

Inequality of Education in Indonesia by Gender, Socioeconomic Background and Government Expenditure

By

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ABSTRACT

Education plays an important role in improving the quality of human resources capable of encouraging economic and social development. Education is also one of the goals of the sustainable development goals in increasing the quantity and quality of human resources continuously which must be carried out equitably and accessible to all without education, geographical, social and economic status. However, the issue of education inequality has recently become a serious concern both at the provincial and district or city levels. This study aims to analyze the factors that influence educational inequality in Indonesia in 2019 and 2020. The analytical method in this study uses panel data regression with 5 equation models. The results show that gender inequality and education budgets can reduce educational inequality.

Keywords: Education Inequality, Gender Gap, Education Expenditure, Indonesia

ABSTRAK

Pendidikan sangat berperan penting dalam meningkatkan kualitas sumber daya manusia yang mampu mendorong pembangunan ekonomi dan sosial. Pendidikan juga termasuk salah satu tujuan pembangunan berkelanjutan dalam meningkatkan kuantitas dan kualitas sumber daya manusia secara terus menerus yang harus dilakukan secara merata dan dapat diakses oleh semua orang tanpa batasan pendidikan, status geografis, sosial dan ekonomi. Namun, isu ketimpangan pendidikan akhir-akhir ini menjadi perhatian serius baik di tingkat provinsi maupun kabupaten atau kota. Penelitian ini bertujuan untuk menganalisis faktor-faktor yang mempengaruhi ketimpangan pendidikan di Indonesia pada tahun 2019 dan 2020. Metode analisis dalam penelitian ini menggunakan regresi data panel dengan 5 model persamaan. Hasil penelitian menunjukkan bahwa ketidaksetaraan gender dan anggaran pendidikan dapat menurunkan ketimpangan pendidikan.

Kata Kunci: Ketimpangan Pendidikan, Kesenjangan Gender, Pengeluaran Pendidikan, Indonesia

INTRODUCTION

Education plays an important role in promoting economic and social development, as well as improving the quality of human resources through quality of life. Education is the basis for improving the quality of human resources and ensuring economic and social development (Todaro and Smith, 2000). Education is one of the targets of the Sustainable Development Goals (SDGs) in 2030, namely ensuring the quality of inclusive and equitable education and increasing lifelong learning opportunities for all. The importance of education was also emphasized in the preamble of the 1945 Constitution and has

become one of the national ideals and the ideals of the nation's life. Given the central role of education, Therefore, it is important to continue to increase the quantity and quality of education so that it can be carried out evenly and can be accessed by everyone without educational restrictions, geographical conditions, social and economic status. However, the issue of education inequality has recently become a worrying concern both at the provincial and district or city levels. One indicator that can be used to describe inequality and equity in educational attainment among residents of a region is the Gini coefficient of education. According to Thomas et al (2000), the educational Gini index close to 1 indicates a higher inequality in educational attainment. Meanwhile, if it is close to 0, it indicates a lower educational inequality. An overview of educational inequality in 34 provinces of Indonesia can be seen in Figure 1. below:

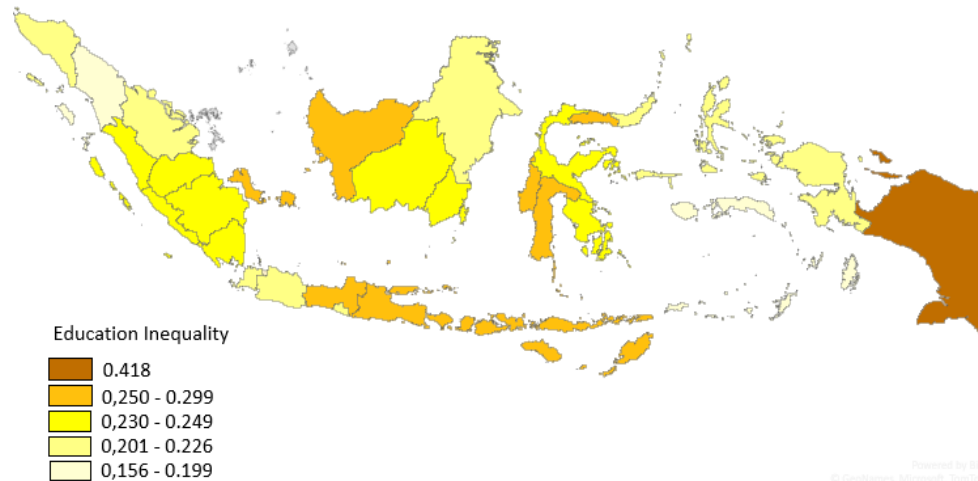


Figure 1. Education Inequality in 34 Provinces in Indonesia, 2020
Source: Central Bureau of Statistics, 2020

Figure 1. shows education inequality in 34 provinces in Indonesia in 2020. The provinces with the highest educational inequality are Papua (0.418), West Nusa Tenggara (0.299), and West Kalimantan (0.296), while the lowest is DKI Jakarta (0.156), Riau Islands (0.188), and Moluccas (0.196). Based on these data, educational attainment among provinces in Indonesia has not yet been fully felt or accessed, especially by people in Eastern Indonesia such as Papua, where the level of educational inequality is very high compared to other provinces.

Education is the main capital for humans to prosper. The importance of the role of education in improving welfare demands the need for equal distribution of education in each region regardless of socio-economic background, gender and race. In equal distribution of education, it is necessary to know the factors that influence educational inequality, such as gender inequality, the percentage of the population who have a school diploma (Elementary, Middle School, High School and University), the education budget, the percentage of the poor, income inequality and GRDP per capita. Equality in education is a matter of how the education system can provide the widest possible education opportunities for all citizens which are the responsibility of all parties, including the central government and local governments. The gender gap in education shows a gap between women and men in obtaining benefits from education (Nugroho, 2011). The gender gap in education is still widening. This leads to the unfortunate situation that often occurs with girls especially from low-income families, where they often face very difficult choices.

Todaro and Smith (2011) argue that in most developing countries, young women are less educated than men. In much of the world, girls still lag behind boys. The majority of people who are illiterate and out of school in developing countries are women. Based on data from BPS, the population aged 10 years and over who are illiterate is 2.32 percent for men and 4.92 percent for women. So it

can be concluded that the gender gap in education between women and men in Indonesia in 2020 is 2.6 years. Reducing the gender gap in the education sector is needed to address educational inequality. Previous research conducted by (Sholikhah et al., 2014; Harahap et al., 2020) showed that the greater the gender inequality, the higher the level of educational inequality. However, the results of this study are different from the research conducted by (Hamzah et al., 2017; Banzragch et al., 2019) which showed that gender inequality has a negative relationship with educational inequality.

Todaro and Smith (2011) find that the provision of educational institutions is limited by the level of public spending. More government funding for education will improve facilities, access and quality of education in order to increase the level of education. The government can increase the capacity of human resources and the productive capacity of the nation through education. Based on research conducted by (Amin et al., 2020; Hamzah et al., 2017; Bustomi, 2012) the education budget has a negative and significant effect on educational inequality. This means that the greater the budget issued by the government for the education sector, the greater the education inequality in a region. However, the results of this study are different from the research conducted by (Adiningtyas & Budyanra, 2020; Banunu, 2021)

Another factor that causes inequality in education is the high income inequality that occurs in the community. The condition where the distribution of income received by the community is uneven, so that there is a difference between people who earn high and low incomes. Todaro and Smith (2011) show that there is a positive relationship between education level and income level. The higher the education inequality achieved by the population of a region, the higher the income inequality. The results of previous studies which state that income inequality causes educational inequality, the results of the study (Harahap et al., 2020) show that income inequality has a positive and significant influence on inequality, The higher the income inequality, the smaller the opportunity for people to access education. However, this is different from the research conducted (Bustomi, 2012) which concluded that income inequality has no effect and has a negative coefficient value on educational inequality.

Poverty is also one of the factors that influence inequality in education. Poverty has a large enough impact on demand and school enrollment rates where the education level of the poor will be low. Poverty and inequality in education A person can be said to be poor or living below the poverty line if income or access to goods and services is relatively low. In absolute terms, a person is said to be poor if his income or standard of living is really below the poverty line (Harahap et al., 2020). Several previous studies related to the effect of poverty on educational inequality that have been studied by (Adiningtyas & Budyanra, 2020; Banunu, 2021; Harahap et al., 2020; Soejoto et al., 2016) show that poverty has a positive effect on educational inequality. That is, the poorer an area, the higher the educational inequality. This happens because of the economic factors of poor families. Children from poor families have few opportunities to go to school because they prefer to help their parents in meeting the economic needs of the family rather than continuing their education. Thus, educational inequality between community groups will be even greater.

There have been many previous studies examining the factors that influence educational inequality. However, there are not many studies that use social and economic variables on educational inequality in one research scope. So this study aims to identify the variables of gender inequality, education budget, percentage of poor people, income inequality, GRDP per capita and percentage of population who have a school diploma on educational inequality in 34 provinces in Indonesia in 2019 and 2020. So what is expected from this research can be used as policy recommendations from social and economic factors in reducing educational inequality in Indonesia and can be achieved in accordance with the 2030 SDGs target.

METHODS

This study aims to analyze the factors that influence educational inequality in 34 provinces of Indonesia in 2019 and 2020. The type of data used in this study is quantitative data in the form of secondary data obtained from the publications of the Central Statistics Agency. This study processes data from the dependent variable of the Gini Index of education as a variable of income inequality. While the

independent variables used are gender inequality, education budget, percentage of the poor, income inequality, GRDP per capita and the percentage of the population who have a school diploma (elementary, junior high, high school and college). Baseline controls and additional controls variables as elements that do not change during the experiment. In other words, the control variable is a stimulus variable that makes it easier for researchers to understand the variables being tested. The data analysis used in this research is the panel data regression method with the following equation model:

$$EDUCINEQ_{it} = \beta_0 + \beta_1 GENDERGAP_{it} + \beta_2 EDUCSPEND_{it} + \delta \cdot CONTROLS_{it} + \varepsilon_{it}$$

The operational definition of each variable can be seen in Table 1. The following:

Table 1. Operational Variables

Variable Code and Label	Definition Variable
Dependent Variable	
EDUCINEQ Education Inequality (Index)	Educational inequality as measured by Education Gini Coefficient
Independent Variable	
GENDERGAP Gender Gap (Percent)	The ratio of female illiterates to male illiterates
EDUCSPEND Education Spending (Persen)	The amount of government spending on the education sector from the total Physical DAK budget per total number of students at all levels of education, expressed as a percentage of GRDP per capita
Baseline Controls	
POVERTY Poverty (Percent)	Percentage of population below the poverty line
GINI Gini Ratio (Index)	The Gini coefficient on the Lorenz curve, the cumulative expenditure curve compares the distribution of certain variables with the same distribution representing the cumulative percentage of the population
GRDP Gross Regional Domestic Product (Thousand Rupiah)	Gross regional domestic product per capita at 2010 constant prices
Additional Controls	
PRIMARY Primasty School (Percent)	Percentage of Population aged 15 Years in Urban and Rural and The Highest School Certificate Owned (Primary School)
SECONDARY Junior High School (Percent)	Percentage of Population aged 15 Years in Urban and Rural and The Highest School Certificate Owned (Junior High School)
TERTIARIES Senior High School (Percent)	Percentage of Population aged 15 Years in Urban and Rural and The Highest School Certificate Owned (Senior High School)
HIGHER Diploma/Bachelor/Master/Doctor (Percent)	Percentage of Population aged 15 Years in Urban and Rural and The Highest School Certificate Owned (Diplom/Bachelor/Master/Doctor)

Source: Central Bureau of Statistics, 2019-2020

Thomas et al. (2001) calculated education inequality using the formulation of the education Gini index by adapting (Thomas et al. 2001), as follow: Calculating the Gini Index of Education by using the following:

$$E = \left(\frac{1}{\mu}\right) \sum_{i=2}^n \sum_{j=1}^{i-1} p_i |y_i - y_j| p_j$$

Description:

- E = Education Gini Index based on distribution of school achievement
- μ = The average length of schooling of the population in question
- p_j and p_i = Proportion of population with definite level of school achievement
- y_i and y_j = Years of schooling at different levels of educational attainment
- n = Number of school achievement categories in the data

For reasons of data availability, this study used n = 5, with the following categories: not graduating from elementary school, graduating from elementary school, graduating from junior high school, graduating from high school, and university. With 5 school level achievement categories then:

$$E = \left(\frac{1}{\mu}\right) (P_2(Y_2 - Y_1)P_1 + P_3(Y_3 - Y_1)P_1 + P_3(Y_3 - Y_2)P_2 + \dots + P_n(Y_n - Y_1)P_1 + P_n(Y_n - Y_2)P_2 + \dots + P_n(Y_n - Y_{n-1})P_{n-1})$$

Description:

- E = Education Gini index based on the distribution of school achievement
- μ = Average years of schooling of the population concerned
- P1 = population proportion not completed in primary school
- P2 = Proportion of population graduated from elementary school
- P3 = Proportion of population graduated from junior high school
- P4 = Proportion of population graduated from high school
- P5 = College population proportion

To calculate years of schooling at 5 levels then:

- Not completed in primary school : 3 years
- finished elementary school : 6 years
- High school graduate : 9 years
- finished high school : 12 years old
- University : 15 years

The Education Gini Index can be used to determine the level of equity in education. The Gini index ranges from 0 (Perfect Evenness) and 1 (Perfect Inequality). Education Gini Index 0,7 = very high inequality, Education Gini index 0,5 – 0,7 = high inequality, Education Gini index 0,36 – 0,49 = moderate inequality, Education Gini index 0,2 – 0,35 inequality low, and Education Gini Index less than 0,2 = Very low inequality (Todaro, 2011).

RESULTS AND DISCUSSIONS

The selection of the best model in the panel data regression method consists of 3 models, namely the Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM). The best model was selected through the Chow Test and Hausman Test. This study has followed the steps to select the best model, and concluded that the appropriate model is the Fixed Effect Model (FEM). As shown in Table 2, two tests state that FEM is the best model.

Table 2. Results of Selection of the Best Model

Test	Probability Value	Hypothesis and Results
Chow test	0.0000	H0 : CEM model. H1 : FEM model. Result: Reject H0, the best model is FEM
Hausman test	0.0000	H0 : REM model. H1 : FEM model. Result: Reject H0, the best model is FEM.
Decision:	Two tests chose FEM as the best model.	

Source: processed using Stata 16 (2021)

Table 3. Summary Statistics

Variables	Obs	mean	Std. Dev.	Min	Max
Dependent Variable					
EDUCINEQ	68	0.2454459	0.04427	0.1526518	0.4212485
Independent Variable					
GENDERGAP	68	2.22431	0.6854713	0.68	3.9
EDUCSPEND	68	17.00355	15.85527	0.0339217	74.16094
Baseline Controls					
POVERTY	68	10.33176	5.438953	3.42	26.64
GINI	68	0.3484118	0.0373704	0.257	0.437
GRDP	68	10.48788	0.5375385	9.426809	12.06634
Additional Controls					
PRIMARY	68	22.74809	4.364404	13.07	30.09
SECONDARY	68	21.26765	2.112992	17.1	25.94
TERTIARIES	68	24.27412	5.145452	13.53	38.49
HIGHER	68	8.291618	1.989121	4.55	13.06

Source: Authors' estimation using the Central Bureau of Statistics (2021)

Classical assumption testing is carried out with several tests, namely: 1. Normality test; based on the regression results, it was found that the Jarque-Berrate test (0.8306) is less than (<) the Chi-Square table value (76.78), so the conclusion is that the data is normally distributed. 2. Multicollinearity test; Based on the regression results, it was found that the Correlation Matrix value between the independent variables was less than (<) 0,8, so the conclusion was that there was no multicollinearity condition between the independent variables. 3. Test of heteroscedasticity and autocorrelation; based on the data showing that the probability result is greater than the alpha value (0.05), it can be concluded that there is no heteroscedasticity and autocorrelation condition. The data in this study have met the criteria that are in accordance with the data research mechanism by being proven to have no data disturbances in the classical assumption test. Estimated panel data with Fixed Effect Model as follows:

Table 4. Structural Transformation and Education Inequality: Fixed Effect Estimations

Dependent variable: Education Inequality					
Variables	(1)	(2)	(3)	(4)	(5)
Independent Variable					
GENDERGAP	-0.00268*	-0.00310*	-0.000382	-0.00339*	-0.000380
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
EDUCSPEND	0.0000155			0.0000184	-0.0000128
	(0.000)			(0.000)	(0.000)
Baseline Controls					
POVERTY	-0.00268	-0.00620**		0.00539*	-0.00125

	(0.002)	(0.002)		(0.002)	(0.001)
InGRDP	0.0796**	0.148***	0.0425*	0.140***	0.0444*
	(0.026)	(0.025)	(0.010)	(0.032)	(0.020)
GINI		0.154*			0.0739
		(0.066)			(0.040)
Additional Controls					
PRIMARY	-0.00387***	-0.00393***	-0.00280***	-0.00385***	-0.00286***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
TERTIARIES	-0.00115*		-0.00258***		-0.00243***
	(0.001)		(0.000)		(0.000)
SECONDARY		-0.00129*	-0.00347***	-0.00119*	-0.00340***
		(0.001)	(0.000)	(0.001)	(0.000)
HIGHER	-0.00181		-0.00182**	-0.00188	-0.00156*
	(0.001)		(0.001)	(0.000)	(0.000)
Constant	-0.425	-1.178***	0.0154	-1,028**	-0.0227
	(0.276)	(0.276)	(0.212)	(0.353)	(0.217)
R-square (within)	0.8171	0.7973	0.9405	0.7911	0.9457
Observations	68	68	68	68	68
Adjusted R ²	0.796	0.777	0.935	0.767	0.937

p-values in parentheses

* *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001

Source: Authors' estimation using the Central Bureau of Statistics, 2021

Table 4. presents the main results of the panel data estimation of the fixed effect model (based on the Hausman specification test) which consists of many models. In education inequality, econometric estimates show similar findings to (Hamzah et al., 2017; Baloch et al., 2017; Banzragch et al., 2019) of evidence of a relationship between factors influencing educational inequality in Indonesia. Models 1, 2, and 4 show negative and significant results in gender inequality on educational inequality and models 3 and 5 show negative and insignificant results. This shows that the higher the gender inequality, the higher the education inequality.

The econometric estimation of the education budget on education inequality shows similar findings to (Sholikhah et al., 2014) Models 1 and 4 of the education budget show positive and insignificant results on education inequality. A positive sign of educational inequality means an increase in educational inequality. This shows that the education budget provided by the government is still not optimal and can be evenly accessed by the community, especially by the poor and geographical conditions between regions that are difficult to access education services. Meanwhile, model 5 of the education budget shows negative and insignificant results on education inequality. The higher the education budget that is allocated to the community and can be accessed and optimized, it will have an impact on reducing educational inequality. These results are similar to research (Adiningtyas & Budyanra, 2020; Banunu, 2021). The education budget in 34 Indonesian provinces in 2020 can be seen in the following quadrant image:

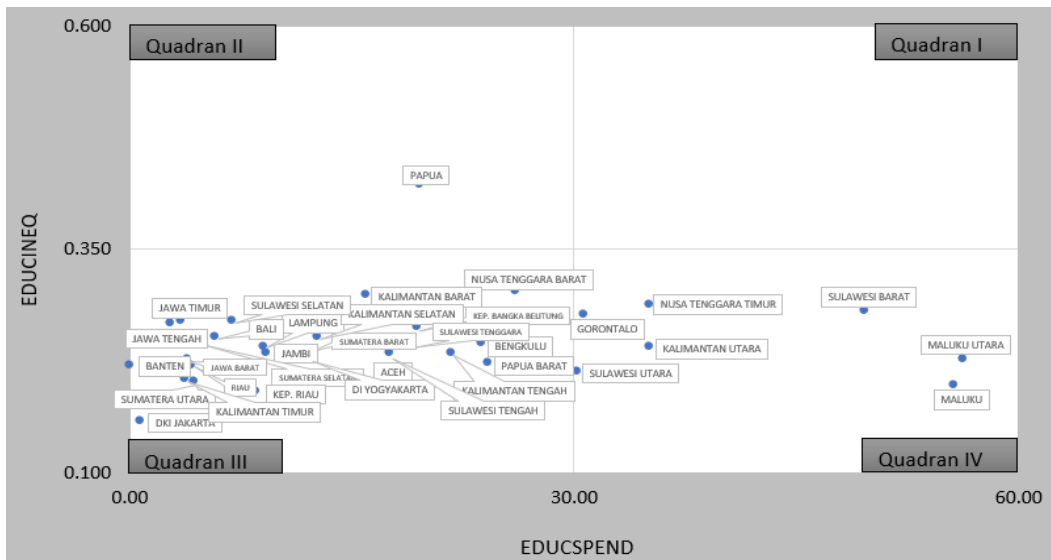


Figure 2. Education Spending and Education Inequality in 34 Provinces in Indonesia, 2020
 Source: Central Bureau of Statistics, 2020

Figure 2. Shows provincial groups by education budget and education inequality as measured by the Education Gini Index. Quadrant 1 is a group of provinces with very high education budgets, but relatively large educational inequality. There are no provinces in Quadrant I. Quadrant II is a group of provinces with relatively low education budgets, coupled with large educational inequality. The province in Quadrant II is Papua Province. Quadrant III is a group of provinces with relatively low education budgets, but relatively even inequality in education. Provinces in Quadrant III include DKI Jakarta, West Java, Central Java, Yogyakarta, East Java, Banten, Bali, South Sulawesi and Southeast Sulawesi, South Sumatra, Aceh, North Sumatra, West Sumatra, Jambi, Bengkulu, Lampung, Bangka Belitung Island, West Kalimantan, Central Kalimantan, Central Sulawesi, West Nusa Tenggara, West Papua, Papua, Riau, Riau Islands, East Kalimantan and South Kalimantan. Quadrant IV is a group of provinces with relatively high education budgets and fairly even distribution of education. Provinces in Quadrant IV include Gorontalo, North Sulawesi, North Kalimantan, East Nusa Tenggara, West Sulawesi, North Moluccas and Moluccas.

The government budget for education spread across 34 provinces in Indonesia which is given to each province is still not evenly distributed, this can be seen based on the group of provinces that have relatively low and relatively high education budgets. Provinces that need to be considered are those in Quadrant II, namely Papua Province which has a low education budget and very high educational inequality compared to other provinces. This is caused by several factors; First, it is still difficult for the poor to access education services. Second, culturally the population is very tied to their culture so they are not easy to accept change. Third, structurally, natural conditions such as people living in the hills and far from the reach of government services are still difficult to access education services. Fourth, the limitations of educational facilities and infrastructure, both in terms of the limitations of teachers and the lack of supporting facilities such as transportation.

Baseline Controls

Model 4 poverty has a positive and significant impact on educational inequality. The higher the poverty rate, the higher the educational inequality. This condition occurs because when the poor prioritize work to meet the economic needs of their families rather than continuing their education. These results are in line with research (Adiningtyas & Budyanra, 2020; Banunu, 2021; Harahap et al., 2020; Soejoto et al., 2016). While Model 2 has a significant negative effect and models 1 and 5 show negative and insignificant results on educational inequality.

Models 1, 2, 3, 4 and 5 show that GRDP per capita has a positive and significant effect on educational inequality. The positive effect shows that the role of income per capita is not so important

in efforts to reduce educational inequality. The results of this study are in line with research conducted by (Soejoto, et al. 2016).

Model 2 shows that income inequality has a positive and significant effect on educational inequality. A positive sign indicates that income inequality can lead to high levels of educational inequality. This is because people with low incomes have limited access to education compared to people with high incomes. These results are in line with the research conducted by (Harahap et al., 2020). Model 5 shows a positive and insignificant relationship to educational inequality.

Additional Controls

Models 1, 2, 3, 4, and 5 show that education at the elementary, junior high, high school, and college levels has a negative and significant effect on educational inequality. That is, the higher the education, the lower the educational inequality. Achieving basic to tertiary education can increase the opportunity to earn higher incomes and can improve people's quality of life. The results of this study are similar to the research conducted by Digdowiseiso (2010) which was adapted from the research of Thomas (2000). According to him, the average length of schooling tends to reduce educational inequality. This means that the higher a person's education, it can reduce educational inequality.

CONCLUSIONS

Education is a central role in improving the quality of human resources that are able to encourage economic and social development which is the ideal of the nation's life to achieve prosperity. There have been many studies that discuss this issue related to addressing educational inequality. However, there are not many studies that examine educational inequality by combining various variables that affect educational inequality such as educational, social and economic factors in one research scope. On the other hand, the achievement of inclusive and equitable education for all communities is one of the targets in achieving the SDGs goals which are targeted to be achieved in 2030. With the increasing importance of achieving education that is equally accessible to all communities.

The role of the government is very decisive for educational attainment in Indonesia, especially in expanding access to education for all residents equally regardless of social, economic and political status. Improving educational facilities and infrastructure such as the availability of educators, adequate school facilities and taking into account the geographical and cultural conditions of the local community in accepting changes in the field of education, especially for remote areas which are very difficult to reach in accessing educational services.

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