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Educational Research Association
The International Journal of
Educational Researchers 2018, 9(2): 24-36
ISSN: 1308-9501



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The Contribution of Pre-School Education to Students' Academic Achievement in first cycle Primary Schools of Ethiopia

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Abstract

This study was aimed at investigating the contribution of pre-school education in the first cycle primary school. This contribution was assessed in terms of students' academic achievement. Academic achievement was measured in terms of students' achievement result obtained from school records. The study used an ex-post facto design, in which what is happening on the students' achievement in primary school as their pre-school education was assessed. The participants of the study were selected randomly from Burayu Town administration government elementary schools. Students' result record/roster from grade one to four in three subjects (Afan Oromo, English and Mathematics) was analyzed to see the contribution of pre-school in the academic achievement during their primary school years and difference between pre-school attendees and non attendees. The study result showed that, pre-school education contributes to better students' academic achievement. In addition the analysis of the achievement result also reveals that there was statistically significant difference between pre-school attendees and non attendees across the primary school years with $p < .001$. The difference in achievement between these groups was higher in grade one and slightly decreased across grade years. It was recommended that the government together with private and NGO partners should design strategies that provide pre-school education to rural areas and expand access and better enrolment in pre-school education.

Keywords: Pre-school education, First cycle primary education, Academic achievement.

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INTRODUCTION

Background of the study

Education being an indispensable tool in nations building is a process of systematic training and instruction designed to transmit knowledge and acquisition of skill, potentials and abilities which will enable an individual to contribute efficiently to the growth and development of his society and nation. It involves all round development of an individual physically, socially, morally, intellectually, and mentally, (Osakwe, 2006).

The development of any country relies largely on the quality of human capital. Education plays a vital role in the development of human capital and is linked with individuals' well-being and opportunities for better living (Memon et al, 2010; Farooq et al., 2011 and Ababa et al., 2012). As a result, researchers have long been interested in examining variables contributing effectively to the quality of performance of learners (Farooq et al., 2011).

Formal education is given to children at various levels; the first level which is the base for other levels is pre-school education. Pre-school education encompasses the education system given for children with age group of three to six and is also called nursery school education and kindergarten education. It caters for children aged 4–6 years (Woodhead et al., 2009). Even though early childhood care and education has been identified as one of the priorities for the education sector due to its role for the overall improvement of quality of education and reduction of drop out as well as repetition rates in later stages of formal schooling (MoE, 2010).

Early childhood education experiences according to Barnard (2001) positively affect later home and school involvement in education. A child who fails to acquire early education may suffer emotionally, socially, intellectually and even physically if he is trusted into the primary school without a sustainable early childhood education experience that will give him a solid foundation in the primary school. Therefore for the effective and efficient unlocking and development of a child's latent abilities, attitudes and other forms of behavior of positive values in the society in which he lives, early childhood education becomes very imminent. This is of utmost importance because researches on early childhood education have shown that early childhood education experiences have great impact on all areas of a child's development and had suggested that the first teacher is an extremely important person in the child's life (Cunha et al, 2006; Currie 2001; Goodman and Sianesi, 2005).

Huge body of empirical works that demonstrate the effects of early childhood education on a child's cognitive; language and social development are found mainly in North America and Western Europe, particularly in the United States. Still, only little has been learned about the relationship between early childhood education and child outcomes in settings outside of the developed countries although comparable research is being done in a growing number of developing countries (UNESCO, 2010). According to **Iowa School Board Foundation (2007)**, Pre-school attendance is associated with short and long-term, positive effects on academic performance. The board noted that children who attended preschool tended to enter primary school with increased cognitive abilities, higher literacy abilities, and higher subject abilities. Children who had attended ECE maintained academic performance advantage over children who had not. It was also noted that children who had attended ECE Have higher literacy and subject achievement scores in primary school. They also had had better attitudes toward learning and school than peers who did not receive early childhood education prior to primary school entry (**Ramey et al., 2000**).

Most research findings have confirmed that children's earliest experiences in life can have a profound effect on their success in later grade levels and beyond. The earliest years of a child's life represent a crucial period of biological, psychological, social and emotional growth and change. The first five years of life represent a critical window of opportunity in the healthy development of young children; what children learn and feel during this time will be foundational to the rest of their life (Weiss and

Offenberg, 2002; Sacks and Ruzzi, 2005; Slaby et al., 2005; Robin et al., 2006; Woodhead et al., 2009; Berlinski, et al., 2009; Bibi and Ali, 2012; Young Lives, 2013; Yoshikawa et al., 2013). Attending pre-school education is the first step in child's educational journey and it is among the major factors determining later success of students in the academic arena (Taiwo and Tyolo, 2002; Weiss and Offenberg, 2002; Finn, et al., 2005; Bibi and Ali, 2012).

When come to Africa, related research activities are very scant. Very few studies have been conducted to assess the effects of preschool attendance on cognitive development of children. For instance, Peter Glick et al. (2007) estimate the determinants of cognitive ability among 14 to 17 year olds in Senegal. Unlike standard school-based samples, tests were administered to current students as well as to children no longer—or never—enrolled. Result of the study indicates that years of schooling strongly affects cognitive skills, but conditional on years of school, parental education and household wealth, as well as local public school quality, have surprisingly modest effects on test performance. Instead, family background primarily affects skills indirectly through its impacts on years of schooling. Therefore closing the schooling gaps between poor and wealthy children will also close most of the gap in cognitive skills between these groups.

Statement of the problem

Coming to the target country, Ethiopia, as far as our knowledge, very few studies have been conducted related to the early childhood education. Formally, compulsory education in Ethiopia starts at age seven in primary schools. Nevertheless, children can join pre-primary schools between age three to six depending on the availability of the program in their areas. As it is already explained in section one, early childhood education is structured in the form of kindergartens and predominantly provided by the private sector, Non-Governmental Organizations (NGO), communities and faith-based organizations. The government has very limited intervention on this regard. To be precise, in its 2007 report, the Ministry of Education (MOE) states that the government does not run preschool education program essentially for two main reasons. While one explanation, as stated in the document, is to enhance the involvement of the private sector in the education sector, the second justification is to maximize the government's effort in the other levels of the sector. As the result of this government's limited intervention, enrollment rate for preschool education has remained very low, especially in rural areas of the country. In addition, primary education is currently taken as a substitute for preschool education in most parts of the county. That is, majority students are enrolled to primary education without having any exposure to preschool program.

A study in Ethiopia (Young Lives, 2013) disclosed that attending pre-school education improves early enrolment in formal primary education and the grade completed; children who attended pre-school tend to have completed a higher grade than those who did not. A study by Woldehanna (2011) in Ethiopia underlined that early childhood education attendance is positively associated with a substantial improvement in children's cognitive development. Using an econometric model, he found that children who have been attending kindergarten have scored 24.4% higher in the raw score of the Peabody Picture Vocabulary Test and 19.6 % in cognitive development than those without pre-school experiences which was statistically significant. Though pre-school education has a profound significance, the service in Ethiopia was restricted in urban centers and for children from the better-off families. Moreover, little research has been done so far in Ethiopia. From the ongoing discussion, one can easily understand that more empirical based research has to be done to convince policy makers and practitioners to expand pre-school education to reach the unserved portion of the population.

Moreover, the context of this study is the debate about the effects of Early Childhood Education on children's academic learning outcomes. Numerous studies on the impact of ECE on children's performance have led to two main conclusions; that ECE has long lasting effects on children's performance (Schweinhart, 1993) and that they are strongest when the quality of early education is high (NICHD, 2002; Love, 2003). However, there is still debate about how long the effects last and whether they last longer, or are more powerful, for the poorest groups. This study contributes to that debate.

Therefore, this research is designed to investigate the contribution of pre-school education to students' academic achievement on the first cycle primary schools at Burayu Town administration. To achieve this objective the following research questions were forwarded.

1. What are the contributions of pre-school education on students' academic achievement in Burayu Town administration primary schools?
2. Is there a significant difference between pre-school and non pre-school first cycle primary school students' academic achievement in Burayu Town administration primary schools?

Objectives of the Study

The general objective of this study was to investigate the contribution of pre-school education on academic achievement of students in primary schools. More specifically the specific objectives of this research were:

- To assess the contribution of pre-school education to first cycle primary school students' academic achievement.
- To compare the difference in the academic achievement of primary school students with pre-schooling and without pre-schooling.

The results of this research may help the policy makers, Non-Governmental organizations and education officers to mobilize the society and search for preferable directions in promoting access and enrollment. The existing primary schools may use the evidence from this research to communicate with parent and other stakeholders to make their school more suitable for their own "O" class as attached pre-primary school. It may encourage teachers in supporting the existing attached pre-school in their primary school as the result of the difference between pre-school attendees and non pre-school attendees in their classroom as well to make them plan for attention, support and make up the learning of those non pre-school attendees to take them along with the pre-school attendees in their own classroom. Moreover, it may lead teachers to communicate with parents to make them identify the area of support for their children. Therefore, it is important to show what influence does pre-school education has on children's school performance for all concerned bodies.

Research Method

Research Design

In studying the contribution of pre-school education to the first cycle primary school students' academic achievement, exactly there are participants with pre-school experience and non pre-school experience. But these two groups are not randomly formed by the researcher and they are happened as a result of pre-school experience happened in the past without manipulating conditions for formation of the groups. As a result the research design used was ex-post facto design. According to Kothari (2004), the ex-post facto design for descriptive research is the method in which the researcher has no control over the variables; the researcher can only reports what has happened or what is happening. Also Cohen, Manion and Morison (2007) stated that ex-post facto means from what is done afterwards and ex-post facto research is that in which independent variable have already occurred where the researcher starts with the observation of the dependant variable/variables.

Samples and sampling techniques

This study was conducted in Burayu town administration in Oromiya regional state which is equivalent to zonal administration. In this town administration there are seven government primary schools which have attached pre-primary classes and have students who attended pre-school education in private and faith based pre-schools. Among these primary schools four schools namely Burayu Mariyam, Kata, Gafarsa Chorisa and Guje primary schools were randomly selected to see the contribution of pre-school education on grade four students' academic achievement.

The sources of data for this research are first cycle primary school students, teachers and school principals, since they are the front liners to deal with primary school students whether the students were pre-school attendees or not. Hence, two senior teachers in each samples first cycle primary schools were taken as participants of the research purposefully. Principals and vice principals were totally eight in the sampled schools, thus 7 of them were selected as sample by using availability sampling technique. Hence, the total sample was summarized in table as follows.

Table 1: Summary of the samples taken

No.	Participants	Population	Sample	Sampling technique	
1	Students	782	264	With pre-school 132 Without pre- school 132	Simple random sampling
				8	Simple random sampling
2	Teachers	65		Purposive sampling	
3	Principals	8	7	Availability sampling	
	Total	855	279		

As indicated in Table 1, in general 264 students, 8 teachers and 7 principals and vice principals (totally 279 participants) were selected as sample of the study.

Instruments of data collection

Document analysis

The document analysis deals with the students' academic achievement result. The result included students' achievement result of grade one up to four in the three subjects Afan oromo, English and Mathematics. The results were students' grade one result in the indicated subjects in the academic year 2012/13, grade two achievement results in the academic year 2013/14, grade three achievement result in the academic year 2014/15 and grade four students' achievement results in the academic year 2015/16.

Interview

Semi structured interview guide questions were prepared for school principals and senior teachers. The reason for using this interview is for triangulation of the information from other participants about the contribution of pre- school education in primary schools.

Procedures of Data Collection

In document analysis students' academic achievement result was taken from the school record office. In other words, students' achievement result record /roster from the academic year 2012/13 to 2015/16 were taken to analyze students' achievement difference.

Finally, interview with school principals and senior teachers of sample schools took place by communicating with each of them by making agreement and arranging on appropriate time in their context.

Validity and Reliability of the Instruments

The researchers prepared semi-structured interview guide questions based on the review of related literature. In case of the students' achievement result, the result was obtained from the teacher made continuous assessment from grade one to four. It was clear that the result was dependent up on the curriculum and syllabus of the appropriate grade levels and teachers used different assessment techniques to assess their students.

Methods of Data analysis

The students' achievement score was analyzed in terms of mean and standard deviation, bar graph and t-test was also employed to describe and check whether the achievement difference between the student with pre-school experience and those without pre-school was significant or not. Finally, data

from interview results were analyzed with narration using the themes obtained through the interview to support the quantitative findings.

Ethical Considerations

The purpose of the study was explained to the participants and they have asked their consent to answer questions in the interview guide. The participants were also informed that the information they have provided will not be given to a third party. Accordingly, the information that the participants provided was used only for the study purpose. In addition, the researchers ensured confidentiality by making the participants anonymous.

Result

After the data were collected by using different instruments and from the different sources, the data were analyzed based on two thematic issues: academic achievement of pre-school and non-preschool attendees and the difference on achievement between these groups.

3.1. Academic Achievement of Primary School Students with Pre-Schooling, “O” class and without Pre-Schooling

To see the difference of academic achievement between the groups, currently grade four students were selected. Then their grade one achievement in the academic year 2012/13, their grade two achievement in the academic year 2013/14, their grade three academic achievement in 2013/14 and their grade four achievement in 2015/16 in three subjects Afan Oromo, English and Mathematics was taken and analyzed.

When this achievement record was analyzed, first it was categorized in to three as pre-school KG, pre-school "O" class and non pre-schools and presented with help of table and bar graph. Second regrouping was done in to two where pre-school KG and pre-school "O" class were taken as one group and that of non-pre-school was taken as another in which the variation of the difference in achievement along grade one to four was shown using table and line graph again. These results were identified by subject, grade and pre-school experience and summarized with the mean score of their achievement.

First let us see the difference of students achievement between the three groups pre-school KG, pre-school "O" class and non pre-schools. In the table below the mean scores of these groups of students in three subjects across grade one to four are presented.

Table 2: students' academic achievement result for three subject in four grades

Pre-school experience	Grade Level											
	Grade 1			Grade 2			Grade 3			Grade 4		
	A/Oromo	English	Maths	A/Oromo	English	Maths	A/Oromo	English	Maths	A/Oromo	English	Maths
Pre-school KG	85	81	83	82	80	79	78	76	76	77	74	75
Pre-school O class	81	77	78	79	78	77	76	75	73	75	69	68
No pre-school	66	62	63	65	63	64	63	60	60	64	57	60

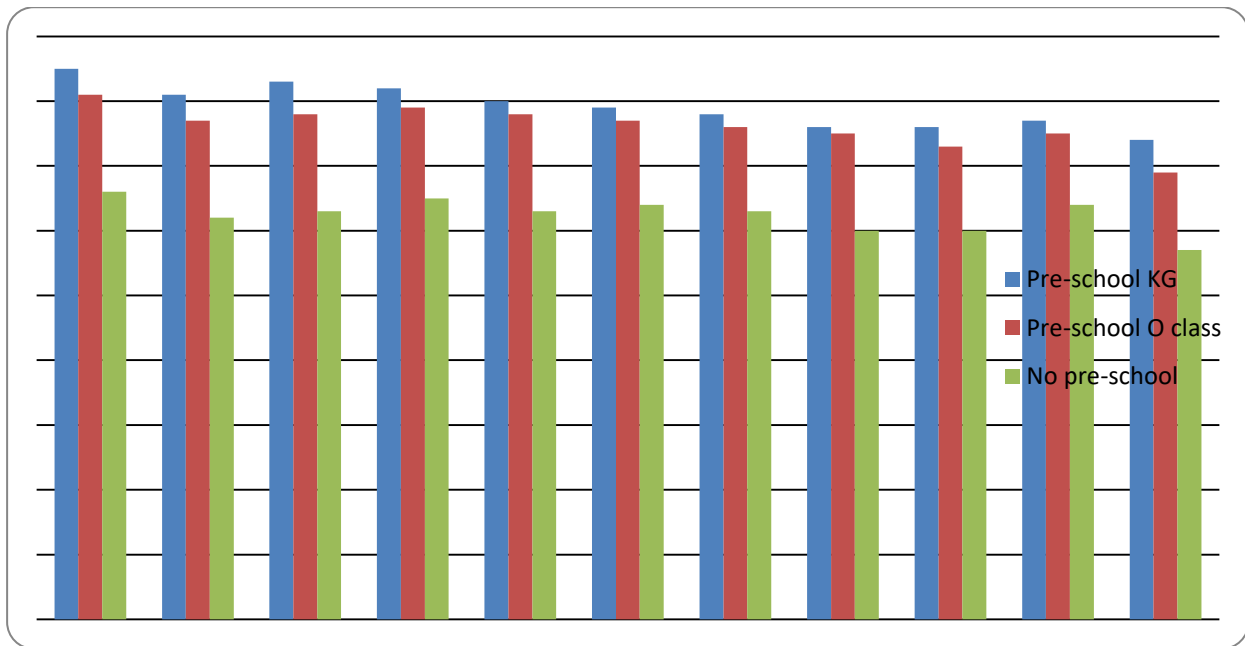


Figure 1: Academic achievement of primary school students with pre-school and without pre-school

As indicated in Table 2 and Figure 1 above there is an academic achievement difference in Afan Oromo along grade one to four. Thus, pre-school KG attendees achieved more than both "O" class and non pre-schools; whereas pre-school "O" class attendees in turn achieved more than non pre-schools.

Regarding English achievement the above Table 2 and Figure 1 above there is also an academic achievement difference in English along grade one to four, where pre-school KG attendees achieved more than both "O" class and non pre-schools. Also pre-school "O" class attendees in turn achieve more than non pre-schools.

Furthermore, Table 2 and Figure 1 above indicates that there is an academic achievement difference in Mathematics along grade one to four, where pre-school KG attendees achieved more than both "O" class and non pre-schools. Also pre-school "O" class attendees in turn achieved more than non pre-schools.

2.2. The difference in academic achievement when compared as two groups

Under this re-grouping was done. Then Pre-school KG and "O" class are taken as one group and non-pre-schools are considered as other group. Hence the difference in achievement between the two groups is compared and how the difference between them continues along grade one to four was seen.

Table 3: the difference in academic achievement when compared as two groups

Pre-school experience	Grade Level											
	Grade 1			Grade 2			Grade 3			Grade 4		
	A/Oromo	English	Maths	A/Oromo	English	Maths	A/Oromo	English	Maths	A/Oromo	English	Maths
Pre-school KG	83.6	79.7	81.3	81.3	78.8	77.9	77.2	75.3	75.5	76.3	72.5	72.7
No pre-school	65.8	61.5	63.3	78.8	63.3	63.5	62.7	57.9	60.3	63.5	56.9	59.7
Difference	17.8	18.2	18	16.1	15.5	14.4	14.5	17.4	15.2	12.8	15.6	13

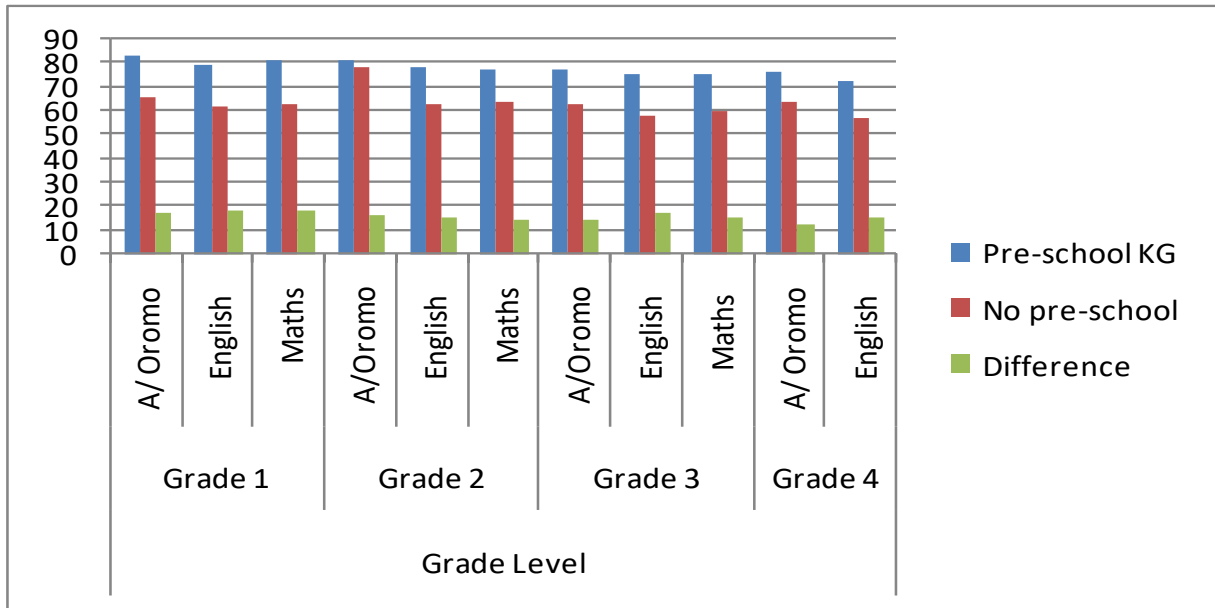


Figure 2: The difference in academic achievement when compared as two groups

From Table 3 and Figure 2 it was possible to understand that there is a difference in academic achievement in Afan Oromo across grade one to four, indicating that pre-school attendees achieved more than non pre-school attendees in first cycle primary schools.

As it is seen from Table 3, Figure 2 the difference between the two groups (Pre-school attendees and non pre-school attendees) in achievement in Afan Oromo varies across grade one to four. That is highest in grade one and the variation decreased along the grades in the subject.

As it can be observed from Table 3, and Figure 2, there is academic achievement difference in Afan Oromo, where pre-school attendees achieved more than non pre-school attendees along grade one to four through the academic year 2012/13 to 2015/16.

Likewise, from the same Table and Figure the difference between pre-school attendees and non pre-school attendees in English achievement varies. This difference is highest in grade one, decreased in grade two, then higher in grade three than grade two and again decreased in grade four. But the existence of difference remained across grade one to four.

In addition, when one observes from Table 3 and Figure 2, exactly there was a difference in achievement between the two groups in mathematics from grade one to four.

Moreover, it is possible to clearly observe from Table 3, Figure 2, there was a difference in mean scores of the achievement in Mathematics from grade 1 to 4. The difference observed was varying along the grades, where it was maximum in grade one and slightly decreases along the grades except it showed little increase at grade three. Even though the achievement difference between the groups along the grades 1 to 4 decreases, it exists in all the grades.

In addition to show the difference in achievement between the groups with descriptive statistics, the independent sample t-test was used to confirm whether there is statistically significant difference in achievement between the groups in the indicated subjects across grade one to four. Then Table 4, shows the result of the independent sample t-test.

Table 4: The summary of independent sample t-test in comparing achievement

Pre-school experience		N	M	SD	MD	t	df	P	Cohen's d^t
Afan Oromo grade one	with pre-school experience	132	83.6	10.9					
	No pre-school experience	132	65.8	13.6	17.7	11.64	250.28	.000	1.43
English grade one	with pre-school experience	132	79.7	11.9	18.2	11.65	262	.000	1.43
	No pre-school experience	132	61.5	13.4					
Mathematics grade one	with pre-school experience	132	81.2	11.4	17.9	11.47	253.69	.000	1.42
	No pre-school experience	132	63.3	13.8					
Afan Oromo grade two	with pre-school experience	132	81.3	10.9	16.1	10.56	249.39	.000	1.31
	No pre-school experience	132	65.1	13.7					
English grade two	with pre-school experience	132	78.7	12.1	15.4	9.70	262	.000	1.20
	No pre-school experience	132	63.2	13.7					
Mathematics grade two	with pre-school experience	132	77.7	13.7	14.2	8.54	262	.000	1.05
	No pre-school experience	132	63.5	13.3					
Afan Oromo grade three	with pre-school experience	132	77.2	13.2	14.5	8.60	262	.000	1.06
	No pre-school experience	132	62.7	14.1					
English grade three	with pre-school experience	132	75.2	11.1	17.3	12.97	262	.000	1.60
	No pre-school experience	132	57.9	10.5					
Mathematics grade three	with pre-school experience	132	75.4	10.7	15.2	10.82	262	.000	1.34
	No pre-school experience	132	60.2	12.					
Afan Oromo grade four	with pre-school experience	132	76.2	13.3	12.7	7.55	262	.000	0.93
	No pre-school experience	132	63.5	14.0					
English grade four	with pre-school experience	132	72.4	13.1	15.5	8.49	249.77	.000	1.05
	No pre-school experience	132	56.9	16.4					
Mathematics grade four	with pre-school experience	132	72.6	14.0	12.9	7.71	262	.000	0.95
	No pre-school experience	132	59.7	13.2					

Note: *Value for equal variances not assumed is taken (based on Levene's Test for Equality of Variances). Cohen $d = [(Mean1 - Mean2)/pooled\ standard\ deviation]$ where pooled standard deviation is the average of the standard deviations of the two groups. 0-0.2 (weak effect); 0.21-0.5(modest effect); 0.51-1(moderate effect) and greater than 1.0(strong effect) as stated in Muijs cited in (Eshetu, 2015).

Note: N= number of members in a group, M = Mean, SD = standard deviation, MD = Mean difference, t = t-test value, df = degree of freedom and p = sig (two tailed).

As Table 4 depicts, the difference in achievement between the groups in the indicated subjects along the grades one to four is statistically significant where all p values were less than the cut point such that $p < .001$, and $df = 262$. This confirms that the difference in achievement in first cycle primary school is statistically significant between students of pre-school attendees and non pre-school attendees. The effect size of the significance difference for all the subjects in all the grades has strong effect. In general the differences are high indicating wider margins between the groups. The t-values are all positive implying that the students with pre-school experience scored higher than their non pre-school counter parts.

All the interview respondents agree up on the view that, there was a difference in academic achievement between pre-school attendees and non-attendees. They all confirm that when students with pre-school experience came to grade one, they were familiar without of home environment, were more friendly with their teachers than non-attendees, they have differentiated basic symbols to write letters and numbers, even those attendees who have completed up to KG-3 were able to read and write well than non pre-school attendees. These all contribute to make those attendees achieve more. Especially the vice principal of Burayu Elementary School stated that "Pre-school attendees were free

from fear and were more friendly with their teachers and their classmates. They have developed the skill of writing and reading. These all will enable them to achieve better than others."

Finally to see the effect of some controlling variables such as age, sex and family occupation background of students' linear regression was computed. Then the result of regression made was described in the following table.

Table 5: Summary of the three regression models of control variables and pre-school experience on students' achievements in (n = 264)

No	Predictors	Dependent Variable											
		Achievement in Afan Oromo				Achievement in English				Achievement in Maths			
		B	SE	T	β	B	SE	t	β	B	SE	t	β
1	sex of a student	1.89	1.38	1.4	.02	1.8	1.3	1.4	.03	.35	1.3	.27	.01
2	age of a student	.328	.86	.38	.02	.52	.81	.62	-.07	.78	.82	.95	.05
3	Families occupation back ground	-.29	.131	-1.8	-.09	-.17	.12	-1.4	-.07	-.17	.13	-1.4	-.07
4	Pre-school experience	-7.8	.68	-11.4	-.59***	-8.5	.64	-13.2	-.64***	-7.7	.65	-11.8	-.60***
5	F for change in R ²				.342			.407				.351	
6	Adjusted R ²			.332				.398				.341	

Note: Significance level ***p<.001

Table 5, shows that the control variables sex, age and families occupation background were not significant predictors of achievement in the primary schools of the study site, as the p-values for the three variables was $p > .05$ and only pre-school experience was the strongest predictor of students achievement in Afan Oromo, English and Mathematics with significance level $p < .001$.

Discussion

From the analysis of students achievement record the answer for research questions were treated. At the beginning the participant students were sub divided as pre-school KG, "O" class, and non pre-school attendees and their achievement in three subjects Afan Oromo, English and Mathematics was seen consequently. Then as shown in Table 2 and figure 1 there was academic achievement difference between the three groups in the mean score of the three subjects Afan Oromo, English and Mathematics across grade one to four. Therefore, there was an academic achievement difference between the groups where, Pre-school KG achieved the highest and pre-school "O" class achieved better than non pre-schools.

This finding is consistent with the findings of scholars (Barnet, 2008; Berlinski, et al 2009; Wana, 2010 and Eshetu, 2015) who found that students who attend pre-school education have higher test scores. Also Bibi and Ali (2012) conducted a research in Pakistan and found that 71% of student with pre-school education are high achievers while it was only 29% for students with no pre-school experience. Similarly Eweniyi, (2012) and Osakwe (2009) revealed that there was a significant difference between pupils who had pre-school education and those without in their academic performances. Moreover, this finding is in line with the study in Botswana by Taiwo and Tyolo (2002) who found that pupils with pre-school education experience significantly out-performed than their counterparts without pre-school experience in English language, Mathematics and Science subjects.

When the difference in achievement between the groups as pre-school attendees and non pre-school attendees are observed from Table 3, how the difference continues along grade on to four was analyzed. Though the two groups' achievement was decreasing from grade one to four, the difference in achievement between the two groups continues and as shown in Table 4, with the indicated subjects in all the identified grades there was statistically significant mean difference between the two groups with $P < .001$. In Afan Oromo this difference between pre-school attendees and non pre-school attendees slightly decreases across grade one to four as shown in Table 3, figure 2. Similarly the

achievement difference in English from grade one to four varies, but the variation was not in straight down ward. It was highest in grade one, decreased in grade two, then increased in grade three, but still less than the difference in grade one and finally decreased in grade four. Even though this difference fluctuates, it exists in all the grades. Finally the variation in achievement difference with Mathematics also exists where it was highest in grade one and slightly decreases along the grades except it was with little increase in grade three.

Conclusions

From the results of the findings stated above, depending on the research questions raised the following conclusion can be drawn.

Regarding the achievement result, pre-school attendees' achievement was higher. Pre-school "O" class attendees achieved more than non pre-schools and less than pre-school KG attendees. Thus, both pre-school attendees achieved more than non pre-school attendees. Even though this achievement exists across grade 1 to 4 it varies along the grades for the subjects. The difference was highest in grade 1 and relatively lower in grade 4. Furthermore, this difference in achievement is statistically significant with $p < .001$ from grade one to four assuring that there is statistically significant difference in achievement between pre-school attendees and non pre-school attendees. Also the effect of this significance difference was high for the subjects indicating that pre-school education has high effect on students' academic achievement in primary school. Hence, pre-school education contributes for better achievement in Afan Oromo, English and Mathematics.

Recommendations

Based on the indicated findings and conclusions made, and considering the contribution of pre-school education in academic achievement, the following recommendations can be forwarded.

Even though there was low cost pre-school education program currently started, most of the kindergarten program was situated in urban settings and for the advantaged groups only. Therefore, the government should design strategies that provide pre-school education for rural areas and the disadvantaged to allow children from low and middle classes to have the access of pre-school. Politicians, Educational offices, and all other stakeholders from top to bottom should arrange public conferences that enable to inform the contribution of pre-school education, so as to make the society and other stakeholders aware and invest on pre-school education, and support the existing pre-school education programs.

When students with pre-school experience and without pre-school experience are enrolled in grade one together, it is better if elementary schools arrange program/session in the form of tutorial program that can help those non pre-school attendees in their learning to go with pre-school attendees in classroom.

Extensive research with large representative sample has to be made to reason out why the academic achievement of students were decreasing in study site and to have over all evidence in the contribution of pre-school education as a country.

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