IMPROVING SCHOOL READINESS THROUGH EARLY CHILDHOOD EDUCATION IN RURAL AREAS OF INDONESIA

Commenced by:
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I. BACKGROUND

A World Fit for Children (May 10th, 2002) has been set by the UN General Assembly as a global movement to prioritize children in national development of all member states as an integral part to achieve the Millennium Development Goals (MDGs). For that, the resolution provides the following principles and objectives:

1. Put children first.
2. Eradicate poverty: Invest in children.
3. Leave no child behind.
4. Care for every child.
5. Educate every child.
6. Protect children from harm and exploitation.
7. Protect children from war.
8. Combat HIV/AIDS.
9. Listen to children and ensure their participation.
10. Protect the Earth for children.

The above principles and objectives clearly prescribe three important components in every intervention or program that affect children. First, all interventions/programs should be sensitive to what constitutes risks to child development. This includes poverty, discrimination and inequality, violence (including gender-based), health/survival compromising factors such as HIV epidemic, and ecological degradation. Second, protection of children should be a mandate to be carried out by state and related parties, namely communities and families. Third, children rights to be heard or listened to should be respected.

For many decades, Indonesian national development has been focusing on the improvement of the quality of the Human Resources. But it is only during the political reform at the end of the second millennium that explicitly focus on pre-school children (0-6 years old) based on life-cycle approach was adopted in the national development plan. According to this approach, to assure optimum benefits of early childhood intervention it is crucial to identify needs and gaps in services since the child is in inception. Unfortunately, for many years early childhood development programs have been managed and delivered by many sectors in the

government that leads into inefficiency and ineffectiveness due to overlaps and lack of cross-sectors integration and control. The most pressing problems with regard to Early Childhood Development (ECD) in Indonesia are limited coverage of existing ECD services, low participation and low quality of ECD services. The situation gets worse for the unreachable children, those who are disadvantage and vulnerable.

Even though the National Education System Law 20/2003 recognizes early childhood education as a stage preceding basic education, yet it is not part of the compulsory basic education. The national EFA target is 75% coverage of early childhood education services for 0-6 year olds by 2015, with an interim target of around 60% by 2009. However, the majority of pre-primary school age children do not have access to developmental and early learning opportunities. Only about 37 per cent of 3-6 year old children participate in structured developmental and early learning activities, with huge disparities between rural and urban areas. The largest proportions (70%) of children who are not attending ECD are from rural areas. Poverty and isolation as well as insufficient services limit the capacity of parents and community to provide good early child care for their children. Lack of national level funding for ECD is also another challenge for the improvement of ECD services at national level.

In 2006, the Indonesian Government (GoI) has started to develop a holistic ECD model that is suitable for the context of rural and poor communities in Indonesia aiming for preparing children go to primary school with sufficient level of school readiness. The program is also intended to assist GoI to reduce repetition rate at early grade of primary school and dropout rate at grade 1 and grade 2 of primary school, especially in rural and remote districts.

The ECD model has been developed from the *Posyandu* was originally established to provide health and nutritional care and immunization for pregnant mothers, infants and young children. The ECD center is now called *Taman Posyandu*, which integrates pre-school children's psycho-social and cognitive development with traditional *Posyandu* services.

A set of activities have been conducted at central level which include advocacy to ECD stakeholders, Training of Trainers for Master Trainers, KAP researcher training, and development of training and advocacy materials. In line with the decentralization policy, the above mentioned activities were then followed by activities at provincial and district levels in order to develop a comprehensive ECD model which provides ECD services to the children of 0-6 years old. To date, 363 ECD centers have been established and run in 23 districts in 12 provinces, benefiting about 22,180 children of 0-6 years and 44,360 parents. In line with the above introduction, and after four years implementing ECD program, there is a need to draw conclusions on the key program successes and challenges to date. Series of evidence based advocacy activities are still needed to be conducted in the coming years and the reliable evidence is expected to be generated from this evaluation, so that ECD best practices may be integrated into GoI's ECD programming, planning and budgeting.

II. OBJECTIVES

1. To measure the impact of the current ECD activities on children's school readiness when children reach early grade of primary school (grade 1).
2. To address and evaluate contributing factors related to capacity of the family and the school (teacher and school environment) which may affect school readiness.
3. To endorse the importance of equal rights for all children regardless their situation and condition including demographic factors.

III. Theoretical Framework

A. Early Childhood Development Programs and Education

To avoid confusion, it is important to distinguish Early Childhood Development (ECD) Programs and Early Childhood Education. ECD program generally refers to any interventions (e.g.: health, nutrition, and education) targeted at children in their earliest period of development and before their 8th birthday as the remarkable period of brain development. ECD practitioners are convinced that positive experiences and healthy nutritional input during early childhood will constructively affect the child's developing brain, general physical health, and how children relate to others. Developing positive and constructive intervention during early childhood has been empirically found to correlate with higher school achievements, productive workforce, resilient and responsible community members (National Scientific Council on the Developing Child - NSCDC, 2007). In many countries, ECD program has been recognized as part of an effective policy to fight poverty. Studies have repeatedly suggested that inequality of investment in health and education between regions with scarce and abundant resources have resulted in the quality of input children receive during their sensitive development period. Communities with lower investment are associated with higher negative child development related outcomes such as child mortality, school dropouts, juvenile delinquency, adolescent pregnancy, and soon (Jensen, 2009; Coley, 2007). In the national development perspective, it is important to view that ECD is an important part of community and economic development strategy (NSCDC, 2007).

Early Childhood Education (ECE) is an important component of ECD. ECE brings children very early in their development period into a semi-structured learning environment where they learn various scholastic, social, and life related skills to prepare them going into the world of formal education. In poor communities or nations, ECE has been an important part of ECD program that receives support from development agencies and monetary authorities. Investment in ECE has been recognized as the most promising and cost-effective development initiatives. ECE program in poor communities have been found to deliver long-term positive results in the quality of human resources (Barnett & Boocock, 1998). Coley (2002) in his longitudinal study of a national (USA) representative sample of 1998-9 kindergarten children reported that early stimulation both at home and in pre-school program is related to better reading proficiency and mathematical skills despites of SES and racial variation. This is consistent with other previous studies such as Duncan, Brooks-Gunn, and Klebanov (1994) and Essa (1996) who found that SES is a confounding factor in school related outcomes. Poverty and SES have been found as strong predictors of lower intelligence scores and problem behavior later in adolescents in the US, especially when coupled with poor neighborhood and problematic families. Although we cannot generalize poverty across states and nations, poverty always brings with it an ecology of uncertainty, frequent absences of parents, problem behaviors of children, helplessness, and malnutrition that are counterproductive to positive and constructive learning (Jensen, 2009). ECE program in poor or resource scarce communities is a way to get children into a more nurturing, protective, and stimulating environment as early as possible to counter balance the negative pressures of poverty or deprivation. In fact, a review of investment in high-quality ECE yields promising results, see the following article:

> *"At risk children who participate in high-quality, center-based programs have better language and cognitive skills in the first few years of elementary school than do similar children who did not have such experiences. They tend to score higher on math and reading tests, and they are less likely to repeat a grade, drop out of school, need special*

education or remedial services, or get into trouble with the law in the future. They also tend to complete more years of education and are more likely to attend a four-year college. These and other studies also found the most significant benefits accrued to low-income and minority children and those whose mothers had a high school education or less" (American Education Research Association, Fall, 2005 – p. 01-2).

What constitute a high-quality ECE program? It is well-recognized that institutional based program has a better chance of ensuring quality (than non-institutional based) through best-fitting of the learning environment, recruitment of trained teachers, developing standardized curriculum, packaging more comprehensive services, and ensuring transition and continuity. Institutional-based ECE also tend to be easier to get recognition, hence needed assistance, from local authorities and community leaders. Of course, quality of ECE should also come from a good assessment of children needs and the capacity of the community. Quality ECE program, however, should optimize the learning opportunity of children despite of existing limitations in the community (Jansen, 2009; AERA, Fall, 2005). Essa (1996) also pointed out that a quality ECE program should consider the ratio of adults who are able to give personal attention to each child, appropriate and broad learning activities in line with children's development phases, and warm and respectful interaction between adults and children. It is also important to pay attention to family participation as their support for their children growth and development is the key to successful ECE program. Quality engagement of parents in planning, implementation, and evaluation of ECE program should be encouraged (Essa, 1996).

B. School Readiness

School readiness is an important outcome of quality ECD and ECE programs. School readiness is a topic of interest for parents, teachers, and policy makers. The "school readiness" concept usually refers to particular qualities or competencies/skills (language, emotional adjustment and control, independence) physical fitness and well-being, and attitudinal requirements that enable children to socialize with their friends and follow instruction from a non-parental adult (Kagan & Rigby, 2003 cited in Centre for Community Child Health, 2008). Once these are acquired or achieved, a child is considered mature or ready for school. The UNICEF TOR refers to school readiness as comprising the following five child qualities, each with measurable/ observable indicators:

a. Physical Health and Well-being
b. Social Competence
c. Emotional Maturity
d. Language and Cognitive Development
e. Communication Skills and General Knowledge

Such conceptualization assumes that "readiness" is only relevant to the developing child and less to service providers, parents, community, and policy makers. Recent studies suggest that school readiness is a **systemic concept** rather than an individual-developmental concept alone. Parenting practices, cultural values and practices, and local or national policies do not necessarily support children to learn skills and competencies beyond their own homes and families. Therefore, school readiness constitutes (Centre for Community Child Health, 2008):

1. The children readiness for school
2. The school readiness for the children
3. The capacity and commitment of families and community to provide opportunities for their young children.

Through this conceptualization, it is not only parents and children, but the school, community, and the state are accountable. This is especially important when we put vulnerability, especially poverty, into the equation (Jensen, 2009). Children coming from vulnerable families may have more factors affecting their readiness to school. Factors in parenting, income, community norms and values and state laws may not be as supportive to these children as compared to children in the mainstream society. In a study conducted in Minnesota, USA (The Minnesota Department of Education, 2009) to assess school readiness at Kindergarten entrance, they found that family characteristics, such as income, education level, language used at home, race/ethnicity, and gender do have impacts on children's proficiency or maturity in the measured indicators (Brooks-Gunn & Markman, 2005).

C. The Characteristics of School Readiness

1. Children's Readiness

Morrison (2009) and Community Pediatric Review (2005) argue that there are several children's characteristics when they have started to go to school which can illustrate their school readiness. Those characteristics, relevant to the five dimension of school readiness spelled out by the National Education Goals Panel (1999) to reform basic education in the United States, are as follows:

a. Physical health and development: are consisting of children's physical development, health status and physical abilities alongside with age development. Children are expected to have capabilities on using writing tools and other activities that need hand-eyes coordination. Children are also ought to have good nutrition and physical health so they can optimally participate in the learning processes. Children who have disabilities and get sick occasionally would face difficulties in classes, thus these situations need to be considered as factors that might contribute on the school readiness.

b. Social and emotional development: are consisting of how children feel about themselves and others, their abilities to form relationships and the existence of interest and skills to have positive relationships with adults and other children. These skills will support the learning process in the class, as example learning through observation and to develop positive attitudes toward schools.

c. Learning attitudes: these are including independency, abilities to self-control, have curiosity, enjoy the learning processes, self-confidence and creativity. Children ought to be able to do the academic tasks with minimum supervision from adults.

d. Language and communication development: these are children's competencies to acquire both receptive and expressive language, either verbal or non-verbal abilities. These are important to understand conversations, follow any instruction and understand the academic resources. Words recognition will be the foundation to reading skills while vocabulary will be the foundation to communication skills and advanced cognitive skills.

e. Cognitive and general knowledge development: these are including general knowledge on environment, basic mathematics and simple problem solving skills. The recognition abilities on numeric, shapes, colors and sizes are parts of cognitive development. The experiences that children have got will help them to form the framework of general knowledge and advanced cognitive development.

In addition to the child-domain indicators, experts believe that school readiness also includes systemic domain indicators such as the school, family, community, and government care and education programs (Thompson & Goodman, 2009).

2. The Readiness of Schools and Teachers

Morrison (2009) argued that school readiness is the capacity of schools to educate all children, whatever their conditions are. There are times when children enter the next level of education without adequate stimulation and experiences sufficient to continue the learning process. Thus, the role of schools and teachers is to fulfill the gap between what children brought to school (input behavior) with school's upcoming demands and requirements for further learning. Readiness in the school-domain requires teachers and school administrators to understand and adapt demands and requirements of further learning with the strength and interest of each child. In other words, school readiness necessities the school as a learning institution to adapt their curriculum to the capacity of children and the teachers to help students in the learning process to achieve the learning objectives (Centre for Community Child Health, 2008).

3. The Readiness of Parents

Center for Community Child Health (2008) revealed that family and environmental context in which children live can influence their school readiness. Parents need to have good parenting skills, and provide learning experiences for children a home. McDevitt and Ormrod (2002) states that the family environment is a learning place for children. Through the family, children learn about relationships with other people, responsibilities, use of appropriate language, gained knowledge about their environment, and other learning opportunities that can be useful when they go to school. Van Steensel (2006) found that parents, who introduce book reading in the early age, will have children with good vocabulary when they are in grade 1 and 2. On the other hand, parents and their parenting practices may function as barriers that prevent further learning outside of the home. Language competency, development of child's autonomy, and fear of separation are a few examples that children may encounter in their own families that influence their chances to optimize opportunities for learning outside of their homes (see also Sheridan, Clarke, Marti, Burt & Rohlk, 2005).

4. The Readiness of Local Communities and Government

School readiness can also be affected by the practices of local cultures and policies. Cultures with certain language or livelihood practices may hinder their children to be integrated in mainstream schools. In Indonesia, this is the case with indigenous communities such as Baduy in West Java and Kerinci Tribe in Jambi, Sumatra and other such communities throughout the Indonesian archipelago. In many societies, minority status, poverty or other (stigmatized) factors may cause a child not being able to access important community and government resources and services. Children with disabilities and affected by stigmatized chronic illnesses such and HIV/AIDS and leprosy, for example, may have very hard times to be admitted in school facilities. On the other hand, communities and government with active and progressive early childhood care programs may provide advance learning activities and health benefits that prepare children better for further learning and education.

In connection with the proposed evaluation to support UNICEF and the Government in formulating strategies for developing ECE/D programs, the evaluation should consider the broader parameters. Children will be ready to continue their learning and education if the family, schools, communities and government provide environments and experiences that support the development of physical abilities, emotions, language, reading, and cognition in infants, toddlers and school age children (Barbarin & Wasik, 2009; Centre for Community Child Health, 2008).

IV. Methodology

In order to achieve the stated objectives, the assessment team used both quantitative and qualitative research methodologies. The details are as follows:

A. Data Collection Instrument

This assessment used an instrument that was designed and constructed by the Indonesian Educational Assessment Center (*Pusat Penilaian Pendidikan* - PUSPENDIK) from the Ministry of National Education (*Kementerian Pendidikan Nasional* - Kemendiknas). This instrument quantitatively measures scholastic and non-scholastic competencies of children in the first grade of the elementary school. Specifically, the scholastic competencies consist of six sub-scales, those are:

1. Pre-Reading: This subscale measures students' ability to recognize different forms, numbers, and different sounds in a language.
2. Pre-Writing: This subscale measures students' ability to copy different forms, alphabets, and to write simple words.
3. Pre-Mathematics: This subscale measures students' ability to recognize numerical concepts and counting.
4. Language Proficiency: This subscale measures students' ability to master Indonesian language (Bahasa) both in receptive and expressive manners.
5. Problem Solving: This subscale measures students' ability to solve simple problems.
6. Gross Motor Skills: This subscale measures students' ability to coordinate or control large muscles in the body.

The Non-scholastic competencies are divided into the following four subscales:

1. Independence: Measuring to what extent the children do not need assistance, especially when they are exploring the environment and doing things for themselves, as well as the needs of parental assistance.
2. Communication: The ability to express their mind in an acceptable manner by others.
3. Relation: The ability to relate, share, and work together with others, including indications of adequate self-adjustment.
4. Work ethics: The positive atitude that children demonstrate in completing task-oriented assignments.

After a try-out in PAUD *Sedap Malam* at Depok, the UAJ assessment team found a number of missing elements according to our model of school readiness. Those elements were:

1. Measurement on physical health.
2. Measurement on parents' characteristics.
3. Measurement on teachers' characteristics.
4. Indicators of a conducive learning environment.

Therefore, as affirmed by UNICEF and the sub-directorate of PAUD in MONE, the UAJ assessment team added several variables into the instrument. Those were as follows:

1. Measurement on physical health:
   - Anthropometric measurement through age, height and weight.
     This measurement be calculated in accordance with WHO Child Growth Standard (World Health Organization (WHO), 2006). Herewith, the UAJ team used body mass index (BMI) by age that is differentiated by gender.
   - Health notes in the last three months.

- Class absence history in the last three months.

2. Measurement on parents' characteristics:
   - Parents' marital status.
   - Parents' academic background.
   - Total income.
   - Total persons living in the same household.
   - Siblings' academic background.
   - Language used at home.
   - Total time spent with children (e.g.: leisure, ECE-related-activities).

3. Measurement on teachers' characteristics:
   - Teachers' qualifications related to competency for teaching in PAUD and elementary school.
   - Teachers' expectations of first-grade students input behavior.

4. Indicators of a conducive learning environment:
   - Total students in the ES.
   - Schools' facilities to support the learning process.
   - (In service) Trainings for teachers.

To enrich the analysis, everyday each assessor should make field-notes (observation notes). The field-note should capture events or situation that may be related to school readiness but have not been included in the instrument. Those are as follows:

- The Local Government Institutions, such as: Regional body for planning and development (*Badan Perencanaan Pembangunan Daerah* - BAPPEDA), Technical Service Centres (*Unit Pelayanan Teknis* - UPT).
- Applied data collection techniques.
- Challenges on data collection process, e.g.: limited access to targeted areas.
- Challenges on creating conducive learning environment in PAUD and ES.
- Supporting factors on creating conducive learning environment in PAUD and ES.
- Observed differences of children with and without ECD.
- Other related points.

Field notes should be discussed with team-mate in every assessment area and at the end of assessment it was discussed across teams.

B. Sampling Sites

The sampling sites were 11 Districts in Indonesia. Those are (1) districts of Aceh Besar, Nanggore Aceh Darussalam Province; (2) Pandeglang, West Java Province; (3) Sukabumi, West Java Province; (4) Wonosobo, Central Java; (5) Banyumas, Central Java; (6) Probolinggo, East Java Province; (7) Bone, South Sulawesi; (8) Lombok Tengah, West Nusa Tenggara Province; (9) Sikka, East Nusa Tenggara Province; (10) Belu, East Nusa Tenggara Province; and (11) Jayapura, . However, the targeted groups of respondents were in the rural areas of these districts because *Taman Posyandu* and PAUD locate in the rural areas.

The community in these districts faces many restrictions, not only geographically but also financially. The UAJ team used more than one type of public transportations to reach those areas. The location map can be seen in the Appendix 1.

C. Recruitment of Participants

There were two groups of children participated in the assessment. First was the intervention group these were children who participated in ECD programs either from *Taman Posyandu*, PAUD or other programs. The second or control group was composed of children who went to first grade in elementary school without ever participating in any ECD programs. Children who repeated first grade were not included in this assessment.

The UAJ team used a simple random sampling to recruit participants. Assessors were expected to get a list of first grade children. The list should contain information on (1) sex (female and male), and (2) interventions (*Taman Posyandu*, PAUD, TK or others, and no participation). Each child on the list will be given a specific number for randomized selection. Assessors then selected children randomly as many as needed for each Elementary School.

In practice, however, randomized selection was not possible due to several factors such as unavailability of the list, limited number of children and demographic situation. In such situation, assessor should try to get expected number of respondents proportionally. When this happened, it should be noted in field notes and reported to the team coordinator.

This assessment targeted at least 10 children from each group in every site, so at least there were 20 children participated in every site. Overall, we were able to recruit 269 first grade students in 11 selected Districts in Indonesia (*see appendix 2*). From among them, 208 students had been participated in ECD programs (ECD group) and 61 students without prior ECD programs exposures (Non-ECD group).

In addition, information data and information were collected from parents (fathers or mothers of our respondents), teachers and cadres (each school was represented by one first grade teacher and one cadres). Although we would like to have individual interviews with all of them, often times we engaged in group interviews.

D. Data Analysis

Data analysis was performed in accordance to the types of data and information. Quantitative data were analyzed descriptively through several statistical techniques. Means difference analysis had been performed through two-way ANOVA and t-test. Multiple regressions with stepwise technique had also been conducted subsequently to answer appropriate questions. On every statistical analysis, the UAJ assessment team used 0.05 or 95% confidence/ significance level. A correlation analysis was employed to understand the contribution of demographic data and characteristics of parents, teachers and schools to school readiness scores. Interview data were analyzed using appropriate rules in qualitative analysis (Miles & Huberman, 1994).

V. Results

A. School Readiness

In general, the students' performances in this assessment were unexpectedly high especially for Gross Motor Skills. Almost all students received maximum score. The Gross Motor Skills

subtest is only represented by one item. Looking at the results, it is clear that the item does not have a good discrimination power. Based on the data (*see appendix 3*), we may observe that students in Sukabumi District have achieved higher scores in Total Scholastic, Total Non Scholastic and Total Readiness, in contrast to Belu District. Overall, the data also suggests that children in Java have relatively higher readiness scores than children outside of Java.

B. Objective 1: The Impact of ECD Activities on School Readiness

The first objective is to analyze the impact of ECD activities to school readiness of first grade students. Thus, the UAJ team employed One-way ANOVA test to verify whether there are differences among ECD group and Non-ECD group. Additionally, the UAJ team also employed further analysis to significant factors that contribute to the School Readiness.

1. Means Differences on School Readiness between ECD group and Non-ECD group

Table 4 below shows the results of a t-test between the two groups of children. In all sub-tests (Non-Scholastic, Scholastic, and Total Readiness) students who were part of ECD program achieved significantly better scores than Non-ECD students. Further means analysis, their scores on Language Proficiency and Gross Motor Skills were not significantly different.

Table 1. Results of t-test between ECD and Non-ECD students

Subtests	df	t-value	Sig (two-tailed) p< 0.05
Total Readiness	267	3.730	0.000
Total Non Scholastic	267	2.838	0.005
Total Scholastic	267	3.402	0.001
Pre Reading	267	2.756	0.006
Pre Writing	267	2.260	0.026
Pre Mathematics	267	2.012	0.045
Language Proficiency	*267*	*1.677*	*0.095* [+]
Problem Solving	267	2.286	0.023
Gross Motor Skills	*267*	*-0.541*	*0.589* [+]

([+]) not significant p < 0.05

The results from quantitative analysis are in accordance with qualitative observation by the UAJ team as assessors. The differences between children who participated in ECD program in a number of domains with those who never participated were easily observed. Table 2 displays observed differences in seven domains:

Table 2. Observed differences between ECD and Non-ECD students

Observed domains	ECD	Non-ECD
Interaction with new strangers	More at ease – able to interact easily.	Awkward - shy and timid
Fine motor skill	Skillful in using and manipulating scissors and pencil	Demonstrate some difficulties in using scissors and pencil
Gross motor skill	No differences – developing normally	Developing normally
Instruction comprehension	Ability to comprehend longer instruction	Difficulties to comprehend longer instruction. Instructions have to be broken down into shorter statements.

Comprehension of Bahasa Indonesia	Ability to follow and understand instruction in Bahasa Indonesia	Instruction has to be translated into local dialect or language.
Work completion	Driven to complete given task in given period of time.	Not seriously motivated to complete given tasks within given period of time.
Observed domains	**ECD**	**Non-ECD**
Attachment with parents	At ease being separated from parents – able to complete tasks without seeking help from parents (confident).	At ease without parents around but when faced with challenging tasks they started to lose self-confident.
Autonomy	Quickly engaged in given tasks and able to deal with problem on their own.	Hesitation to deal with new tasks – looking at what their friends are doing before working on own tasks.

We may conclude, therefore, that there are significant contributions of ECD programs to school readiness of students. Our quantitative analysis and observation suggest that students who have been exposed to ECD programs are better prepared for school than those who have never been exposed to any ECD activities and programs.

2. Means Differences of School Readiness by ECD Institution (PAUD, TK and RA, and Non-ECD)

In this assessment, there are three ECD institutions which are *Taman Posyandu* or PAUD, *Raudatul Athfal* (RA) and Kindergarten (TK). However, as the number of students who had got intervention from RA was very small, the UAJ team has put students from RA and TK into one group. So there are two groups based on ECD institutions in this assessment, those are (1) PAUD and (2) TK&RA.

The graphic in the Appendix 4 illustrates that student who had intervened by ECD programs has more positive score distribution (top right) either in Scholastic or Non Scholastic. Especially for those students who had intervened by TK&RA (see the symbol of red square).

To go into details, the UAJ team has run One Way ANOVA to see the differences between students who had intervened from PAUD, TK and RA and also those who had not intervened (Non-ECD group). The data shows that there were significant differences between those groups (*see appendix 5*). The school readiness of students in ECD groups (PAUD and TK&RA) was significantly different with Non-ECD group either in Scholastic and Non-Scholastic domains. The significances were higher in TK&RA group.

Moreover, students in the TK&RA group had achieved significantly higher scores than Non-ECD group in all subtests of school readiness except in Language Proficiency and Gross Motor Skills. Similar results appear in the PAUD group. Students were achieved higher scores than Non-ECD group in all subtests except in Pre Mathematics and Gross Motor Skills.

Those differences were more obvious after the UAJ team puts the scores into norm of each subtest. Since the norm for school readiness has not been set out by PUSPENDIK the UAJ team has classified the scores into three different norms –mean, median and modus. From the three likely norms or passing grade for school readiness, we propose that for this report we use the mean to be the norm because this score is more sensitive to the variation of scores of

all students from different districts. In other words, the mean score would have greater discriminating power than median or modus.

Based on descriptive comparison (*see appendix 6*), students from the ECD group had achieved higher than scores of mean, median and modus. The percentages were greatly different. As an example, there were more than 50% of students in PAUD and TK&RA groups who had achieved scores above mean score, while there were only less than 40% from Non-ECD group. There were 56.03% students from PAUD group and 69.57% students from TK&RA group who were classified as ready to school. Meanwhile, there were only 36.07% students from Non-ECD group who can be classified as ready to school. These differences consistently appear in all subtests except Gross Motor Skills because this subtest has low discriminate factor. The item could not differentiate students who had optimal motor development with those who had not.

3. Contributing Factors on School Readiness

As explained earlier, school readiness is not only achieved by ECD programs. There are other contributing factors which the UAJ team tried to identify. Morrison (2009) argues that ECE is not only to prepare children to get ready with higher academic degree. It also to assist parents to the basic of good parenting, improve reading ability of children and parents, develop healthy and nutritious growth and development including health problems in daily life.

Therefore, the UAJ team has analyzed furthermore to find the contributing factors on school readiness, those are:

1. Health status of students.
2. Period of exposure to ECD programs.
3. Proficiency to Bahasa Indonesia.

As a preliminary illustration, the demographic characteristics of students in each district are quite different (*see appendix 7*). Wonosobo has the highest scores of Body Mass Index (15.36) and Aceh Besar has the lowest (13.17). On complete immunization, Probolingo has the highest percentage (96.3) and Belu was the lowest (4.0). Again, it seems children in Java received better health services that those outside of Java.

a) Health status of children.

In this assessment, the health status of children was measured by BMI (Body Mass Index), Immunization, and children absenteeism.

Based on the correlation analysis, it has been found that there is significant correlation between BMI and Total Readiness. Total Scholastic, Pre Reading and Pre Writing (*see Table 3 below*).

Table 3. Correlation between BMI and school readiness

Subtests	N	Pearson Correlation (r)	Sig (two-tailed) p< 0.05
Total Readiness	269	0.123	0.044 *
Total Non Scholastic	269	0.019	0.758
Total Scholastic	269	0.144	0.018 *
Pre Reading	269	0.151	0.013 *
Pre Writing	269	0.155	0.011 *

Pre Mathematics	269	0.115	0.060
Language Proficiency	269	0.084	0.170
Problem Solving	269	0.025	0.683
Gross Motor Skills	269	-0.073	0.234

(*) significant $p < 0.05$

In addition to that, we also found that children who receive complete immunization (BCG, DPT, polio, measles, and hepatitis) have significantly better scores on Total Readiness ($p < 0.02$) and Scholastic ($p < 0.04$) compared to children without complete immunization. Especially on Problem Solving sub-tests. No significant differences were found in sub-test scores based on children absenteeism ($p > 0.05$).

Although our analysis did not reveal much about the contribution of nutritional and health status of school readiness, we found that children with complete immunization did better than those who did not get complete immunization. We might assume that children with complete immunization were healthier and more resilient and, therefore, were able to optimize their learning opportunities (Santrock, 2010). We also believe that children who received complete immunization represent more caring families and. especially parents. Our assessment was not able to demonstrate that absenteeism negatively contributes to school readiness. However, we should note that we used the number of days when children were absent from ECD program in the past three months. The three months period may not long enough to capture indications of vulnerability among children. Nonetheless, we also believe that any health and nutritional input into ECD program would have positive and sustained impacts to readiness to school and general well-being of children.

b) Period of exposure to ECD programs

School readiness can be affected by maturity and the number of years children are exposed to ECD program. We tested our assumption that length of ECD exposure will significantly affects all scores, especially Total Readiness in comparison with the scores of Non-ECD students. The results were presented below in Table 13. Apparently we did not able to find any significant differences between different categories of period of exposure to ECD with the scores of Non-ECD students. When we look at the results, however, we noticed that the means differences tend to be larger the longer children are exposed to ECD program.

We explored different cut-off point to look for the minimum period of exposure to have meaningful impacts to school readiness. Through this analysis, it illustrates that student who had exposure for at least 1.5 years did better significantly on Total Scholastic, Pre Writing, Pre Math, and Language Proficiency than those who had never had any exposure to ECD classes/programs. The results in details can be observed in the Appendix 8.

c) Proficiency to Bahasa Indonesia

A one way ANOVA is employed to examine mean differences in all sub-tests between those did not understand Bahasa Indonesia and those who have workable understanding of the language. The results are presented in Table 4 below. The test found that National language proficiency is a discriminating factor in most sub-test scores except, understandably, for Gross Motor skills.

Table 4. Means differences by proficiency level to Bahasa Indonesia

Subtests	df	F-value	Sig.
Total Readiness	267	11.048	0.000 *
Total Non Scholastic	267	5.883	0.003 *
Total Scholastic	267	10.309	0.000 *
Pre Reading	267	5.458	0.005 *
Pre Writing	267	5.368	0.005 *
Pre Mathematics	267	6.912	0.001 *
Language Proficiency	267	19.214	0.000 *
Problem Solving	267	2.789	0.000 *
Gross Motor Skills	267	0.566	0.569

(*)significant $p < 0.05$

Since the number of those who did not understand Bahasa Indonesia is small (n=15). Further analysis is employed between those who have difficulties in Bahasa and those who have workable mastery of the language. The results (*see appendix 9*) suggest that children who were proficient in Bahasa Indonesia were significantly different (better) than the other two groups of children especially on Readiness and Scholastic Total scores.

Proficiency to Bahasa Indonesia has positive impact to school readiness for both Scholastic and Non Scholastic although the impact was higher in Scholastic. In many districts, Bahasa Indonesia is not use in daily conversation therefore there were limitations on using Bahasa Indonesia during the assessment even not in a crucial meaning. However, it is clear that proficiency to Bahasa Indonesia as the language of the assessment was being the contributing factor on school readiness.

Moreover, students with different proficiency levels to Bahasa Indonesia (not understand, understand and proficient) were significantly different in four subtests, those are Pre Reading, Pre Writing, Pre Mathematics and Language Proficiency. The reason is that in those subtests, proficiency is very important to understand the instructions. Especially in Language Proficiency subtest where children were asked to retell activities that they had been doing.

These results are in accordance with Morrison (2009) that to have language proficiency will not only give broader access to knowledge from environment but also boost the self-confidence to interact with others. In the end, it will not only improve their social emotional skills but also their cognitive abilities.

C. Objective 2: Contributing Factors on Family and School Readiness

1. Role of Family

From the outset, this assessment assumes that school readiness which is observed in the child's domain characteristics as proposed by UNICEF would be affected by the readiness of the family to support children in optimizing the benefits of learning activities in ECD program. According to Epstein (2002). rearing practices at home that support children learning in ECD program (such as the use of national language. repeating and exercising activities learned at ECD program. keeping children healthy. etc.), good communication with

ECD facilitators, and parents' input into the development or improvement of ECD program would help the program to develop and foster school readiness among children in the program.

Specifically, there are three characteristics as contributing factors to school readiness those are (1) parents' years of education, (2) time spent with children, and (3) total number of siblings. As described in following Table 13, on the average respondents had around 2 to 3 siblings and their parents only had 6 years of education. Meanwhile, most of fathers had 5 - 12 working hours per day and 3 - 6 hours per day for mothers. The detailed description of those contributing factors is described in the Appendix 10.

a) Parents' Education Level

Although school readiness is related to the numbers of year's fathers were educated. The overall level of education of parents was low. Many parents were not able to complete their elementary education. This may influence their contribution to school readiness as they might not be confident in helping children learning their ECD materials and delegated this responsibility to older siblings or ECD facilitators (Desforges & Abouchaar, 2003). We should note that, in spite of learning scholastic skills. they also need to learn customary and other values as well as socio-emotional skills that may not be taken care of by older siblings and non-parental care givers (Weiss, Caspe & Lopez, 2006). The significant contribution of fathers' years of education suggests that the higher the education of fathers, the higher the likelihood that children were reared in more supportive family environment.

b) Time Spent with Children

This assessment indicates that the longer the mother works outside of their homes, the higher the Non-scholastic scores of children. One of the interpretation of this result would be that while mothers were working outside of the homes, children we able to optimize their social and emotional learning opportunities under alternative caregivers such as extended family members or neighbors (children are being cared collectively in closely knit communities such as in most districts in Indonesia). They manage to deal with peers as well as with culturally expected caregivers (Weiss, *et al.*, 2006).

Another way of interpreting this result is that according to our observation, many parents (mothers) took their children with them while working outside of their home. In the workplace, children were able to play with his/her peers and being taken care of by their mothers and other caregivers. It is also possible that parents (mothers) who were not able to care for their children due to working outside of the home, tried to make up their time with their children when they were home. Therefore, although working mothers have shorter time to care for their children. They may have better quality of relationship with their children and are more aware to review what their children have learned in ECD program. Working mothers tend to have more concerns over their children achievements (Weiss, *et al.*, 2006).

c) Number of Siblings

This assessment found that the higher the number of siblings at home, the lower the readiness scores. This finding goes along with the time available for parents to process and facilitate learning opportunities at home and from ECD program. More responsive parents are related to more positive results in school readiness (Weiss, *et al.*, 2006). Our interviews also revealed that one of the reason that parents were not able to send their children to an ECD program

was that they were busy taking care of many children at home. The higher the number of siblings at home the busier the parents and the less likely parents will have time to take children to ECD program. Spacing and controlling number of children may be an important issue that affects parents' readiness to send children to early stimulation.

d) Parents' income

This study did not found any significant relationships between income of parents and school readiness. This means that despite of how much parents earned for their livelihood, children may be intrvened by the community such as through the early child development program to gain positive skills that contribute to school readiness.

2. Role of School

Morrison (2009) argued that school readiness is the capacity of schools to educate all children, whatever their conditions are. The UAJ team found out that qualified and well-trained teachers have higher self-confidence on their works. It means training for teachers is also a contributing factor of school readiness as it will fulfill the gap between what children brought to school (input behavior) with school's upcoming demands and requirements for further learning. It is important for teachers to have the ability to identify students' capacities and facilitate them to be ready.

We also found that it is necessary to have highly-creative-cadres to improve the learning module. It is also important that cadres need to allocate special time to assist the families during the period of learning at ECD institutions. Non-integrated childhood education and training for parents lead to minimum participation of parents to children's education.

Enthusiasm and strong commitment to teaching children are very important contributing factors. In several PAUD, several cadres tried to consider different alternatives learning methods. The UAJ team observed that cadres and concerned community members were continuously thinking about alternative learning processes as they realized that had only limited facilities to maximize the output. Similarly, in the elementary schools, teachers and headmasters were responsible for the learning programs. As an example, every evening first grade students who still have difficulties on reading and writing will be assisted in a study group with parental active involvement.

Language used either in PAUD or elementary school will impact students' proficiency on Bahasa Indonesia. Quantitative results show that students with proficient Bahasa Indonesia will have higher readiness. Based on qualitative observation, only a few of cadres and elementary teachers spoke Bahasa Indonesia during the learning process. Therefore, students' proficiency on Bahasa Indonesia was not optimal and affected their readiness. Bahasa Indonesia can be the second language. For example, teachers might give the instruction bilingually, first with local language and then with Bahasa Indonesia so students can improve their Bahasa Indonesia proficiency.

3. Role of Community

Earlier we posited that school readiness would also be related to certain characteristics of the community where children live. In this assessment we were able to interview parents and teachers on the role of the community. ECD facilitators (cadres) and community leaders played very crucial role in the success of an ECD program and, hence, school readiness. We found that community leaders in the districts for this assessment had been very pro-active in

promoting ECD program in their respective communities. ECD cadres were not only facilitating learning activities for children, but were also involved actively in promoting early stimulation and care in the community.

Moreover, there were districts where the communities prohibit their children to participate in ECD programs because some known activities, such as singing, are not in accordance with certain religious practices. In this case, the role of cadres has been very important in providing information to help parents understand certain activities and the importance of education. In some other districts, UAJ team found that some parents were very concerned that they won't be able to provide a good and higher education for their children. This was especially expressed by parents participated in the *Posyandu* program.

Beside cadres, involvement from religious leaders and community leaders are also expected to assist parents and support education programs. Many parents acknowledged that they sent their children to ECD program because they were invited by other parents and urged by community leaders to participate in the program. In many instances we found stories of children being picked up by cadres and community leaders and/or neighbors when parents were not able to take their children to an ECD program by themselves. something that happened elsewhere (Epstein, 2002).

4. Other Factors

We need to note that ECD is an integrated program targeted not only to children but also to parents. It is also important to remember that early childhood program should be aimed at helping children to develop all aspects of development (physical health and nutrition. cognitive. social. emotional. moral and spiritual (Essa, 1996). As most Indonesian parents are more familiar with the education component in early childhood intervention, there is a risk of and ECD program to be easily turned into and Early Childhood Education program with very limited, more cognitively oriented program. As such, and ECD program would not provide extra benefits to children coming from poor communities. A good ECD program should be able to help children in poor communities to get access to primary health care and treatment – as currently delivered through *Posyandu* - as well as to early education stimulation. In other words, children in poor communities need assistance to stay fit and healthy to be able to catch up with their peers in more affluent communities. It is very crucial to educate parents and community leaders about the true nature of an ECD program. In addition, it is also important to keep ECD as an integrated and cross-sectors program.

Local policies have crucial impacts to ECD programs. In Probolinggo, for example, there was a policy that PAUD is only for those below 4 years old and afterward students should continue to TK. Therefore, there was a clear role differentiation between PAUD and TK to minimize rivalry.

VII. CONCLUSION

Our analysis and discussion bring us to the following conclusions:

1. Exposure to early childhood development program significantly helps children with developing psychosocial and cognitive competencies relevant to readiness to school.
2. Children need to be in an early childhood development program for at least 1.5 year to gain significant benefits in school readiness.
3. School readiness is related to a number of important contextual factors. such as:

a) Family support, including parents' level of education, total time spent with children. and number of siblings. These factors apparently can optimize learning activities of children in any ECD program.

b) Community readiness: the participation of cadres, community leaders, and school officers who play very crucial roles to bring children and sustain their participation in ECD program.

c) Health and nutritional status of children, which suggests that *Bina Keluarga Balita* Program (Parent-Child Program - BKB) should be integrated as a part of the early childhood interventions.

4. Proficiency in Bahasa Indonesia influences significantly how children responded to the school readiness measurement. However, the current instrument would need further examination on its discriminating power, especially Gross Motor Skills and Language Proficiency.

VIII. RECOMMENDATIONS

1. Early childhood intervention does bring positive consequences that help children ready for school (formal education). Therefore, this intervention should be maintained, improved, and scaled-up. It is important to note, however, that such intervention should not lose perspective of its primary objective to help children to be ready to engage in formal education but at the same time to prevent children from malnutrition and from common childhood infectious diseases as well as to help develop psycho-social skills. Considering that this early childhood intervention is targeted toward poor communities, it should be considered that the *Bina Keluarga Balita* program be an integral part of the intervention. This program has been initiated by community members and supported by local authorities. Local investment in ECD program, therefore, should be encouraged and scaled-up.

2. To enjoy the benefits of ECD intervention and to scale up its coverage. we would like to note the following:

    a. The program should maintain and sustain the primary health care component. This is crucial for children and their families from poor communities.

    b. Bahasa Indonesia should be encouraged as the language of communication early on in ECD program. This is especially important because children are getting older and expected to go to the formal education where the national language is used.

    c. Parents' participation should be appreciated but, at the same time, to be watched carefully as they may forced ECD program to concentrate only on scholastic skills (especially reading. writing. and mathematics) and disregard psycho-social competencies.

3. As indicated by the results of this assessment, children have to participate in ECD program for at least 1.5 years before they gain significant benefits in school readiness. This means that children have to be in the program early (may start at 3 years old) to actually benefit from the existing services.

4. It is crucial that ECD program be scaled-up to cover more children in poor communities. Investment from local authorities should be encouraged because ECD program should be viewed as integral part of community development. The long-term benefits will be

enjoyed by no other than the community itself. To encourage optimal participation. ECD facilities should be established in accessible and safe locations.

5. For future assessment, the School Readiness Instrument should examine its discriminating power, especially the Gross Motor Skills and Language Proficiency Sub-tests.
    a. The Gross Motor Skills sub-tests should be able to include other activities as suggested by The Minnesota Department of Education (2009), such as independent self-care, coordinated movement in simple tasks, and eye-hand coordinated movements.
    b. Sub-test on Language Proficiency, should have simpler instructions in addition to "Tell a story" to help assessors to distinguish between children who are struggling with Bahasa Indonesia and those who are more proficient. Although story telling is a good instruction, many children who are proficient in Bahasa Indonesia are limited in their vocabularies.
    c. On the Auditory part of Pre Reading sub-test, the instruction should be reconsidered ("phrase") to ensure that when children respond incorrectly the assessor could assign with confident whether it is auditory or mere misunderstanding of the instruction.

6. To scale-up ECD program, we should be able to establish a system of recruitment, in-service training, and interesting remuneration/incentive for ECD cadres. Currently, there is no such system. Many cadres did not receive any financial support from local authorities or sectors' programs. Without an established system. It would be very difficult to scale-up and sustain the program.

VIII. RECOMMENDATIONS

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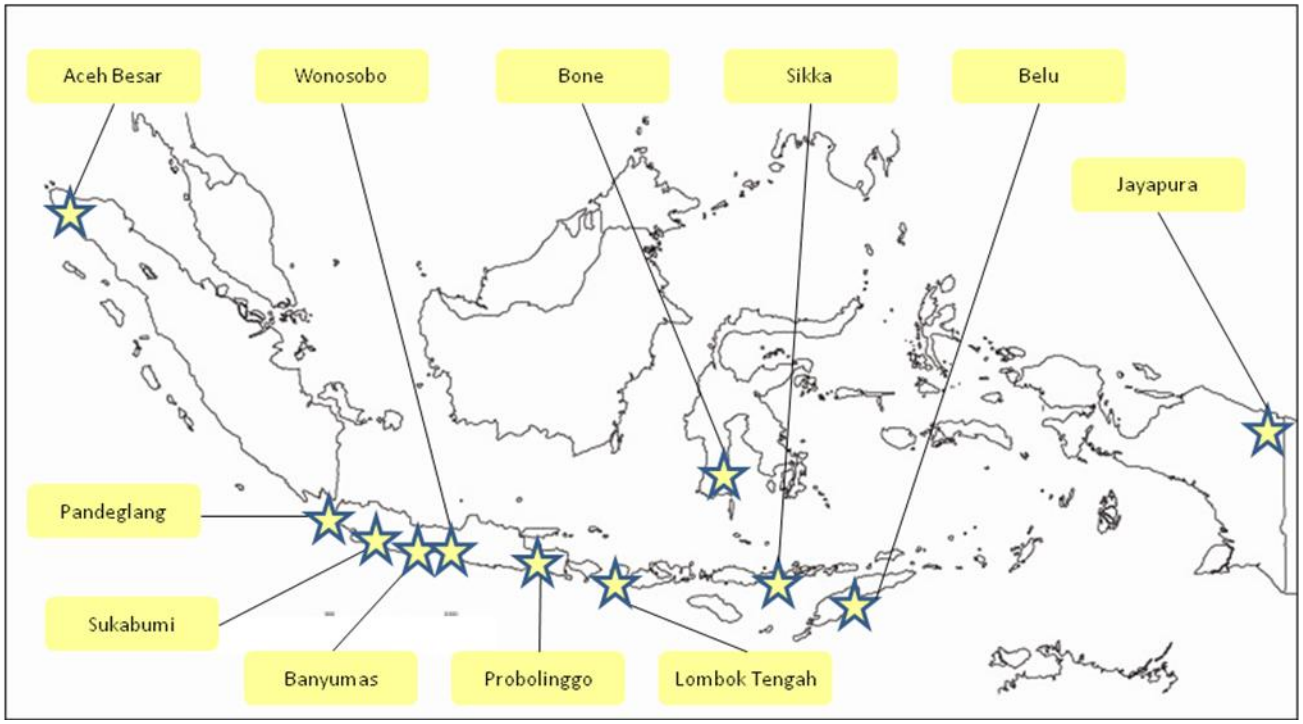
Appendix

Appendix 1. Research sites

Figure 1. Research sites



Appendix 2. Total Respondents per districts, sex and intervention programs

Table 5. Total Respondents per districts, sex and intervention programs (n)

Districts	Sex		Intervention			Intervention		Total
	Male	Female	PAUD	TK/RA	Non-ECD	ECD	Non-ECD	
Pandeglang	11	11	9	5	8	14	8	**22**
Sukabumi	11	10	11	4	6	15	6	**21**
Wonosobo	13	12	12	6	7	18	7	**25**
Banyumas	10	12	11	5	6	16	6	**22**
Probolinggo	13	14	18	7	2	25	2	**27**
Bone	14	7	12	5	4	17	4	**21**
Lombok Tengah	12	15	10	16	1	26	1	**27**
Sikka	9	16	10	10	5	20	5	**25**
Belu	12	13	13	4	8	17	8	**25**
Jayapura	13	13	17	3	6	20	6	**26**
Aceh Besar	10	18	11	9	8	20	8	**28**
Total	**128**	**141**	**134**	**74**	**61**	**208**	**61**	**269**

Appendix 3. Means differences of School Readiness subtests per Districts

Table 6. Means differences of School Readiness subtests per Districts

Districts	Pre Reading (max. = 8)	Pre Writing (max. = 16)	Pre Mathematics (max. = 13)	Language Proficiency (max. = 10)	Problem Solving (max. = 8)	Gross Motor Skills (max. = 2)	Total Scholastic (max. = 57)	Total Non Scholastic (max. = 33)	Total Readiness (max. = 90)
Pandeglang	6.23	10.77	12.45	8.73	4.14	2.00	28.55	42.32	72.86
Sukabumi	7.14	13.14	12.67	8.81	5.29	2.00	31.19	47.05	80.24
Wonosobo	6.72	12.52	12.84	9.04	4.72	2.00	29.36	45.48	76.84
Banyumas	5.73	11.05	12.00	8.41	4.32	1.95	30.39	41.50	73.84
Probolinggo	6.96	12.26	12.44	9.26	5.22	2.00	28.96	46.15	77.11
Bone	6.33	11.05	12.76	9.00	5.81	2.00	29.86	44.95	76.81
Lombok Tengah	5.74	11.26	12.37	8.44	5.15	2.00	28.67	42.96	73.63
Sikka	5.48	11.08	12.64	8.36	4.04	2.00	28.28	41.60	71.88
Belu	5.16	11.44	12.28	9.20	2.96	2.00	27.58	41.04	70.62
Jayapura	6.00	10.19	12.04	9.19	4.81	2.00	29.53	42.23	73.76
Aceh Besar	5.93	9.68	11.61	8.79	4.71	2.00	29.70	40.71	72.41

= highest score
= lowest score

Appendix 4. Scores distribution of Total Scholastic and Total Non Scholastic

Graphic 1. Scores distribution of Total Scholastic and Total Non Scholastic

Appendix 5. Means differences of students who participated in ECD program by institutions

Table 7. Means differences of students who participated in ECD program by institutions

Subtest		Means Differences	
		PAUD	TK & RA
Total (n)		**134**	**74**
Total Readiness	Means differences (with Non-ECD)	3.620 *	5.499 *
	Sig.	0.003	0.000
Total Non Scholastic	Means differences (with Non-ECD)	0.903 *	1.453 *
	Sig.	0.028	0.002
Total Scholastic	Means differences (with Non-ECD)	2.718 *	4.060 *
	Sig.	0.007	0.000
Pre Reading	Means differences (with Non-ECD)	0.608 *	0.688 *
	Sig.	0.014	0.013
Pre Writing	Means differences (with Non-ECD)	0.833 ^	1.544 *
	Sig.	0.058	0.002
Pre Mathematics	Means differences (with Non-ECD)	0.236	0.453 *
	Sig.	0.153	0.015
Language Proficiency	Means differences (with Non-ECD)	0.262 ^	0.209
	Sig.	0.090	0.225
Problem Solving	Means differences (with Non-ECD)	0.845 ^	1.166 *
	Sig.	0.059	0.020
Gross Motor Skills	Means differences (with Non-ECD)	0.000	0.014
	Sig.	1.000	0.201

(*) significant $p < 0.05$
(^) significant $p < 0.10$

Appendix 6. Categorization of students' achievement in each subtest by mean, median and modus

Table 8. Categorization of students' achievement in each subtest by *mean*, *median* and *modus*

Subtest	Category			Prior PAUD students with scores above…			Prior TK & RA students with scores above…			Non-ECD students with scores above…		
	Mean	*Median*	*Modus*	*Mean*	*Median*	*Modus*	*Mean*	*Median*	*Modus*	*Mean*	*Median*	*Modus*
Total School Readiness (max. = 90)	74.44	45.00	78	80 (59.70%)	134 (100.00%)	55 (41.04%)	49 (66.22%)	74 (100.00%)	34 (45.95%)	22 (36.07%)	61 (100.00%)	14 (22.95%)
Total Non Scholastic (max. = 33)	29.23	16.50	31	71 (52.99%)	134 (100.00%)	37 (27.61%)	50 (67.57%)	74 (100.00%)	23 (31.08%)	26 (42.62%)	61 (100.00%)	11 (18.03%)
Total Scholastic (max. = 57)	43.21	28.50	49	79 (58.96%)	128 (95.52%)	20 (14.93%)	45 (60.81%)	73 (98.65%)	12 (16.22%)	23 (37.70%)	58 (95.08%)	7 (11.48%)
Pre Reading (max. = 8)	6.12	4.00	8	66 (49.25%)	114 (85.07%)	0 (0.00%)	35 (47.30%)	65 (87.84%)	0 (0.00%)	19 (31.15%)	44 (72.13%)	0 (0.00%)
Pre Writing (max. = 16)	11.28	8.00	13	72 (53.73%)	115 (85.82%)	23 (17.16%)	46 (62.16%)	70 (94.59%)	17 (22.97%)	31 (50.00%)	45 (72.58%)	10 (16.39%)
Pre Mathematics (max. = 13)	12.36	6.50	13	87 (64.93%)	134 (100.00%)	0 (0.00%)	52 (70.27%)	74 (100.00%)	0 (0.00%)	32 (52.46%)	61 (100.00%)	0 (0.00%)
Language (max. = 10)	8.84	5.00	9	106 (79.70%)	132 (99.25%)	30 (22.56%)	60 (81.08%)	73 (98.65%)	18 (24.32%)	42 (68.85%)	60 (98.36%)	10 (16.390%)
Problem Solving (max. = 8)	4.64	4.00	8	77 (57.46%)	77 (57.46%)	0 (0.00%)	47 (63.51%)	47 (63.51%)	0 (0.00%)	26 (42.62%)	26 (42.62%)	0 (0.00%)
Gross Motor Skills (max. = 2)	1.99	1.00	2	134 (100.00%)	134 (100.00%)	0 (0.00%)	73 (98.60%)	73 (98.60%)	0 (0.00%)	61 (100.00%)	61 (100.00%)	0 (0.00%)

Appendix 7. Students' characteristics

Table 9. Students' characteristics

Districts	Total	Sex		Intervention			BMI (mean)	Completed Immunization	Proficiency to Bahasa Indonesia			Period of Exposure to ECD (modus)	
		Male	Female	PAUD	TK & RA	Non-ECD			Not Understand	Understand	Proficient	Duration	Not known
Pandeglang	**22**	11	11	9	5	8	14.27	40.9%	0.0%	72.7%	27.3%	1.5- 2 year (27.3%)	36.4%
Sukabumi	**21**	11	10	11	4	6	14.05	52.4%	4.8%	66.7%	28.6%	6 mo – 1 year (28.6%)	28.6%
Wonosobo	**25**	13	12	12	6	7	15.36	76.0%	0.0%	24.0%	76.0%	1.5 – 2 year (60.0%)	8.0%
Banyumas	**22**	10	12	11	5	6	15.18	45.5%	0.0%	100.0%	0.0%	2.5 – 3 year (36.4%)	31.8%
Probolinggo	**27**	13	14	18	7	2	14.58	96.3%	0.0%	33.3%	66.7%	>3 year (51.9%)	7.4%
Bone	**21**	14	7	12	5	4	14.08	61.9%	0.0%	19.0%	81.0%	2.5 – 3 year (28.6%)	19.0%
Lombok Tengah	**27**	12	15	10	16	1	13.62	88.9%	40.7%	51.9%	7.4%	1.5 – 2 year 2 – 2.5 year (25.9%)	3.7%
Sikka	**25**	9	16	10	10	5	13.52	92.0%	8.0%	16.0%	76.0%	6 mo – 1 year (24.0%)	28.0%
Belu	**25**	12	13	13	4	8	13.42	4.0%	4.0%	32.0%	64.0%	6 mo – 1 year (24.0%)	32.0%
Jayapura	**26**	13	13	17	3	6	13.76	61.5%	0.0%	42.3%	57.7%	>3 year (26.9%)	19.2%
Aceh Besar	**28**	10	18	11	9	8	13.17	53.6%	0.0%	64.3%	35.7%	6 mo – 1 year (28.6%)	32.1%
Total	**269**	**128**	**141**	**134**	**74**	**61**	**14.14**	**62.1%**	**5.6%**	**46.8%**	**47.6%**	**1.5-2 year (20.4%)**	**21.9%**

Appendix 8. Means differences by period of ECD and Non-ECD exposure

Table 10. Means differences by period of ECD and Non-ECD exposure

Subtests		Means Differences						
		<6mo	6mo-1yr	1-1.5yr	1.5-2yr	2-2.5yr	2.5-3yr	>3yr
Total (n)		**12**	**39**	**18**	**55**	**20**	**33**	**33**
Total Readiness	Mean Difference (with Non-ECD)	0.751	3.033	3.751	5.928*	5.540*	4.688*	4.894*
	Sig.	0.763	0.063	0.078	0.000*	0.007*	0.007*	0.005*
Non Scholastic	Mean Difference (with Non-ECD)	-0.121	1.430*	0.934	1.556*	1.367*	1.618*	0.521
	Sig.	0.885	0.009*	0.190	0.002*	0.047*	0.005*	0.365
Total Scholastic	Mean Difference (with Non-ECD)	0.873	1.604	2.817	4.373*	4.173*	3.100*	4.373*
	Sig.	0.668	0.228	0.105	0.000*	0.013*	0.027*	0.002*
Pre Reading	Mean Difference (with Non-ECD)	-0.525	0.423	0.808	1.020*	1.075*	1.050*	0.656
	Sig.	-.287	0.189	0.055	0.001*	0.008*	0.002*	0.053
Pre Writing	Mean Difference (with Non-ECD)	0.178	0.857	0.789	1.787*	0.978	1.193	1.557*
	Sig.	0.843	0.145	0.303	0.001*	0.184	0.054	0.012*
Pre Mathematics	Mean Difference (with Non-ECD)	0.465	-0.067	0.381	0.463*	0.431	0.275	0.336
	Sig.	0.171	0.760	0.186	0.021*	0.120	0.237	0.149
Language Proficiency	Mean Difference (with Non-ECD)	0.056	0.210	0.612*	0.427*	0.390	-0.095	0.450*
	Sig.	0.856	0.301	0.022	0.022*	0.127	0.657	0.036*
Problem Solving	Mean Difference (with Non-ECD)	0.699	0.180	0.227	0.840	1.299	0.676	1.373*
	Sig.	0.447	0.764	0.772	0.124	0.085	0.284	0.030*
Gross Motor Skills	Mean Difference (with Non-ECD)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Sig.	1.000	1.000	1.000	1.000	1.000	1.000	1.000

(*) significant $p < 0.05$

Appendix 9. Mean Differences in Sub-tests between Children who were Proficient (n=128) with those Do Not Understand (n=15) and those who Understand (n=126) in Bahasa Indonesia

Table 11. Mean Differences in Sub-tests between Children who were Proficient (n=128) with those Do Not Understand (n=15) and those who Understand (n=126) in Bahasa Indonesia

Subtests		**Means Difference**	
		Not Understand	**Understand**
Total (n)		**15**	**126**
Total Readiness	Means Difference (with proficient)	8.742	3.094
	Sig.	0.000 *	0.002 *
Total Non Scholastic	Means Difference (with proficient)	2.475	0.290
	Sig.	0.001 *	0.383
Total Scholastic	Means Difference (with proficient)	6.267	2.796
	Sig.	0.000 *	0.001 *
Pre Reading	Means Difference (with proficient)	1.352	0.344
	Sig.	0.002 *	0.084
Pre Writing	Means Difference (with proficient)	1.275	1.113
	Sig.	0.100	0.002 *
Pre Mathematics	Means Difference (with proficient)	0.668	0.443
	Sig.	0.021 *	0.001 *
Language Proficiency	Means Difference (with proficient)	1.545	0.317
	Sig.	0.000 *	0.008 *
Problem Solving	Means Difference (with proficient)	1.498	0.650
	Sig.	0.058	0.074
Gross Motor Skills	Means Difference (with proficient)	0.000	0.008
	Sig.	1.000	0.301

(*) significant < 0.05

Appendix 10. Characteristics of Family

Table 12. Characteristics of Family

Districts	n	∑ Siblings (including respondent)	∑ Years of Education		∑ Working Hours / Day		Bahasa Indonesia Proficiency			Time Spent with Children
			Father	Mother	Father	Mother	Not Understand	Understand	Proficient	
Pandeglang	**22**	2 people & 4 people (27.3%)	6 yr. (72.7%)	6 yr. (59.1%)	9 hours (29.4%)	5 hours (28.6%)	0.0%	63.6%	36.4%	1-2 hours & 2-3 hours (27.3%)
Sukabumi	**21**	2 people (47.6%)	6 yr. (45.0%)	6 yr. & 9 yr. (23.8%)	6 hours (41.7%)	3. 4 & 6 hours (28.6%)	0.0%	61.9%	38.1%	1-2 hours (42.9%)
Wonosobo	**25**	2 people (56.0%)	6 yr. (50.0%)	6 yr. (56.0%)	9 hours (37.5%)	5 & 16 hours (22.2%)	8.0%	16.0%	76.0%	1-2 hours (40.0%)
Banyumas	**22**	2 people (31.8%)	6 yr. (54.5%)	6 yr. (31.8%)	5 hours (19.0%)	9 hours (20.0%)	4.5%	63.6%	31.8%	5-8 hours (40.9%)
Probolinggo	**27**	2 people (55.6%)	12 yr. (48.1%)	12 yr. (29.6%)	9 hours (26.1%)	5 hours (30.0%)	0.0%	37.0%	63.0%	>8 hours (74.1%)
Bone	**21**	2 people & 3 people (28.6%)	6 yr. (28.6%)	6 yr. & 12 yr. (23.8%)	5 hours (50.0%)	6 hours (42.9%)	14.3%	85.7%	0.0%	<1 hours (76.2%)
Lombok Tengah	**27**	2 people (37.0%)	0 yr. (37.0%)	0 yr. (37.0%)	5 hours & 8 hours (19.0%)	1 hours (25.0%)	29.6%	40.7%	29.6%	<1 hours (40.7%)
Sikka	**25**	3 people (36.0%)	6 yr. (28.0%)	3 yr. (20.0%)	6 hours (27.3%)	3. 7 & 8 hours (20.0%)	8.3%	25.0%	66.7%	1-2 hours (44.0%)
Belu	**25**	2 people (44.0%)	6 yr. (44.0%)	6 yr. (60.9%)	6 hours (30.0%)	6 hours (33.3%)	8.0%	36.0%	56.0%	<1 hours & 1-2 hours (32.0%)
Jayapura	**26**	3 people (38.5%)	12 yr. (30.8%)	9 yr. (26.9%)	6 hours (21.7%)	5 & 6 hours (26.7%)	0.0%	42.3%	57.7%	1-2 hours (46.2%)
Aceh Besar	**28**	2 people (31.1%)	12 yr. (59.3%)	12 yr. (32.1%)	12 hours (20.0%)	5 hours (25.0%)	0.0%	64.3%	35.7%	>8 hours (39.3%)
Total	**269**	**2 people (36.8%)**	**6 yr. (34.2%)**	**6 yr. (30.0%)**	**6 hours (16.1%)**	**6 hours (17.7%)**	**6.7%**	**47.8%**	**45.5%**	**1-2 hours (26.0%)**