Another focus of this research is to identify indications of a mismatch between educational output and regional labor market needs. Based on these conditions, an

empirical study is needed that can comprehensively and data-drivenly describe differences in unemployment rates by educational level. Therefore, this study uses a descriptive quantitative approach utilizing secondary data from the Central Statistics Agency (BPS) of West Sumatra Province. This approach was chosen because it can provide an objective picture of the patterns and trends of the Open Unemployment Rate by educational level over a specific time period without testing causal relationships (Sugiyono, 2021; Widarjono, 2020). Therefore, this research is expected to provide a comprehensive empirical picture and serve as a basis for formulating more integrated employment and education policies based on labor market needs.

Through descriptive analysis of 2020–2025 data, this study seeks to identify how unemployment dynamics differ across educational groups and how changing economic conditions affect unemployment rates at each educational level. The results are expected to contribute academically to regional macroeconomic studies and serve as a basis for consideration for local governments in formulating more adaptive education and employment policies based on labor market needs (Ministry of Manpower, 2023; Bappenas, 2023).

Based on the above description, this study aims to analyze the differences in the Open Unemployment Rate (TPT) based on education level in West Sumatra Province during the 2020–2025 period. More specifically, this study focuses on identifying unemployment patterns and trends at each educational level, as well as examining the level of unemployment vulnerability among educated workers compared to those with low education. Furthermore, this study highlights the influence of dynamic economic conditions, particularly during the pandemic and post-pandemic, on changes in unemployment rates based on education level. Another focus of this study is to identify indications of mismatch between educational output and regional labor market needs. Thus, this study is expected to provide a comprehensive empirical picture and serve as a basis for formulating more integrated employment and education policies based on labor market needs.

METHODS

This study uses a descriptive quantitative approach, which aims to systematically and objectively describe and analyze the phenomenon of unemployment based on education level through numerical data. This descriptive quantitative approach was chosen because this study does not focus on testing causal relationships between variables, but rather on mapping patterns, trends, and differences in the Open Unemployment Rate (TPT) across education levels over a specific period (Sugiyono, 2021; Widarjono, 2020).

The type of data used in this study is secondary data, that is, data already available and published by official institutions. The primary data source for this study comes from the Central Statistics Agency (BPS) of West Sumatra Province, specifically the Open Unemployment Rate (TPT) data by highest education attained for the 2020–2025 period. The use of BPS data is considered to have a high level of validity and reliability because it is compiled based on national and international statistical methodology standards and serves as a primary reference in formulating employment policies in Indonesia (BPS, 2024; Kuncoro, 2021).

The unit of analysis in this study is the working-age population in West Sumatra Province, which is included in the labor force. The primary variable analyzed is the Open Unemployment Rate (TPT), while the differentiating variable is the highest level of education completed, which is grouped into six levels: elementary school and below, junior high school, senior high school, vocational high school, diploma I/II/III, and university. This grouping follows the official classification used by the Statistics Indonesia (BPS) and is commonly used in labor studies in Indonesia (BPS, 2024; Suryahadi, 2020).

Data collection was conducted through documentation, namely by collecting and recording statistical data published by the Statistics Indonesia (BPS) of West Sumatra Province. Data were collected based on the observation periods of February and August each year, as these two periods represent labor market conditions for the current year and are often used as the basis for national and regional employment analysis (Bappenas, 2023; Ministry of Manpower, 2023).

The data analysis technique used in this study was quantitative descriptive analysis, which was conducted through several stages: data classification by education level, data tabulation by time period, and comparison of TPT values between education levels and between years. This analysis aims to identify general patterns, trends in increasing or decreasing unemployment, and differences in unemployment rates across education groups (Arsyad, 2020; Handayani, 2022).

The results of the descriptive quantitative analysis are then interpreted within a macroeconomic framework, specifically to understand labor market dynamics, the phenomenon of educated unemployment, and the mismatch between the education system and regional labor market needs. This interpretive approach is crucial for providing economic meaning to the analyzed statistical data, ensuring that the research results are not merely numerically descriptive but also have analytical and policy value (Sukirno, 2019; Mankiw, 2020).

This study has several limitations, including its limited analysis of the Open Unemployment Rate (TPT) based on education level, without incorporating other variables such as employment sector, wages, or demographic characteristics of the workforce. Furthermore, this study does not test causal relationships between variables, so the results only describe the empirical conditions and differences in unemployment based on education level in West Sumatra Province during the 2020–2025 period (Widarjono, 2020; Sugiyono, 2021).

RESULT AND DISCUSSION

The study results show that unemployment rates are higher among those with secondary and higher education compared to those with lower education. This finding does not fully align with human capital theory, which states that education increases employment opportunities (Mankiw, 2020). However, this finding is consistent with the phenomenon of educated unemployment in developing countries, which suggests that increased education is not always accompanied by the availability of suitable jobs (Suryahadi, 2020; Kuncoro, 2021). From a structural economic perspective, this condition can be explained by a mismatch between graduate competencies and labor market needs (Todaro, 2018).

In addition, the theory of labor market dualism is also relevant, where low-educated workers are more easily absorbed in the informal sector, while educated workers depend on the limited formal sector (Arsyad, 2020). Thus, these findings confirm that the effectiveness of education in reducing unemployment is strongly influenced by economic structure. Without expanding formal employment opportunities, increased education has the potential to increase educated unemployment.

Dynamics of Open Unemployment Rate Based on Education Level (2020–2025)

An analysis of the Open Unemployment Rate (TPT) based on education level in West Sumatra Province during the 2020–2025 period shows significant differences across educational levels.

This difference underscores that education does not always guarantee employment, particularly in the context of a regional economic structure that is not yet fully

capable of providing jobs commensurate with the qualifications of an educated workforce (Suryahadi, 2020; Kuncoro, 2021).

In general, groups with elementary school education and below and junior high school education tend to have lower and relatively stable TPT compared to groups with secondary and higher education. This phenomenon indicates that the low-educated workforce is more flexible and easily absorbed in the informal sector, such as agriculture, small trade, and traditional services, which still dominate the economic structure of West Sumatra (Arsyad, 2020; Bappenas, 2023).

In contrast, high school, vocational high school, diploma, and university graduates exhibit higher and fluctuating unemployment rates. This reflects a mismatch between the output of the education system and the needs of the regional labor market, particularly in the formal sector, which has seen relatively limited growth (Handayani, 2022; Ministry of Manpower, 2023).

Comparison of TPT by Education: Year by Year

Based on education levels in West Sumatra Province during the 2020–2025 period. Conceptually, the Open Unemployment Rate (TPT) in this table represents the proportion of the workforce at each education level that has not been absorbed into the labor market during the observation period of August each year. Therefore, this table not only presents statistics but also reflects the absorption capacity of the regional labor market regarding the quality of human resources produced by the education system (Sukirno, 2019; BPS, 2024).

For those with elementary school education and below and junior high school education, the unemployment rate (TPT) remained relatively low and stable throughout the study period. This definitively indicates that low-educated workers tend to have high job flexibility and are more easily able to enter the informal sector, such as agriculture, small trade, and household-based services. These sectors have low barriers to entry and do not require high formal educational qualifications, allowing them to absorb labor quickly even in fluctuating economic conditions (Arsyad, 2020; Suryahadi, 2020).

In contrast, high school (SMA), vocational high school (SMK), diploma (DIP), and university graduates consistently show higher unemployment rates. This definitively reflects a structural imbalance between the supply of educated labor and the demand for formal labor in West Sumatra. Secondary and higher education graduates generally have more specific job expectations, both in terms of job type, wage level, and employment status, making them less easily absorbed by the informal sector that dominates the regional economy (Kuncoro, 2021; Handayani, 2022).

The high TPT among university graduates in 2020 and 2021, reaching 11.50 percent and 8.90 percent, respectively, clearly reflects the impact of the economic contraction caused by the COVID-19 pandemic on the formal labor market. From a macroeconomic perspective, this condition indicates that economic shocks tend to more rapidly reduce the demand for educated labor, especially in the modern services, education, and industrial sectors that are sensitive to economic slowdowns (Todaro, 2018; Sukirno, 2019). Although the TPT decreased in the 2022–2024 period in line with the economic recovery, a rebound in 2025 indicates that the recovery is not yet fully inclusive of higher education graduates.

Meanwhile, fluctuations in the TPT for vocational high school (SMK) and diploma graduates demonstrate a classic problem with vocational education in Indonesia: the mismatch between graduate competencies and the real needs of the business world.

The data in this table definitively indicates that vocational education has not fully functioned as an effective bridge between education and the world of work, resulting

in vocational high school and diploma graduates still facing a relatively high risk of unemployment (Ministry of Manpower, 2023; Bappenas, 2023).

Table 1. Open Unemployment Rate (TPT) of West Sumatra by Education, 2020–2025
(Percent, August)

Pendidikan	Tahun					
	2020	2021	2022	2023	2024	2025
SD ke Bawah	3,58	4,03	4,63	2,49	3,01	3,09
SLTP	4,92	6,31	5,81	5,19	3,70	4,16
SLTA	8,38	7,71	8,47	8,98	8,07	7,24
SMK	10,58	8,80	6,69	7,60	9,18	7,07
Diploma I/II/III	9,12	8,35	6,03	7,50	7,60	8,03
Universitas	11,50	8,90	6,70	7,55	6,73	7,82

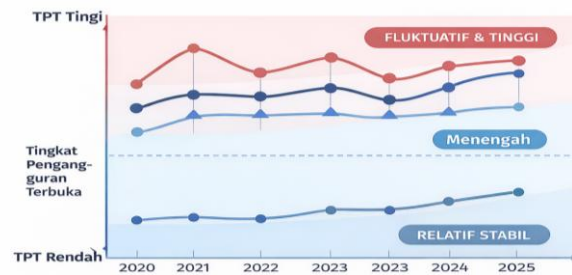
Sumber: BPS Provinsi Sumatera Barat, 2020–2025 (diolah)

Thus, Table 1 confirms that unemployment in West Sumatra during the 2020–2025 period is not homogeneous, but rather clearly segmented by education level. This pattern strengthens the argument that the unemployment problem in the region is structural, not merely cyclical, and requires integrated policy interventions across the education, employment, and regional economic development sectors (Arsyad, 2020; Widarjono, 2020).

Analysis of Unemployment Trends Based on Education

The Open Unemployment Rate (TPT) Trend Analysis Diagram by education level definitively illustrates the structural segmentation of the labor market in West Sumatra Province during the 2020–2025 period. This segmentation indicates that unemployment is not evenly distributed, but rather clustered based on educational attainment. From a macroeconomic perspective, this condition reflects differences in the labor market's absorption capacity regarding the quality and characteristics of the workforce produced by the education system (Sukirno, 2019; Todaro, 2018).

Diagram 2. Trends in Open Unemployment Rates by Education Level in West Sumatra Province, 2020-2025



Sumber: BPS Provinsi Sumatera Barat, 2020–2025 (diolah)

Kelompok penduduk dengan tingkat pendidikan SD ke bawah dan SLTP berada pada

The Open Unemployment Rate remained relatively low and stable throughout the study period. This position definitively indicates that low-educated workers have high flexibility in entering various types of employment, particularly in the informal sector, which dominates West Sumatra's economic structure. This sector does not require high formal educational qualifications and is relatively resilient to economic shocks, enabling it to sustainably absorb labor despite fluctuating macroeconomic conditions (Arsyad, 2020; Suryahadi, 2020).

In contrast, those with high school, vocational high school, diploma, and university degrees occupy the medium to high TPT category, with sharper fluctuations. This definitively indicates that the educated workforce is more dependent on the formal sector, which has limited growth and is highly sensitive to changes in the economic cycle. When economic growth slows or external shocks

such as the pandemic occur, the educated workforce is the most vulnerable to unemployment (Mankiw, 2020; Widarjono, 2020).

The high 'TPT' among vocational school and university graduates demonstrates a mismatch between graduate competencies and the real needs of the regional workforce. Vocational and higher education are normally expected to produce a ready-to-use workforce, but data shows that the increase in the number of graduates is not accompanied by commensurate job creation. This situation definitively indicates structural issues in regional education planning and economic development (Kuncoro, 2021; Handayani, 2022).

Thus, this diagram confirms that improving education without supporting the expansion of productive employment opportunities has the potential to increase educated unemployment. This finding reinforces the argument that education and employment policies must be designed in an integrated manner, oriented not only toward increasing access and educational attainment, but also toward the relevance of skills and job creation in line with regional economic structures (Bappenas, 2023; Ministry of Manpower, 2023).

The Impact of the Pandemic and Economic Recovery on Educated Unemployment

The 2020–2021 period saw a surge in the 'TPT' at almost all educational levels, particularly among vocational high school (SMK) and university graduates. This was inextricably linked to the economic contraction caused by the COVID-19 pandemic, which caused many companies to reduce their workforce or delay recruitment. In a macroeconomic context, this reflects a decline in aggregate demand, which has a direct impact on the labor market (Sukirno, 2019; BPS, 2024).

Entering the 2022–2024 period, the 'TPT' (Top of Entrepreneurship) decreased at several levels of education, in line with the recovery of economic activity. However, unemployment among university and diploma graduates increased again in 2025. This situation indicates that the economic recovery has not yet fully created formal employment opportunities comparable to the growth in the number of higher education graduates (Kuncoro, 2021; Bappenas, 2023).

Structural Implications of Regional Labor Markets

The findings of this study clearly demonstrate that the unemployment problem in West Sumatra Province is structural, not simply a cyclical phenomenon influenced by short-term economic fluctuations. Structural unemployment is reflected in the relatively consistent high Open Unemployment Rate (TPT) among secondary and tertiary education graduates throughout the 2020–2025 period, even as the regional economy began to show signs of post-pandemic recovery. This condition indicates that the unemployment problem is not solely caused by weak aggregate demand, but rather by a fundamental mismatch between the characteristics of the workforce produced by the education system and the structure of available job opportunities in the region (Sukirno, 2019; Kuncoro, 2021).

The high unemployment rate among high school, vocational school, diploma, and university graduates indicates a structural imbalance between the education system and the regional economic structure. Empirically, the West Sumatra economy is still dominated by the primary and informal sectors, which have a high absorption capacity for low-educated workers but are relatively limited in absorbing educated workers. Meanwhile, the modern manufacturing and service sectors, which theoretically serve as the primary reservoirs for educated workers, have not developed optimally. As a result, the increase in the number of secondary and tertiary education graduates has not been accompanied by a commensurate increase in job opportunities (Arsyad, 2020; Bappenas, 2023).

Furthermore, this phenomenon reflects a chronic skills mismatch in the regional labor market. The education system tends to focus on increasing the number

of graduates and administrative achievements, without a corresponding curriculum adjustment to the real needs of the business and industrial world. In this context, vocational education such as vocational high schools (SMK) and diploma programs, which are normatively designed to produce a ready-to-use workforce, still show relatively high unemployment rates. This situation emphasizes that the main problem lies not solely in the level of education, but rather in the relevance of graduates' skills and competencies to the local economic structure (Handayani, 2022; Ministry of Manpower, 2023).

From a regional macroeconomic perspective, the implications of these findings call for a reorientation of development policies that are more integrated between the education, employment, and regional economic development sectors. Education policy cannot stand alone as an instrument for improving human resource quality but must be directly linked to productive job creation strategies. Strengthening the locally resource-based manufacturing sector, developing the modern services sector, and expanding the entrepreneurial ecosystem are essential prerequisites for optimal absorption of an educated workforce into the regional labor market (Todaro, 2018; Arsyad, 2020).

Thus, the findings of this study confirm that education can only function effectively as an instrument for reducing unemployment if supported by structural transformation of the regional economy. Without changes in the economic structure capable of creating quality jobs, improving education has the potential to increase educated unemployment and deepen inequality in the labor market. Therefore, employment and education policies in West Sumatra need to be directed at improving the alignment between educational output and the needs of sustainable regional economic development (Suryahadi, 2020; Widarjono, 2020).

CONCLUSION

Based on the results of a descriptive analysis of the Open Unemployment Rate (TPT) by education level in West Sumatra Province during the 2020–2025 period, it can be concluded that unemployment in this region shows an uneven pattern and is clearly segmented by education level. Population groups with low levels of education, particularly those with elementary school and below and junior high school, consistently have relatively low and stable unemployment rates. This condition indicates that this group is more easily absorbed into the labor market, particularly in the informal sector, which dominates the regional economic structure.

In contrast, population groups with secondary and higher education levels, particularly high school, vocational school, diploma, and university graduates, exhibit higher unemployment rates, which tend to fluctuate from year to year. This finding confirms that increasing education levels do not automatically translate into increased job opportunities.

In the context of West Sumatra, unemployment among educated groups reflects the existence of structural problems in the labor market, namely the limited formal employment opportunities that are able to absorb workers according to the qualifications and expectations of secondary and higher education graduates.

Furthermore, unemployment dynamics during the pandemic and post-pandemic periods show that educated workers are the group most vulnerable to economic shocks. Despite economic recovery in recent years, data shows that this recovery has not been fully inclusive of all educational groups, particularly higher education graduates. Therefore, the unemployment problem in West Sumatra cannot be understood solely as a short-term economic cycle, but rather as a structural issue closely related to the mismatch between the education system and the regional economic structure.

Based on these conclusions, more integrated development policies are needed, oriented toward aligning education with the labor market. Regional

governments need to encourage the creation of productive jobs capable of absorbing workers with secondary and tertiary education, particularly by strengthening the manufacturing, modern services, and creative economy sectors based on local potential. Without expanding these sectors, improving education quality has the potential to have no significant impact on reducing unemployment.

Furthermore, education policies need to be directed at increasing the relevance of graduate competencies to the real needs of the regional workforce. Vocational secondary and higher education must be more adaptive to labor market dynamics, through curriculum adjustments, strengthening work practices, and developing practical skills. These efforts are crucial to ensuring graduates possess not only a diploma but also competencies aligned with regional economic needs.

The regional government also needs to strengthen synergies between the education, employment, and economic development sectors to ensure that policies are not implemented in a fragmented manner. An integrated development approach will enable education to function optimally as an instrument for improving the quality of human resources and simultaneously as a means of reducing unemployment. Thus, development strategies in West Sumatra can be directed not only at increasing educational participation rates but also at creating sustainable and inclusive employment opportunities.

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