

## **EXPLORING THE IMPACT OF HIGHER EDUCATION AND POVERTY ON HUMAN DEVELOPMENT ACROSS INDONESIAN PROVINCES 2018-2022**

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### **ABSTRACT**

This study explores the impact of higher education participation and poverty on human development across Indonesian provinces from 2018-2022. Human development is measured by the human development Index (HDI), Which reflects key aspects of well-being, including education, health, and income. A quantitative approach was employed using panel data regression analysis based on 170 observations from 34 provinces over a five-year period, obtained from the Central Statistics Agency. Higher education participation is measured by the gross enrollment rate in higher education, poverty by the percentage of the population living below the poverty line, and human development by the Human Development Index (HDI). The results of the study indicate that Higher Education Participation has a significant positive effect on Human Development, while poverty has a significant negative effect on human development. The R-squared value indicates that 39.3% of the variation in Human Development can be explained by these two variables, while the remainder is influenced by other factors outside the model. The contribution of this study lies in providing the latest empirical evidence that strengthens the position of higher education as a long-term strategy in human resource development.

**Keywords: Higher education participation, Poverty, Human development, Panel data**

### **ABSTRAK**

Penelitian ini mengeksplorasi pengaruh partisipasi perguruan tinggi dan kemiskinan terhadap pembangunan manusia di provinsi-provinsi di Indonesia periode 2018 hingga 2022. Pembangunan manusia diukur menggunakan Indeks pembangunan manusia (IPM), Partisipasi perguruan tinggi diukur menggunakan angka partisipasi perguruan tinggi (APK) perguruan tinggi, kemiskinan melalui persentase penduduk miskin. Pendekatan kuantitatif digunakan dengan analisis regresi data panel berdasarkan 170 observasi dari 34 provinsi selama lima tahun, yang diperoleh BPS. Hasil penelitian menunjukkan bahwa Partisipasi Perguruan Tinggi berpengaruh positif signifikan terhadap Pembangunan Manusia, kemiskinan berpengaruh negatif signifikan terhadap pembangunan manusia. Nilai (R-squared) menunjukkan 39,3% variasi Pembangunan manusia dapat dijelaskan oleh kedua variabel tersebut, sedangkan sisanya dipengaruhi oleh faktor lain di luar model. Kontribusi penelitian ini terletak pada penyediaan bukti empiris terkini yang memperkuat posisi pendidikan tinggi sebagai strategi jangka panjang dalam pembangunan sumber daya manusia.

**Kata kunci: Partisipasi perguruan tinggi, Kemiskinan, Pembangunan manusia, Data panel**

## INTRODUCTION

Human development is a vital indicator of a nation's progress, encompassing key dimensions such as education, health, and a decent standard of living. In Indonesia, the Human Development Index (HDI) is widely used to assess the population's overall quality of life. Amid ongoing efforts to improve human development outcomes, two interrelated factors higher education participation and poverty remain central issues that significantly influence HDI (Wahyuni et al., 2022). While the government has implemented various programs to expand access to education and reduce poverty, persistent regional disparities suggest that existing policies have not yet achieved equitable outcomes across provinces.

Previous studies have explored the relationship between education, poverty, and human development. For instance, Aminda et al. (2024) emphasized the role of education in enhancing individual capabilities and productivity, while Anwar (2022) argued that poverty restricts access to essential services and better life opportunities. In the context of Indonesia, empirical studies such as those by Permatasari et al. (2024) and Lazuardy and Sumiyarti (2024) confirm that higher education positively correlates with HDI, whereas poverty has a negative effect. However, these studies present several notable limitations. First, many employ cross-sectional data, which limits the ability to capture both temporal changes and spatial disparities. Second, previous research often treats education and poverty as separate variables rather than examining their interconnection. Third, there is a lack of analysis focusing on long-term provincial-level dynamics, particularly within the framework of Indonesia's decentralized development system. These limitations highlight a clear research gap that needs to be addressed.

This study aims to fill that gap by analyzing the simultaneous effects of higher education participation and poverty on human development across 34 provinces in Indonesia over the 2018–2022 period using panel data regression. The methodological approach allows for a more nuanced understanding of both spatial and temporal dynamics, which previous studies have largely overlooked. The study integrates educational and economic indicators measured through gross tertiary enrollment rates and poverty rates sourced from Badan Pusat Statistik (BPS). The novelty of this research lies in three main aspects: the use of panel data regression to comprehensively capture regional and temporal variations, the simultaneous examination of two interrelated factors education and poverty as determinants of HDI, and the relevance of the findings for formulating integrated, evidence-based policies. By bridging empirical gaps in the literature, this study is expected to contribute both theoretically and practically to efforts aimed at improving human development in Indonesia. This study explores the impact of higher education participation and poverty on human development across Indonesian provinces from 2018-2022.

## LITERATURE REVIEW

Higher education plays a crucial role in improving the quality of human resources, a core component of human development. Education, particularly at the tertiary level, contributes to increased critical thinking capacity, job skills, and the ability to adapt to economic and social change (Holzer et al., 2021). Empirical studies such as those conducted by Schofer et al. (2020) show that countries with high levels of higher education participation tend to have better human development indices (HDI). Higher education also contributes to social equality, fostering innovation, and fostering community participation in sustainable development, thus having a positive and significant impact on improving community well-being.

Conversely, poverty is a major inhibiting factor in human development. High poverty rates tend to reduce people's access to basic services such as education, health, and productive economic facilities, which directly lowers scores on the human development index. According to research by Apergis et al. (2022), people living in poverty tend to experience structural

barriers to breaking out of the cycle of underdevelopment, particularly in education and health. Empirically, a study by Hasan (2021) confirms a significant negative relationship between poverty levels and human development. When per capita income is low and inequality is high, people's ability to pursue a decent and productive life is increasingly limited.

When higher education participation and poverty are analyzed simultaneously, both demonstrate a significant influence on human development. High participation in higher education can strengthen people's capacity to escape the cycle of poverty, while high poverty levels can reduce access to higher education, creating a cycle of mutual influence. Research by Chankseliani and McCowan (2021) shows that increasing investment in higher education can narrow social and economic disparities, ultimately having a positive impact on the Human Development Index (HDI). Conversely, a study by Chankseliani et al. (2021) emphasizes the importance of a development approach that simultaneously addresses both aspects: expanding access to education and addressing structural economic barriers. Therefore, the synergy between increasing higher education participation and poverty reduction is a crucial strategy for accelerating inclusive and sustainable human development.

## METHOD

This study employs a quantitative approach to analyze the influence of tertiary education participation and poverty on human development in Indonesia from 2018 to 2022. The quantitative method is appropriate for examining relationships among variables and testing hypotheses using statistical techniques based on numerical data. Human development is viewed as a multidimensional process aimed at improving the quality of life, represented by the Human Development Index (HDI), which includes indicators of health, education, and standard of living. Tertiary education participation reflects access to higher education among the population, measured by the Gross Enrollment Ratio. Poverty refers to the inability to meet basic needs, represented by the percentage of the population living below the national poverty line. This study uses secondary data sourced from official publications of Statistics Indonesia (BPS). HDI values, GER for higher education, and provincial poverty rates are compiled into a documentation sheet as the research instrument. The unit of analysis is the province year comprising 34 provinces observed over a five-year period (2018–2022) resulting in a panel dataset of 170 observations. The sampling technique used is census sampling, as data for all provinces across the study period is available and utilized. Data are analyzed using panel data regression processed in EViews 12. This method allows the integration of cross-sectional and time-series dimensions to assess dynamic relationships across regions and over time. Model selection is conducted using the Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test to determine the most appropriate model among the Common Effect, Fixed Effect, and Random Effect models. To ensure the validity of the regression model, classical assumption tests are performed, including normality, multicollinearity, heteroscedasticity, and autocorrelation. Hypotheses are tested using t-tests (partial significance), F-tests (simultaneous significance), and the coefficient of determination ( $R^2$ ), which indicates the proportion of variance in human development explained by the independent variables.

## RESULTS AND DISCUSSION

### Descriptive Data

Descriptive statistics were used to provide an overview of the distribution of data for each variable in the study: Human Development Index (HDI), Tertiary Education Participation, and Poverty, covering the period from 2018 to 2022 across 34 provinces in Indonesia. Based on Table 1, The Human Development Index (HDI) recorded a mean value of 71.16, with a maximum of 81.65 and a minimum of 60.06. The standard deviation was 3.92, indicating a moderate variation in HDI across provinces. This suggests that while most regions have

achieved relatively good levels of human development, notable disparities in quality of life persist. This aligns with UNDP (2020) findings, which highlight regional disparities as a critical challenge to human development in developing countries like Indonesia.

	Y	X1	X2
Mean	71.16741	33.97006	10.53888
Median	71.29500	32.87000	8.765000
Maximum	81.65000	75.59000	27.74000
Minimum	60.06000	13.20000	3.470000
Std. Dev.	3.916709	10.66408	5.451821
Skewness	0.066374	1.356265	1.133722
Kurtosis	4.269916	6.701737	3.956060
Jarque-Bera	11.54802	149.1798	42.89208
Probability	0.003107	0.000000	0.000000
Sum	12098.46	5774.910	1791.610
Sum Sq. Dev.	2592.563	19219.12	5023.078
Observations	170	170	170

Figure 1. Descriptive Analysis

The Tertiary Education Participation variable had a mean value of 33.97%, indicating that, on average, approximately 33.97% of individuals aged 19–23 were enrolled in higher education during the study period. The highest value was 75.59%, observed in the Special Region of Yogyakarta, which reflects superior access and awareness regarding higher education. In contrast, the lowest value was 13.20%, recorded in Papua Province, highlighting significant disparities in higher education access across regions. Priambodo (2021) emphasizes that high participation in tertiary education contributes to increased labor productivity and skills, which in turn enhances human development.

Poverty recorded an average rate of 10.53%, with the highest rate of 27.74% found in Papua and the lowest at 3.47% in DKI Jakarta. The standard deviation of 5.45% reveals substantial variation across regions. These findings reaffirm Banerjee et al. (2022) view that poverty is multidimensional and deeply linked to limited access to basic services such as education and healthcare both of which are essential components of human development.

### Model Selection Results of Panel Data Regression

This study employed panel data regression analysis to examine the effect of higher education participation and poverty on human development across 34 provinces in Indonesia during the period 2018–2022. To determine the most appropriate estimation model, three stages of model selection tests were conducted.

#### *Chow Test (Common Effect vs. Fixed Effect)*

Initial testing was conducted using the Chow Test to determine whether the fixed effects model (FEM) was more appropriate than the common effects model (CEM). Based on Figure 2, the Chow Test results showed a p-value <0.05. This indicates that there is a significant difference between the CEM and FEM models, so the fixed effects model is more appropriate than the common effects model. In other words, individual characteristics in each province in Indonesia during the 2018–2022 period have different influences on human development, so they need to be included as fixed components in the model.

Redundant Fixed Effects Tests				
Equation: MODELESTIMATE_FEM				
Test cross-section fixed effects				
Effects Test	Statistic	d.f.	Prob.	
Cross-section F	97.444220	(33,134)	0.0000	
Cross-section Chi-square	547.191598	33	0.0000	
Cross-section fixed effects test equation:				
Dependent Variable: Y				
Method: Panel Least Squares				
Date: 04/25/25 Time: 06:46				
Sample: 2018 2022				
Periods included: 5				
Cross-sections included: 34				
Total panel (balanced) observations: 170				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	70.56680	0.662072	106.5847	0.0000
X1	0.173118	0.016612	10.42131	0.0000
X2	-0.501023	0.032494	-15.41896	0.0000
R-squared	0.660211	Mean dependent var	71.16741	
Adjusted R-squared	0.656141	S.D. dependent var	3.916709	
S.E. of regression	2.296737	Akaike info criterion	4.518345	
Sum squared resid	880.9249	Schwarz criterion	4.573683	
Log likelihood	-381.0593	Hannan-Quinn criter.	4.540801	
F-statistic	162.2406	Durbin-Watson stat	0.039483	
Prob(F-statistic)	0.000000			

Figure 2. Chow Test Results

*Hausman Test (Fixed Effect vs. Random Effect)*

After determining that the Fixed Effect Model is more appropriate than the Common Effect Model, the next step is to conduct a Hausman test to select between the Fixed Effect Model (FEM) and the Random Effect Model (REM). Based on Figure 3, the test results show a p-value > 0.05, indicating no significant difference between the estimated parameters of the two models. Therefore, the Random Effect Model is considered more efficient and appropriate to use than the Fixed Effect Model. The use of this random model indicates that differences between provinces are considered random elements that are uncorrelated with the independent variables in the model.

Correlated Random Effects - Hausman Test				
Equation: MODELESTIMATE_REM				
Test cross-section random effects				
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section random	0.313275	2	0.8550	
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
X1	0.191848	0.179829	0.001069	0.7132
X2	-0.442471	-0.482421	0.006603	0.6230
Cross-section random effects test equation:				
Dependent Variable: Y				
Method: Panel Least Squares				
Date: 04/25/25 Time: 06:48				
Sample: 2018 2022				
Periods included: 5				
Cross-sections included: 34				
Total panel (balanced) observations: 170				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	69.31349	1.926132	35.98584	0.0000
X1	0.191848	0.043285	4.432195	0.0000
X2	-0.442471	0.100635	-4.396783	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.986407	Mean dependent var	71.16741	
Adjusted R-squared	0.982857	S.D. dependent var	3.916709	
S.E. of regression	0.512825	Akaike info criterion	1.687806	
Sum squared resid	35.24058	Schwarz criterion	2.351858	
Log likelihood	-107.4635	Hannan-Quinn criter.	1.957271	
F-statistic	277.8300	Durbin-Watson stat	1.006308	
Prob(F-statistic)	0.000000			

Figure 3. Hausman Test Results

*Lagrange Multiplier (LM) Test (Common Effect vs. Random Effect)*

The final testing step is the Lagrange Multiplier (LM) Test, which compares the common effects model (CEM) with the random effects model (REM). The LM Test results show a p-value <0.05, indicating that the Random Effects model is statistically more appropriate than the Common Effects model. This result further strengthens the decision to use the Random Effects Model (REM) in this study. Thus, the REM model is considered most appropriate for analyzing the panel data used, as it is able to efficiently capture variations between provinces without compromising the validity of parameter estimates.

Lagrange Multiplier Tests for Random Effects			
Null hypotheses: No effects			
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives			
	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	306.7343 (0.0000)	0.010503 (0.9184)	306.7448 (0.0000)
Honda	17.51383 (0.0000)	-0.102483 (0.5408)	12.31168 (0.0000)
King-Wu	17.51383 (0.0000)	-0.102483 (0.5408)	5.661728 (0.0000)
Standardized Honda	18.30461 (0.0000)	0.216721 (0.4142)	9.231242 (0.0000)
Standardized King-Wu	18.30461 (0.0000)	0.216721 (0.4142)	3.387566 (0.0004)
Gourieroux, et al.	--	--	306.7343 (0.0000)

Figure 4. Lagrange Multiplier Results

**Hypothesis Testing Results**

Based on the results of partial (t-test) and simultaneous (F-test) statistical analyses, the following conclusions can be drawn:

*Hypothesis 1 (H<sub>1</sub>): The Impact of Higher Education Participation on Human Development*

The t-test results show that participation in higher education has a positive and significant impact on human development, as indicated by a t-statistic value of 6.339 and a significance value of 0.0000 < 0.05. This indicates that the higher the level of community participation in higher education, the higher the human development index (HDI) of a region. Higher education contributes significantly to increasing the intellectual capacity, skills, and competitiveness of individuals in facing social and economic challenges (Hanum et al. 2022). Therefore, increasing access and quality of higher education is an important strategy in accelerating inclusive and sustainable human development (Nastiti & Nailufar, 2023; Nurfarizki et al. 2024).

*Hypothesis 2 (H<sub>2</sub>): The Impact of Poverty on Human Development*

The analysis also shows that poverty has a negative and significant impact on human development, as reflected in the t-statistic value of -8.126 and p-value of 0.0000 < 0.05. This means that the higher the poverty rate in a region, the lower its human development achievements. Poverty limits people's access to adequate education, health, and economic services, which ultimately hinders improvements in overall quality of life (Bernadette & Arrafi, 2021). These results emphasize the importance of poverty alleviation policies as one of the

main pillars in human development strategies, particularly in improving the index of basic components such as longevity, education, and a decent standard of living.

*Hypothesis 3 (H<sub>3</sub>): The Simultaneous Effect of Higher Education Participation and Poverty on Human Development*

Testing using the F-test shows that simultaneously, participation in higher education and poverty have a significant influence on human development. This implies that both variables together explain variations in the human development index in Indonesia. The interrelationship between education and poverty is a key factor determining the success of human development (Mandey et al., 2023; Senewe et al., 2020). By increasing access to higher education and simultaneously reducing poverty levels, the government can create a strong synergy to accelerate the achievement of the Sustainable Development Goals (SDGs), particularly in the aspects of education quality (SDG 4) and poverty alleviation (SDG 1).

## CONCLUSION AND RECOMMENDATION

This study investigated the impact of higher education participation and poverty on human development in Indonesia using panel data from 2018 to 2022. The findings confirmed that both factors play significant and opposing roles higher education participation contributes positively to human development, while poverty exerts a negative influence. Together, these variables account for a portion of the variation in Indonesia's Human Development Index (HDI), highlighting the importance of targeted education and poverty-reduction strategies in shaping developmental outcomes. The findings highlight the need for integrated policy approaches that improve access to higher education while simultaneously addressing poverty. Human development is a multifaceted outcome that cannot be driven by education alone; it requires structural changes that reduce socio-economic inequality. Therefore, efforts to increase tertiary education participation must be accompanied by equitable education quality and poverty reduction programs that tackle underlying disparities.

This study is limited to data from 34 provinces in Indonesia during the period 2018–2022 and relies solely on secondary data from BPS. As such, the findings are constrained by the availability and completeness of official data sources. Future research could benefit from a broader range of data and longer timeframes to obtain more comprehensive insights. Future studies should consider incorporating a wider range of explanatory variables such as healthcare access, quality of education, infrastructure development, and labor market dynamics to capture more complex interactions affecting human development. In addition, expanding the time frame beyond 2022 and disaggregating analysis by urban-rural or gender dimensions could provide deeper insights into disparities and progress. Mixed-method approaches, combining quantitative analysis with qualitative field data, are also encouraged to contextualize statistical findings and inform more grounded policy recommendations.

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