THE CORRELATION BETWEEN PARENTS' EDUCATION AND EARLY CHILDHOOD EDUCATION ENROLMENT DECISIONS

Yostiana Bella Ulfa[1]✉, Sartika Djamaluddin[2]

Master of Economic Planning and Development Policy, Faculty of Economics and Business, University of Indonesia, Jakarta, Indonesia

DOI: 10.29313/ga:jpaud.v7i1.11828

Abstract

Early Childhood Education (ECE) is crucial for a child's school readiness, development, welfare, and future academic achievement. However, Indonesia is currently facing low participation of ECE students. This study discusses the parents' education, household characteristics, child development, infrastructure, and environmental characteristics associated with parents' decisions on ECE enrolment. This study uses a quantitative approach with probit regression. The data used for this research were from the 2020 Indonesia's National Socio-Economic Survey and Village Potential Survey. The results of this study indicated that parents' education had a positive and significant correlation with the parent's decision to send their children to ECE. The income per capita, the mother's job status, the father's job status, access to food for the household, and the number of household members, which are household characteristics, determine ECE enrolment decisions. Children's growth and development, the infrastructure of the ECE within the district/city, and the environmental characteristics such as residential classification and the regional area of residence are proven to be associated with ECE enrolment.

Keywords: Enrolment Decisions; Parents' Education; Household Characteristics.

✉ Corresponding author :

Email Address : yostianabella@gmail.com (corresponding address)

INTRODUCTION

Early Childhood Education (ECE) is paramount because it is the center of the human resource development strategy. Based on the Regulation of the Minister of Education and Culture of the Republic of Indonesia, ECE is a coaching effort aimed at children from birth to the age of six years old, which is carried out through the provision of stimulation of education to assist the physical and spiritual growth as well as the development so that the children are ready for further education. Early childhood education determines the history of a subsequent child's development and forms the foundation of their personality. ECE may improve a child's health and physical, and mental well-being. ECE will have a profound impact on their academic achievement in the future. In the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 146 of 2014, it is also stated that ECE develops the abilities and school readiness of the children. Nakajima et al. (2019) stated that school readiness is a crucial goal of ECE because it has a long-term impact on the child's academic success in the future. School readiness is a child's social-emotional readiness, self-regulation, a positive attitude toward learning, and basic literacy and numeracy skills.

Yamaguchi et al. (2018) found that ECE enrolment could reduce the risk of problematic behavior within children, such as hyperactivity, especially for children of mothers with a secondary to low-level education. In addition, ECE could improve the quality of childcare amongst mothers with a low-level education. ECE has a major ongoing impact on further education and a child's future life goals (Sylva et al., 2011). Based on the research of Bouguen, A., Filmer, D., Berkes, J. L., & Fukao, T. (2021), enrolling children in pre-primary education provides an opportunity for all children to obtain an education regardless of their social class, gender, disability, or even geographical setting. The impact of ECE on a student's academic achievement in the future has been proven through various studies. Khan et al., (2019) found that the ECE program had a massive impact on academic achievement at the elementary school level. There is ample evidence from various countries that investing in early childhood education programs had a large economic return, especially for children from economically disadvantaged backgrounds (Nores, M., & Barnett, W.S, 2010; Engle et al., 2011; Walker et al., 2011).

Based on information from the World Bank (2016), developing countries currently increase public investment in early childhood education. The Indonesian government needs to prioritize investment in preschool education to achieve Sustainable Development Goals (Nakajima et al., 2019). However, Indonesia is facing a low rate of ECE enrolment. Based on Table 1 below, the Java region from year to year has a higher enrolment rate for ECE compared to other regions. Maluku and Papua regions occupy the lowest rate each year. In the Draft Law on the National Education System, it is proposed to change the 9 Year Compulsory Education (grade 1 to grade 9) to the 13 Year Compulsory Education, which covers one year of preschool class, namely grade 0 and grade 1 to grade 12 which applies nationally. However, the government needs to consider whether compulsory education starting from grade 0 (preschool/ECE) is the most effective way to increase the participation of ECE students so that children can adapt and undergo a smooth transition toward the next education level with a more structured learning process.

Table 1. ECE Gross Enrollment Rate by Province

Province	2015	2016	2017	2018	2019	2020
Sumatra Region						
Aceh	28.43	29.99	27.31	31.76	31.76	29.21
North Sumatra	9.55	20.76	9.46	24.34	23.32	24.51
West Sumatra	26.88	26.58	26.38	30.22	30.39	29.87
Riau	26.28	24.77	22.17	29.31	25.71	25.61
Jambi	32.51	29.60	28.12	31.71	30.12	32.91
South Sumatra	23.49	20.78	21.82	25.43	24.45	26.24
Bengkulu	10.55	24.93	24.09	28.80	27.87	28.44
Lampung	32.53	31.05	30.41	33.20	33.40	35.13

Kep. Bangka Belitung	28.51	29.13	30.25	36.10	32.93	33.86
Kep. Riau	32.33	32.18	31.39	28.31	28.90	30.25
Java Region						
Jakarta	44.53	40.99	39.90	39.80	43.08	39.44
West Java	33.77	33.80	30.84	35.87	35.22	35.46
Central Java	46.20	45.59	45.61	49.77	48.72	50.24
Yogyakarta	70.11	68.47	69.14	69.80	67.75	67.46
East Java	52.89	51.90	51.85	56.90	55.70	56.24
Banten	28.24	27.77	28.89	29.77	28.45	30.44
Bali and Nusa Tenggara Regions						
Bali	28.55	28.83	27.30	35.49	32.32	31.81
West Nusa Tenggara	35.81	37.57	36.94	40.29	42.29	42.46
East Nusa Tenggara	23.42	25.27	27.44	32.58	30.87	32.72
Kalimantan Region						
West Kalimantan	15.84	16.47	18.51	22.47	20.90	22.69
Central Kalimantan	34.46	32.64	32.72	37.90	35.15	37.23
South Kalimantan	44.36	41.72	42.00	47.27	42.33	45.71
East Kalimantan	33.60	28.13	25.77	32.20	29.52	28.67
North Kalimantan	33.82	28.02	30.02	32.80	30.15	34.89
Sulawesi region						
North Sulawesi	25.88	27.30	26.40	31.78	30.70	32.85
Central Sulawesi	35.05	36.18	37.85	41.77	37.62	39.40
South Sulawesi	28.54	28.41	26.88	32.16	29.74	31.79
Southeast Sulawesi	26.45	29.53	26.63	31.17	34.69	34.62
Gorontalo	45.29	45.29	48.54	50.23	49.49	48.47
West Sulawesi	32.21	38.84	36.51	42.53	41.41	42.35
Maluku and Papua Regions						
Maluku	22.92	21.48	21.80	30.77	29.46	34.17
North Maluku	21.82	26.11	28.82	35.31	38.23	37.88
West Papua	27.74	25.73	23.33	27.39	27.93	26.45
Papua	14.24	12.44	10.68	13.17	11.66	11.47
Indonesia	**35.18**	**34.62**	**33.84**	**37.92**	**36.93**	**37.52**

Family is the first educational environment for children who have a strategic role in directing intelligence, personality, and readiness for life. Parents are role models for children, so the decisions and attitudes of parents greatly affect children's lives from an early age. Musgrave, C. B. (2000) found that children from educated families will follow the steps of their family education. Children can associate themselves with their parents' education. Educated parents are also likelier to get information about the importance of ECE for their children, so they are likelier to send their children to ECE. Early childhood is an individual still dependent on the adults around them. Parents are generally the closest adults to children. Therefore, the characteristics of parents become the most powerful determinant in a child's early life.

Greenberg (2011) found that the mother's education was a significant predictor of child participation in early childhood education and care programs, with the highest participation found among children whose mothers had higher education. This finding suggested that mothers who were more educated may value education more. The mother's consideration became dominant in early childhood life decisions, especially education-related ones. In Kenya, Ouma, W. O. F. (2018) showed the influence of parents' socio-economic status on pre-primary education enrolment decisions. Parents' educational level influenced child enrolment, so literate parents were likelier to enroll their children in school than illiterate parents. Mainye, M. J., Benson, O. C., & Benard, M. (2018) also conducted a qualitative study and concluded that fathers with higher education were aware of the benefits of ECE. UNICEF (2004) also stated that educated parents would be role

models for their children and would foster a positive attitude towards school in their children from an early age. Linking ECE participation with parents' education, household characteristics, child development, infrastructure, and environmental characteristics could help policymakers to have a better understanding of the factors related to ECE enrolment decisions.

Household characteristics found in previous studies, such as household income, parent's employment status, household size, and household food accessibility correlated with ECE enrolment decisions. Meurs, M., & Giddings, L. (2006) showed that economic difficulties were a factor that influenced preschool enrolment decisions. In Japan, Kachi, Y., Kato, T., & Kawachi, I. (2020) suggested that children from the lowest household income quintile were likelier to have difficulty enrolling in ECE. Giddings, L., Meurs, M., & Temesgen, T. (2007) in his research found that cultural and economic factors such as parents' income and employment status had a significant influence on household decisions to send their children to preschool. In Kenya, there was a study by Ouma, W. O. F. (2018) regarding the influence of parents' socio-economic status on enrolment decisions and children's participation in pre-primary education. The parent's employment status was closely related to the parent's opportunities to take care of children and pay school fees. Working parents tended to send their children to ECE so that their children would receive adequate care and education.

Kachi, Y., Kato, T., & Kawachi, I. (2020) also found that children with socio-economic deficiencies (mother's low education, non-Japanese parents, and a larger number of siblings) increased the risk of children not receiving early education. The literature supported the research of Thomas et al. (2004) regarding the number of siblings. In their research, they stated that poor households tried to protect investment in the education of older children at the expense of the education of younger children. The fulfillment of basic needs may be a priority compared to the fulfillment of education which incidentally had not been required by the government. Svec, J. J. (2011) stated that households with food insecurity were also less likely to enroll their children in school. Although the role of the family was dominant in determining the ECE enrolment decisions, the condition of the child's growth and development was also a consideration for the parents. Children's readiness to join an ECE was influenced by the condition of the child's functional development, such as vision, hearing, movement, cognitive, and emotional status. Alderman, H., Behrman, JR, & Menon, R. (2001) suggested that early childhood health and nutrition affected school enrolment. Children with developmental problems tended to have a higher dependence on parents, so children's development was a crucial consideration for people in enrolling their children in preschool.

In addition to socio-cultural influences, the research of Meurs, M., & Giddings, L. (2006) also showed results that changes in the number of schools affect preschool decisions. This finding was confirmed by Giddings, L., Meurs, M., & Temesgen, T. (2007) in their research with the result that access plays the most important role in the presence of pre-schoolers. Social policies to promote equitable access to ECE were needed to reduce socio-economic inequality in the future. Inequality in development that occurred in Indonesia needs to be researched for its impact on ECE enrolment decisions. Indonesia is an archipelagic country with an area of 5,180,053 m². Indonesia's geographical condition causes high development inequality. Differences in geographic and sociological characteristics between rural and urban areas in Indonesia may be a consideration for parents in sending their children to school.

Previous studies have captured that ECE is very important for the development and well-being of children, children's academic achievement in the future, and even a high level of economic return. However, the gross enrolment rate for ECE in Indonesia is still low. In previous studies, in various countries, it was found that parents played a major role in determining preschool decisions for children. It was necessary to conduct research based on the characteristics of Indonesian society regarding the correlation between the parent's education to ECE enrolment decisions. Therefore, the formulation of the problem posed in this study was: What is the correlation between the parent's education to ECE enrolment decisions? The research novelty is the use of Indonesian sample data, the correlation between the employment status of mothers and fathers as an interaction variable, the classification of residence, and the residential region/area where the family

lives as relevant to Indonesian conditions. So far, there has been no research conducted in Indonesia regarding the correlation of parents' education, considering household characteristics, child growth and development, infrastructure, and environmental characteristics presented thoroughly and are relevant to Indonesian conditions for ECE enrolment decisions.

REGRESSION MODEL

This study uses a quantitative approach with probit regression. The following is the model used in this study:

$$enroll_i = \alpha + \beta_1\,medu_i + \beta_2\,fedu_i + \beta_3\,quin_i + \beta_4\,mjob_i + \beta_5\,fjob_i + (\beta_4\,mjob_i * \beta_5\,fjob_i) + \beta_6\,food_i + \beta_7\,fmsz_i + \beta_8\,grow_i + \beta_9\,acsECE_i + \beta_{10}\,resi_i + \beta_{11}\,regi_i + \varepsilon_i \qquad \text{Eq. (1)}$$

The data used for this research are from the 2020 National Socio-Economic Survey (Susenas) and Village Potential survey results. The dependent variable used in this research is the ECE enrolment decisions (*enroll*). The data was taken through the Susenas questionnaire based on the questions regarding the preschool status of household members aged 0-10 years. The data is then processed in the form of a dummy variable. There are 2 (two) main independent variables in this study, the mother's education level (*medu*) and the father's education level (*fedu*) in dummy form. Primary education in Indonesia takes the form of Elementary Schools or other equivalent forms and Junior High Schools or other equivalent forms. Secondary education takes the form of Senior High School or other equivalent forms. Higher education includes diploma, undergraduate, master's, specialist, and doctoral education programs organized by universities.

Other factors associated with the dependent variables are used as control variables. Control variables are divided into four categories: household characteristics, child growth and development, infrastructure, and environmental characteristics. This division aims to identify the role of family conditions, children's conditions, infrastructure, and environmental conditions in preschool decisions. Variables included in household characteristics are per capita income (*quin*), mother's employment status (*mjob*), father's employment status (*fjob*), the interaction between parents' employment status (*mfjob*), family access to food (*food*), and household size (*fmsz*). Child growth and development consists of 1 (one) control variable in the form of child functional development (*grow*). Child development data is available for two years old and above household members. Thus, it will reduce the number of observations consisting of below two years old household members.

The infrastructure consists of ECE accessibility per one thousand residents in the district (*acspaud*). ECE access is the only continuous variable in this research model. Environment characteristics consist of the classification of residence (*resi*) in rural or urban areas, and the regional area (*regi*). The regional area is divided based on the Indonesian regional area. Java region as a base, consists of Banten Province, Jakarta Special Capital Region Province, West Java Province, Central Java Province, Yogyakarta Special Region Province, and East Java Province. Sumatra region consists of Nangroe Aceh Darussalam Province, North Sumatra Province, South Sumatra Province, West Sumatra Province, Bengkulu Province, Riau Province, Riau Islands Province, Jambi Province, Lampung Province, Bangka Belitung Province. Kalimantan region consists of West Kalimantan Province, East Kalimantan Province, South Kalimantan Province, Central Kalimantan Province, and North Kalimantan Province. Sulawesi region consists of the Gorontalo Province, West Sulawesi Province, Central Sulawesi Province, North Sulawesi Province, South Sulawesi Province, and Southeast Sulawesi Province. Bali Nusa Tenggara region consists of the Bali Province, West Nusa Tenggara Province, and East Nusa Tenggara Province. Maluku Papua Region consists of North Maluku Province, Maluku Province, West Papua Province, and Papua Province.

RESULTS

Table 2 presents a statistical summary of the research variables. The value of the ECE decision variable as the dependent variable is 0 for children who had never enrolled in an ECE and 1 for children who enrolled in an ECE. Parents with primary education as their highest level of education dominated the observations, which were 47.34% for mothers and 43.85% for fathers. In

the statistical summary table, the proportion of mothers who did not finish elementary school was less than that of fathers. In addition, more mothers had completed higher education than fathers.

Control variables are divided into four classifications: household characteristics, child development, infrastructure, and environmental characteristics. Household characteristics consisted of per capita household income quintile variables, mother's employment status, father's employment status, the interaction between parent's employment status, the status of ease of access to food for the household, and household size. The child's growth and development contained the status of the child's functional development. Infrastructure was measured based on ECE access per one thousand residents in the district of residence. Whilst environmental characteristics consisted of variable classification of residence and regional area of residence.

The lowest income quintile had the highest number of observations, and the value decreased with each increase in the quintile. The first quintile contained households with 20% lowest per capita income, and the fifth quintile contained the 20% highest per capita income households. The proportion of working and non-working mothers in the observations was almost equal. That was 49.81% for working mothers and 50.19% for non-working mothers. However, in the observations, the proportion of working fathers was dominating, which was 97.68% and 2.32% of non-working fathers. There were 76.44% of households with secure access to food and 23.56% with vulnerable access to food. It is known in Table 2 that 23.51% of the observations were large families, and 78.49% of the observations were small families.

Unlike the other variables, the number of observations on child development variables was 153,999 children. This dissimilarity was because the available data for child development variables were for ages two years and above, so automatically, a sample of children aged under two years (26,209 children) were excluded from this study since the variable was included in the regression. The mean of this variable was 0.9821557, meaning that children without functional developmental disorders dominated the observation of 98.22%. Meanwhile, children with developmental disorders amounted to 1.78% of the observations. ECE access per one thousand population in the district had a mean of 1.241385 with a minimum value of 0.0379435 and a maximum of 4.010269. Based on observed children's data, 39.19% lived in urban areas. While the observations spread 23.60% lived in the Java region, 33.20% in the Sumatra region, 10.46% in the Kalimantan region, 13.99% in the Sulawesi region, 8.02% in the Bali Nusa Tenggara region, and 10, 73% in the Maluku Papua region.

Table 2. Summary of Research Variable Statistics

Variables	Obs.	Mean	std. Dev.	Min	Max
Dependent Variable					
ECE Enrolment Decisions (enroll)	180,208	.4861882	.4998106	0	1
Main Independent Variables					
Mother's Education (medu)					
Not finished elementary school	180,208	.0912945	.2880283	0	1
Primary education	180,208	.4733641	.4992914	0	1
Secondary education	180,208	.3002475	.4583668	0	1
Higher education	180,208	.1350939	.3418248	0	1
Father's Education (fedu)					
Not finished elementary school	180,208	.0998513	.2998024	0	1
Primary education	180,208	.4384822	.4962025	0	1
Secondary education	180,208	.346827	.4759614	0	1
Higher education	180,208	.1148395	.3188291	0	1
Control Variables					

Variables	Obs.	Mean	std. Dev.	Min	Max
Household Characteristics					
Per Capita Income Quintile (quin)					
1st quintile	180,208	.2814248	.4496955	0	1
2nd quintile	180,208	.2359607	.4245989	0	1
3rd quintile	180,208	.1996804	.3997612	0	1
4th quintile	180,208	.1619628	.3684177	0	1
5th quintile	180,208	.1209713	.3260949	0	1
Mother's Employment Status (mjob)	180,208	.4981133	.4999978	0	1
Father's Employment Status (fjob)	180,208	.9767935	.1505593	0	1
Interaction of Mother's Employment Status and Father's Employment Status (mfjob)	180,208	.4847953	.4997702	0	1
Food Accessibility (food)	180,208	.7643612	.4243986	0	1
Household Size (fmsz)	180,208	.2351006	.4240628	0	1
Child Development					
Child Development (grow)	153,999	.9821557	.1323857	0	1
Infrastructure					
ECE Access per One Thousand Population (acspaud)	180,208	1.241385	.5249118	.0379435	4.010269
Environmental Characteristics					
Classification of Residence (resi)	180,208	.3919027	.4881765	0	1
Regional Area (regi)					
Java	180,208	.2359607	.4245989	0	1
Sumatra	180,208	.3319664	.4709203	0	1
Kalimantan	180,208	.1046235	.3060686	0	1
Sulawesi	180,208	.1398939	.3468779	0	1
Bali Nusa Tenggara	180,208	.0802073	.2716146	0	1
Maluku Papua	180,208	.1073482	.3095563	0	1

Based on Table 3, 92,593 children were never enrolled in an ECE, and 87,615 children enrolled in an ECE. This meant that 51.38% of the 180,208 observations were children that were never enrolled in an ECE, and 48.62% were enrolled in an ECE. The results of the descriptive analysis are presented nationally and in the form of percentages.

Table 3. Percentage of Children ECE Enrolment

Status of Children's ECE Enrolment	Frequency	Percentage
Never Enrolling ECE	92,593	51.38%
Enrolling ECE	87,615	48.62%
Total	180,208	100%

Based on the mother's education level in Table 4, the proportion of children attending an ECE was 42.12% from the mothers who had not finished elementary school, 47.09% of mothers with primary education, 50.71% of mothers with secondary education, and 53.72% of mothers with higher education. Mothers with at least secondary education (Senior High School) had more

than a 50% probability of enrolling their children. This table showed the higher the education level of a mother, the likelier her child was to attend an ECE.

Table 4. Percentage of Children Enrolling ECE Based on Mother's Education Level

Mother's Education	Children Never Enrolling ECE	Children Enrolling ECE
Not finished elementary school	57.88%	42.12%
Primary education	52.91%	47.09%
Secondary education	49.29%	50.71%
Higher education	46.28%	53.72%
Total	51.38%	48.62%

In line with the mother's education, the higher the father's education also tended to be as well, where the higher the probability that their child would attend an ECE (Table 5). Based on the father's education level, the proportion of children attending an ECE was 43.73% of fathers who had not finished elementary school, 46.94% of fathers with primary education, 50.83% of fathers with secondary education, and 52.58% of fathers with higher education. Like mothers, fathers who obtained at least secondary education (senior high school) also tended to send their children to an ECE. It can be concluded that the government needs to encourage minimum compulsory education up to secondary education level and equality of educational opportunities for women and men.

Table 5. Percentage of Children Enrolling ECE Based on Father's Education Level

Father's Education	Children Never Enrolling ECE	Children Enrolling ECE
Not finished elementary school	56.27%	43.73%
Primary education	53.06%	46.94%
Secondary education	49.17%	50.83%
Higher education	47.42%	52.58%
Total	51.38%	48.62%

Table 6 presents the percentage of children attending an ECE by household income quintile per capita. There were 41.61% of children from the first quintile, 47.85% of children from the second quintile, 50.49% of children from the third quintile, 53.17% of children from the fourth quintile, and 57.22% of children from the fifth quintile who were not enrolling in an ECE. Starting from the third quintile, parents had a probability of more than 50% or tended to choose to send their children to preschool.

Table 6. Percentage of Children Enrolling ECE Based on Per Capita Household Income Quintile

Quintile	Children Never Enrolling ECE	Children Enrolling ECE
1st	58.39%	41.61%
2nd	52.15%	47.85%
3rd	49.51%	50.49%
4th	46.83%	53.17%
5th	42.78%	57.22%
Total	51.38%	48.62%

The data showed different probabilities of parents' employment status. Based on Table 7, working mothers had a 52.16% probability of enrolling their children in an ECE. Meanwhile, non-working mothers only had a 45.10% probability of sending their children to an ECE.

Table 7. Percentage of Children Enrolling ECE Based on Mother's Employment Status

Mother's Employment Status	Children Never Enrolling ECE	Children Enrolling ECE
Unemployed	54.90%	45.10%
Employed	47.84%	52.16%
Total	51.38%	48.62%

Based on Table 8, working fathers were likelier not to enroll their children in preschool. Descriptive statistics on the relationship of the father's employment status need to be examined more deeply. In Table 2, the mean on the employment status of fathers showed that 97.68% of the respondents were working fathers. Therefore, the data distribution on the father's employment status was less balanced. It could be seen in the table that of the 2.32% of unemployed fathers, 47.51% were not enrolling their children in an ECE, and 52.49% were enrolling. While from 97.68% of working fathers, 51.47% had not sent their children to an ECE, and 48.53% of fathers had sent their children to an ECE.

Table 8. Percentage of Children Enrolling ECE Based on Father's Occupational Status

Father's Employment Status	Children Never Enrolling ECE	Children Enrolling ECE
Unemployed	47.51%	52.49%
Employed	51.47%	48.53%
Total	51.38%	48.62%

The security level of household food accessibility also showed an increased probability of children enrolling in an ECE (Table 9). Only 43.49% of children with food vulnerability attended early childhood education. Meanwhile, the probability increased to 50.20% for children with safe access to food. Access to food is a basic human need. It could be concluded that if the family's basic needs in the form of food are safe and fulfilled, families tend to send their children to an ECE.

Table 9. Percentage of Children Enrolling ECE Based on Household Food Accessibility

Food Accessibility	Children Never Enrolling ECE	Children Enrolling ECE
Vulnerable	56.51%	43.49%
Safe	49.80%	50.20%
Total	51.38%	48.62%

Household size might be a consideration for parents in a preschool decision. The number of family members decreases the total per capita income of a household. A large number of household members is also an alternative to supporting child supervision at home. Referring to Table 10, 50.14% of children from small families had never attended an ECE. Meanwhile, large families tended to have a larger proportion of children never enrolling in an ECE.

Table 10. Percentage of Children Enrolling ECE by Household Size

Household Size	Children Never Enrolling ECE	Children Enrolling ECE
Small Family (3 – 5 people)	50.14%	49.86%
Large Family (more than 5 people)	55.42%	44.58%
Total	51.38%	48.62%

Table 11 presents the percentage of children enrolling in an ECE based on the functional development of children aged 2 – 10 years. Children's growth and development were crucial considerations for parents in enrolling their children in an ECE. There were 58.95% of children with developmental disorders who had not been enrolled in an ECE. Meanwhile, only 42.87% of children without developmental disabilities had never attended an ECE. Although in Table 2, the mean of this variable was 98.22%, which meant that the number of children with developmental disorders was only 1.78% of the observations. In Table 11, it could be seen that when children had functional developmental disorders, parents tended not to enroll them in preschool. This developmental condition could increase the child's dependence on their parents. On the other hand, children who developed without delays tended to attend an ECE.

Table 11. Percentage of Children Enrolling in ECE based on Child Development

Child development	Children Never Enrolling ECE	Children Enrolling ECE
With Developmental Disorders	58.95%	41.05%
Without Developmental Disorders	42.87%	57.13%
Total	43.16%	56.84%

Table 12 showed that the percentage of children attending an ECE in the districts with low ECE access was 46.59%. However, the proportion of children who attended an ECE had increased to 51.60% in districts with high ECE access. The ease of access to an ECE for the community was associated with the parents' decisions to send their children to preschool. The distribution of ECE access classification was based on the mean of 1.241385. Districts with high ECE access were those whose access value was above 1.241385.

Table 12. Percentage of Children Enrolling ECE based on ECE Access per One Thousand Population

ECE Access per One Thousand Population	Children Never Enrolling ECE	Children Enrolling ECE
Low ECE access	53.41%	46.59%
High ECE access	48.40%	51.60%
Total	51.38%	48.62%

The characteristics of the environment were the factors that correlated with ECE decisions. Table 13 showed that children living in rural areas had a 46.26% tendency to attend an ECE. This finding meant that there were still 53.74% of children in rural areas who had never attended an ECE. Meanwhile, children who lived in urban areas had a higher tendency, 52.28%, to be sent to an ECE. People in rural areas had more difficulties to access public facilities to schools than they in urban areas. They also had difficulties due to geographical conditions.

Table 13. Percentage of Children Enrolling ECE Based on Classification of Residence

Classification of Residence	Children Never Enrolling ECE	Children Enrolling ECE
Rural	53.74%	46.26%
Urban	47.72%	52.28%
Total	51.38%	48.62%

Supporting the previous analysis, Table 14 showed that 56.25% of children from the Java region, 46.56% of children from the Sumatra region, 48.65% of children from the Kalimantan region, 52.35% of children from the Sulawesi region, 46.12% of children from the Bali Nusa Tenggara region, and 35.20% of children from the Maluku Papua region who used an ECE. After

the Java region, the Sulawesi region ranks second with the highest proportion of children attending an ECE, followed by the Kalimantan, Sumatra, and Bali Nusa Tenggara regions in third, fourth, and fifth places, respectively. Meanwhile, parents in the Maluku Papua regions had the lowest tendency among other regions to send their children to preschool. Development inequality in Indonesia proved that children who lived in the Java region were likelier to attend an ECE than those in other regions. The government needs to encourage the acceleration of development throughout the region evenly.

Table 14. Percentage of Children Enrolling in ECE based on Regional Area of Residence

Regional Area	Children Never Enrolling ECE	Children Enrolling ECE
Java region	43.75%	56.25%
Sumatra region	53.44%	46.56%
Kalimantan region	51.35%	48.65%
Sulawesi region	47.65%	52.35%
Bali Nusa Tenggara region	53.88%	46.12%
Maluku Papua region	64.80%	35.20%
Total	51.38%	48.62%

DISCUSSION

The goodness of fit test was carried out in this study to see how well the model explained the correlation between the independent variables and the dependent variable. In probit regression, the parameters used were Pseudo R2 or artificial *R-square*. It was known in Figure 1, the Pseudo R2 value of this study is 0.0420, which meant that the independent variables in the model could explain the dependent variable of 4.20%. A small Pseudo R2 value did not mean the model was not good enough. This small value happened because the probit regression used a value of 0 to 1. In the probit regression model, the important thing to note was the model significance indicator.

```
Probit regression                          Number of obs    =    153,999
                                           LR chi2(23)      =    8848.83
                                           Prob > chi2      =     0.0000
Log likelihood = -100872.67                Pseudo R2        =     0.0420
```

Figure 1. Probit Regression Results

Regression coefficient testing was carried out to analyze the overall feasibility of the model (F test) and individually (t-test) and the significance of the correlation to the dependent variable. Based on Figure 1, the Prob > chi2 = 0.0000 was less than 0.05. It could be concluded that, overall, all significant variables were related to ECE enrolment decisions. Meanwhile, to investigate the significance and the correlation between each independent variable to the dependent variable, a marginal value analysis was carried out using the average marginal effect.

Table 15 presents the interpretation of the probability marginal values of the independent variables in this study. Factors related to ECE decisions were divided based on the main independent variables and control variables which were then divided into 5 (five) parts. The first part consisted of parents' education as the main independent variable within this study. The second part consisted of household characteristic variables, which are income per capita, parents' employment status, food accessibility, and household size. The third part consisted of the child development variable. The fourth part consisted of the ECE accessibility variable. The fifth part contained variables of environmental characteristics which consisted of the classification of residence and the regional area.

Table 15. *Average Marginal Effect* of Factors Correlated with ECE Enrolment Decisions

Variable	dy/dx	std. Err.	z	P>z
Main Independent Variables				
Mother's Education (medu)				
Primary education	.0340333	.0048422	7.03	0.000
Secondary education	.0601627	.0052195	11.53	0.000
Higher education	.0567752	.0064686	8.78	0.000
Father's Education (fedu)				
Primary education	.0122115	.0046854	2.61	0.009
Secondary education	.0325424	.0049551	6.57	0.000
Higher education	.0208659	.0065149	3.20	0.001
Household Characteristics				
Per Capita Income Quintile (quin)				
Quintile 2	.0585509	.0036914	15.86	0.000
Quintile 3	.0904342	.0039555	22.86	0.000
Quintile 4	.1126469	.0043255	26.04	0.000
Quintile 5	.1511534	.0050008	30.23	0.000
Working Mother (mjob)	.0425607	.0171435	2.48	0.013
Working Father (fjob)	-.027898	.0133298	-2.09	0.036
Working Mom and Working Father (Interaction)	-.0124411	.0173371	-0.72	0.473
Food Accessibility	.022809	.0031746	7.18	0.000
Household Size (fmsz)	-.0132832	.0031634	-4.20	0.000
Child Development				
Child Development (grow)	.1624774	.0097271	16.70	0.000
Infrastructure				
ECE Accessibility per 1000 Population (acspaud)	.1270668	.0026794	47.42	0.000
Environmental Characteristics				
Classification of Residence (resi)	.0477231	.002964	16.10	0.000
Region of Residence (regi)				
Sumatra region	-.1241638	.0034641	-35.84	0.000
Kalimantan region	-.1247985	.0048266	-25.86	0.000
Sulawesi region	-.0554145	.0043559	-12.72	0.000
Bali Nusa Tenggara region	-.0971675	.0053209	-18.26	0.000
Maluku Papua region	-.2757896	.0048893	-56.41	0.000

Regarding the data, it was found that parents' education had a positive and significant relationship with parents' decisions to send their children to an ECE. Based on Table 15, mothers with primary education had a 3.40% greater probability than mothers who did not finish elementary school. Mothers who finished secondary and higher education had a 6.02% and 5.68% greater probability of sending their children to preschool than mothers who did not finish elementary school. The results of the tabulation of ECE decision data based on the level of the mother's education in Table 4 and the marginal value effect was in line with the findings of Greenberg (2011) that the mother's education was a significant predictor of children's participation in early childhood education and care programs with the highest participation found among children whose mothers were more educated.

Although the correlation was smaller than the previous one, the father's education remained an important factor in this. Fathers who finished primary education, secondary education, and higher education had greater probabilities of 0.12%, 3.25%, and 2.09% respectively to send their children to an ECE compared to fathers who did not finish elementary school. These results were

also following Table 5 and the opinion of Mainye, M. J., Benson, O. C., & Benard, M. (2018) that fathers with higher education realized the advantages of an ECE.

If examined more deeply, the correlation between the mother's education and preschool decisions is greater than the father's and the decisions. The parents' paradigm of the importance of ECE is determined by the parent's education level. Educated parents tended to have broader insights, so even though ECE was not yet compulsory in Indonesia, they believed that ECE was beneficial for their children. Increasing parents' education would encourage increased children's participation in ECE. Equal educational opportunities for women also need to be supported. In addition, the government also needs to instill the paradigm of the importance of ECE to the parents, especially mothers and expectant mothers.

The table of marginal effects showed that preschool decision was significantly correlated at the 1% level with the per capita income of household members in each quintile. The correlation increased as the income quintile increased. Data from Indonesia could be compared with the research by Kachi, Y., Kato, T., & Kawachi, I. (2020) in Japan, who suggested that children in the lowest quintile of household income in Japan were likelier to have difficulty enrolling in ECE. Families in the second, third, fourth, and fifth per capita income quintiles in Table 15 were respectively 5.86%, 9.04%, 11.26%, and 15.12% more correlated to educating their children in ECE than families in the lowest quintile, following the correlation in Table 6.

The results of the data processing showed that the mother's employment status had a positive and significant correlation at the 5% level on preschool decisions. Working mothers increased the probability of their children enrolling in ECE by 4.26%. This finding was in line with Table 7 and the opinion of Giddings, L., Meurs, M., & Temesgen, T. (2007) and Ouma, W. O. F. (2018) that parental employment status had a significant relationship with ECE enrolment. Working mothers wanted their children to receive care and education consistently, even if the kids were not with their mothers.

However, the table of marginal effects showed that the father's employment status had a negative correlation of -2.79% and was significant at the 5% level on ECE decisions. This result was probably because working fathers did not have enough time to accompany and facilitate their children to go to preschool. Based on Table 8, 53.63% of non-working fathers did not send their children to ECE, while 53.44% sent their children to ECE, unlike the case with the interaction between the employment status of both parents, which was insignificant at the level of 1%, 5%, or 10%. The mother's employment status had a more significant correlation than the father's employment status and the interaction of parents' employment status. The characteristics of preschool decision-making in Indonesian households were dominated by the role of the mother.

Svec, J. J. (2011), in his research, stated that households with food insecurity were also less likely to enroll their children in school. Household food accessibility showed a positive significant association at the 1% level on preschool decisions. Households with safe access to food would increase the probability of parents sending their children to ECE by 2.28%. Following Table 9 showed that the likelihood of children receiving ECE services was greater in families with access to safe food.

The percentage of children attending ECE based on household size in Table 10 showed that families with larger sizes tended to be less likely to send them to an ECE school. A study by Kachi, Y., Kato, T., & Kawachi, I. (2020) mentioned the number of siblings as one of the variables that determined ECE decisions. The data showed that families with more than 5 (five) members had a 1.33% lower probability of sending their children to an ECE. The correlation of the number of family members was significantly negative at the 1% level. The priority of preschool in large families might be shifted due to budget constraints. Thomas et al. (2004) found a decrease in education spending in poor households with more young children and suggested that poor households tended to protect their investment in the education of their older children. This result was in line with Table 10.

The condition of the child's growth and development is a crucial consideration for parents in preschool enrolment decisions. In the table of marginal effects, it was known that children's functional development had a positive and significant correlation at the 1% level on ECE

enrolment decisions. Children without functional developmental disorders had a 16.25% higher chance of getting ECE services than children with developmental problems. This finding was also seen in Table 11, which showed that the probability of children without functional developmental disorders was at a higher likelihood of being sent to ECE (57.13%) than children with developmental disorders (41.05%). This finding was in line with the research of Kachi, Y., Kato, T., & Kawachi, I. (2020) that children with health and developmental problems such as premature birth, congenital diseases, and developmental delays were at a greater risk of not receiving early childhood education.

This study found that infrastructure was correlated with ECE enrolment decisions. ECE Access per One Thousand Population in the district was positively significant at the 1% level. Giddings, L., Meurs, M., & Temesgen, T. (2007) stated that access had an important role in preschool attendance. The table of marginal effects showed that a 1-point increase in ECE Access per One Thousand Population would increase the probability of parents sending their children to ECE by 12.71%. This result is in line with the findings in Table 12.

Table 15 showed that the classification and regional area had a significant correlation at the 1% level to ECE enrolment decisions. Children residing in urban areas had a 4.77% greater probability of enrolling in ECE than those residing in rural areas. This finding is in line with the tabulation of data in Table 13. Based on Table 14, children living in the Java region had the highest opportunity (56.25%) to obtain ECE services compared to other regions, followed by the Sulawesi region 52.35%, Kalimantan region 48.65%, Sumatra region 46.56%, Bali Nusa Tenggara region 46.12%, and Maluku Papua region 35.20%. The table of marginal effects showed that children living in the regional areas of Sulawesi, Bali Nusa Tenggara, Sumatra, Kalimantan, and Maluku Papua had lower probabilities, respectively -5.54%, -9.72%, -12.42 %, -12.48%, and -27.58% in enrolling ECE, than children living in the Java region. Based on the descriptive statistics and tables of marginal effects, the Java region had the highest probability of children enrolling in ECE compared to the other regions, and the Maluku Papua regions had the lowest probability. This examination result is also in line with the ECE gross enrolment rate data in Table 1, wherein in 2020, the Java region had the highest average rate for ECE participation compared to the other regions, and the Maluku Papua regions had the lowest average rate. This finding was related to development inequality. Therefore, it is necessary to optimize the distribution of development in Indonesia.

CONCLUSIONS

This research found that parents' education had a positive and significant correlation to ECE enrolment decisions. The role of the mother's education was greater than the father's education in the decision. Although the correlation was smaller than the previous finding, the father's education remained an important factor in this decision. Economically advantaged children are likelier to obtain ECE than disadvantaged ones. The results showed that the mother's employment status had a positive and significant correlation with the decision. Working mothers wanted their children to obtain care and education when the kids were not with their mothers. Father's employment status had a negative and significant correlation to ECE decisions. This result was probably because working fathers did not have enough time to accompany their children to school. The interaction between the employment status of both parents was insignificant in ECE decisions. Household food accessibility showed a significant positive association with the parents' decisions. This finding meant that families with food vulnerabilities tended not to put their children into preschool. Household size showed a decreased likelihood of using ECE.

Children with developmental disorders also tended not to be sent to preschool, considering that these children were more dependent and required special attention. ECE access increases if the number of ECE in a child's neighborhood increases in line with the increase in population. Increasing ECE access will increase the probability of parents sending their children to ECE. Children who live in urban areas tend to have more opportunities in preschool. The results also showed that inequality exists between regions. Children living in the Java region have the highest

opportunity to attend ECE compared to children in other regions. The lowest probability of ECE schooling is experienced by children living in the Maluku and Papua regions.

POLICY RECOMMENDATION

To increase participation in ECE, the government can take various policies that have direct or indirect effects so that the children are ready to go to school at the next level. Increased parents' education is positively correlated with increasing children's enrolment in ECE. Parents with an education lower than a senior high school can be encouraged to continue their education through programs for dropouts to reach an equivalent formal education level at the Community Learning Activity Center. Intensification of free education programs and scholarships can increase education for prospective parents. Paradigm education about the importance of ECE also needs to be done so that people understand more about the crucial role of ECE before Elementary School.

The mother and father have a crucial role in the decision to send their children to ECE. The government needs to educate both parents about the importance of ECE. Wage subsidy assistance and social assistance for the first and second-income groups (quintiles) can help increase per capita household income and reduce food vulnerability rates to increase the tendency of parents to send their children to ECE. Regarding the research results that household size has a negative correlation with ECE enrolment decisions, the government needs to continue to launch the Family Planning Program to create a prosperous family by controlling the birth rate. The government also needs to encourage prevention so that the child's development from an early age will not be disrupted by strengthening health service units. Efforts to increase preschool access can not only be made by building ECE units in ECE-lack areas. It is necessary to increase the nominal government's assistance for ECE so that ECE operational costs are more affordable for the organizers and encourage the society to establish the ECE. When talking about equity, by the end of the day, the government needs to carry out equitable development through collaboration with various parties so that households in rural and urban areas, as well as in Java and outside Java, can have the same ease of access towards ECE.

From the supply side, the government may consider encouraging education improvements through the ratification of the Draft of the Regulation of the National Education System, especially regarding the 13-year compulsory education, which covers preschool, Elementary School, Junior High School, and Senior High School. Furthermore, the Smart Indonesia Card Program, which is currently enabled for elementary to higher education levels, is expected to be expanded to the preschool level.

ACKNOWLEDGMENTS

REFERENCES

Alderman, H., Behrman, J. R., & Menon, R. (2001). Child Health and School Enrollment: A Longitudinal Analysis. *The Journal of Human Resources*, *36*(1), 185–205. https://www.jstor.org/stable/3069675

Alderman, H., Orazem, P. F., & Paterno, E. M. (2001). School Quality, School Cost, and the Public / Private School Choices of Low-Income Households in Pakistan. *University of Wisconsin Press*, *36*(2), 304–326.

Barnett, W. S. (1995). Long-term effects of early childhood programs on social outcomes and delinquency. *The Future of Children / Center for the Future of Children, the David and Lucile Packard Foundation*, *5*(3), 51–75. https://doi.org/10.2307/1602367

Bouguen, A., Filmer, D., Berkes, J. L., & Fukao, T. (2021). Improving Preschool Provision and Encouraging Demand: Heterogeneous Impacts of a Large-Scale Program. *SSRN Electronic Journal, December*. https://doi.org/10.2139/ssrn.3967951

Engle, P. L., Fernald, L. C. H., Alderman, H., Behrman, J., O'Gara, C., Yousafzai, A., De Mello, M. C., Hidrobo, M., Ulkuer, N., Ertem, I., & Iltus, S. (2011). Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *The Lancet*, *378*(9799), 1339–1353. https://doi.org/10.1016/S0140-6736(11)60889-1

Giddings, L., Meurs, M., & Temesgen, T. (2007). Changing Preschool Enrolments in Post-Socialist Central Asia: Causes and Implications. *Comparative Economic Studies*, *49*(1), 81–100. https://doi.org/10.1057/palgrave.ces.8100178

Greenberg, J. P. (2011). The impact of maternal education on children's enrollment in early childhood education and care. *Children and Youth Services Review*, *33*(7), 1049–1057. https://doi.org/10.1016/j.childyouth.2011.01.016

Kachi, Y., Kato, T., & Kawachi, I. (2020). Socio-Economic Disparities in Early Childhood Education Enrollment: Japanese Population-Based Study. *Journal of Epidemiology*, *30*(3), 143–150.

Kementrian Pendidikan dan Kebudayaan. (2014). Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 146 tentang Kurikulum 2013 PAUD. *Kemendikbud Pendidikan Anak Usia Dini*, *2025*(1679), 1–67.

Khan, K., Tahir, T., & Aurangzeb, W. (2019). Effects of Early Childhood Education on Students' Academic Achievement at Elementary School Level. *Journal of Early Childhood Care and Education*, *3*(1), 58–75.

Mainye, M. J., Benson, O. C., & Benard, M. (2018). Influence of Parental Socio-Economic Status on Pre-Schoolers Access to Early Childhood Education in Kenya. *Novelty Journals*, *5*(1), 53–83.

Meurs, M., & Giddings, L. (2006). Decline in pre-school use in post-socialist societies: The case of Bulgaria. *Journal of European Social Policy*, *16*(2), 155–166. https://doi.org/10.1177/0958928706062504

Musgrave, C. B. (2000). Environmental factors affecting attitude towards science and mathematics. Journal of Educational Psychology, 91(1), 382-394.

Nakajima, N., Hasan, A., Jung, H., Brinkman, S., Pradhan, M., & Kinnell, A. (2019). Investing in school readiness: A comparison of different early childhood education pathways in rural Indonesia. *International Journal of Educational Development*, *69*(March 2017), 22–38. https://doi.org/10.1016/j.ijedudev.2019.05.009

Nores, M., & Barnett, W. S. (2010). Benefits of early childhood interventions across the world: (Under) Investing in the very young. *Economics of Education Review*, *29*(2), 271–282. https://doi.org/10.1016/j.econedurev.2009.09.001

Ouma, W. O. F. (2018). Influence Of Parents' Socio-Economic Status On Enrolment And Participation Of Children In Pre-Primary Schools In Busia County, Kenya.

Presiden Republik Indonesia. (2003). *Undang - Undang Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*. https://doi.org/10.24967/ekombis.v2i1.48

Svec, J. J. (2011). School Enrollment in Rural Tanzania: The Effect of Household Characteristics. *MPP Professional Paper*.

Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I., & Taggart, B. (2011). Pre-school quality and educational outcomes at age 11: Low quality has little benefit. *Journal of Early Childhood Research*, *9*(2), 109–124. https://doi.org/10.1177/1476718X10387900

The World Bank. (2016). *World Bank Group, UNICEF urge greater investment in early childhood development*. Press Release. http://www.worldbank.org/en/news/press-release/2016/04/14/world-bank-group-unicef-urge-greater-investment-in-early-childhood-development

Thomas, D., Beegle, K., Frankenberg, E., Sikoki, B., Strauss, J., & Teruel, G. (2004). Education in a crisis. *Journal of Development Economics*, *74*(1), 53–85. https://doi.org/10.1016/j.jdeveco.2003.12.004

Walker, S. P., Wachs, T. D., Grantham-Mcgregor, S., Black, M. M., Nelson, C. A., Huffman, S. L., Baker-Henningham, H., Chang, S. M., Hamadani, J. D., Lozoff, B., Gardner, J. M. M.,

Powell, C. A., Rahman, A., & Richter, L. (2011). Inequality in early childhood: Risk and protective factors for early child development. *The Lancet*, *378*(9799), 1325–1338. https://doi.org/10.1016/S0140-6736(11)60555-2