

Effects of Early Childhood Education on Students' Academic Achievement in Science at Elementary School Level

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Abstract

This study aimed to find the effects of Early Childhood Education (ECE) on students' academic achievement in science at elementary school level in district Haripur. The study's objectives were: 1) to investigate the impacts of ECE on students' academic achievements, 2) to compare the academic achievement of students who have attended ECE with those who have not attended ECE over the categories of male and female schools. All students at the elementary school level were considered as the population of the study. The study was delimited to grade 7th of the elementary school level. Ten (10) schools (five male and female schools each) were randomly selected as sample of the study. Four hundred (400) students (200 for ECE and Non ECE each) were randomly selected. Data were collected through academic achievement test having reliability coefficient 0.87. Data were analyzed by using SPSS software. ECE (Male) group was found superior to Non ECE (male and female groups); ECE (Female) group was found better than Non ECE (male and female groups). However, both the male and female of Non ECE groups were equal; and both the male and female of ECE groups were equal in their science academic achievement. Government may encourage ECE by providing pre-primary educational facilities (classrooms, instructional materials, and equipment) and by organizing in-service teachers' trainings to enhance teaching skills and to make it more successful.

Keywords: effects, early childhood education, academic-achievement, elementary school level, science.

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Introduction

Education is an important instrument for building the nations. According to Osakwe (2006), education is a procedure of organized instruction and training planned to transfer information and acquirement of capabilities, skills, and potentials to the learners, to participate competently in the progress of nation. It encompasses the all-round improvement of individuals.

Plato was the first philosopher to see the importance of what today is known as early childhood education and analyzed it in stages. He recommended nursery schools for children in between the ages of 3-6 years as the first stage. Nursery education supports the children and let them appreciate the world through intelligence and improve muscles through sports. He suggested the play-way method of teaching as good for the children at this stage. According to Aristotle, at the stage of ECE, the child's mind is quite impressionable at birth and the effect of instruction can reveal the best in the child. Comenius defined education as that powerful tool for achieving one's potentials that requires to be tapped early enough. According to Pestalozzi's philosophy about ECE, the child should be given enough time, chances and opportunities in order to unfold his hidden capabilities and talent. The teacher's role is just to provide help, lead towards child's growth, mental development, and guidance. Montessori's philosophy of childcare and education center on special care in the development of the child's senses along with muscles. To achieve this aim, the child should be given liberty in a "functional" educational setting. The philosophers; Dewey, Pestalozzi, Frobel and Piaget have mainly fixed their philosophies and practices of early childhood learning on functional teaching and learning. The Psychologists like Sigmund Freud and Erik Ericson were of the views that early childhood experiences have great effects on the future life of the individuals. The contents and information that the children come across in their early life becomes spotlight for their later life and education. There is a holy injunction that says, "train up a child in the way he should go and when he is old, he will not depart from it." It is concluded that whatever the child acquires in his pre-schooling times go a long way to assist him in his educational career and future life. So, this research aims to examine the impacts of pre-schooling on the child future education.

The children education has been assigned diversity of names like pre-school education, preprimary education, pre-Kindergarten, nursery or Montessori school education by various Educators, Psychologists, and Policy makers (Singh, 2007) and has also been included in different phases of education in Pakistan (Deeba & Anjum, 2012). Education in Pakistan

is separated into different stages comprising primary levels (1-5); elementary levels (6-8); secondary levels (9-10); higher secondary levels (11-12); graduate levels (13-14); postgraduate levels (15-16) (Deeba & Anjum, 2012). Education provided to the children of around three to five years is titled as preschool education or early childhood education. According to National ECE curriculum 2002-2007 of Pakistan, the suitable early childhood education programs not only help in brain development but also contribute to the physical, emotional, moral, and social development of child (MoE, 2002). This education is planned to explore the mental, physical, emotional, linguistic, and social development of the children (Bibi & Ali, 2012) by stimulating positive child outcomes. The general aim of ECE national curriculum, 2007 is to offer the holistic development of the child (Syed, Asif & Yousaf, 2011).

Neurobiology and other brain-based research in recent decades have found that most of the child's brain construction is fixed during the first five years of the early childhood life (UNICEF, 2001; Sacks & Ruzzi, 2005; Tassew, 2011; Yoshikawa et al., 2013) and because of these features, ECE is now focused globally (Woodhead et al., 2009). The initial five years periods are of outmost important. This period is a foundation for the rest of the life the child. The child develops good association and relationship with individuals around him (Hightower, 1999).

Preschool education is the initial stage in the educational voyage of the child, which is also referred to any organized program in which young children contribute before they do enter in primary schools that is planned to promote children's social, emotional, academic, linguistic, and literacy skills, and health and above all well-being (Justice & Vukelich, 2008). In Pakistan, preschool education is considered to be the pre-primary reception or the Kachi class; however, some projects efforts with range of zero to three years and therefore broaden the concepts of early childhood education (Ghulam, 1990). The classes of Kachi or Paki were integrated into the government schools through the seventh (7th) five years plan called Awal-adna, and Awal-aala. A child starts ECE at the age of three but pre-school kindergarten, nursery, Montessori and primary education having range from 2-8 years (Gardon & Browne, 2000) and a suitable program that helps the child from birth to the age of eight in order to work with young children successfully (Essa, 2005).

Pre-school education or ECE is a burning topic amongst the families and educationist today being strongly involved in the process (Masclé, 2016) for mainly three important reasons: 1) the ECE is the basis of the child's education because the knowledge and skills developed during the preschool years, will have a dramatic impact on the child's future

achievement; 2) during ECE, the child gets confidence by making learning as fun and easy which will help make the child an enthusiastic lifelong learner; and 3) the ECE provides the child a competitive and conducive educational environment i.e. the ECE children are ahead of the children who do not have the ECE background (Mascle, 2016). ECE offers a complete education, beginning from what the child knows and structure their confidence, sureness, while learning is taking place through experience as well as participation with peers (Khan, 2004). Omozeghian (1995) defined ECE as “the schooling for kids between the ages of 3-6 years. ECE can be defined as a formal scholastic procedure in which the kids from the ages of 2-1/2 to 5 plus are subjected to the designated preschool institutions (Mezieobi, 2006).

ECE is a branch of instruction theory that correlates to the education of kids (formally and informally) till the age of about eight. Infant/toddler education, a division of ECE, indicates the schooling of kids from birth to age two (Lewis, n, d).

Most research outcomes on ECE have established various outstanding successes and have a great impact on students' achievement in future grade levels and beyond. Mezieobi (2006) advocates that ECE plays an important part in the all-round improvement starting from the early years, successively passing on to the consecutive stages of life. Preschool education has important effects on later life of the child; it can change the social background of school entrance and thus, influence the academic achievement (Entwisle, 1995; Entwisle & Alexander, 1989; Benitez & Flores, 2002; Eshetu, 2015). Research studies have found that attendees of high quality ECE program enhance test scores (Wana, 2010). Further, the scientific studies have shown that the child early years interventions produce surprising opportunity to overcome learning problems and to bring lifelong benefits to individuals as well as rest of the society (MoE, 2002).

The initial years of the child can be optimally utilized for the achievement in future years (Weiss & Offenber, 2002; Taiwo & Tyolo, 2002; Slimmer, 2003; Finn et al., 2005; Barnett, 2008; Bibi & Ali, 2012) and those early years of a child's life denote an important phase of biological, social, psychological, and emotional development plus growth. According to the researchers including Weiss and Offenber (2002), Sacks and Ruzzi (2005), Slaby, Loucks and Stelwagon (2005), Robin, Frede and Barnett (2006), Woodhead et al (2009), Berlinski, Galiani and Gertler (2009), Bibi and Ali (2012), Young (2013), and Yoshikawa et al (2013), the initial five (5) years of life denotes a significant phase of chance in the

healthy development of young kids which remains for the rest of future life.

The effective ECE programs according to Hauser-Cram (2014) is thought to impact future academic skills, knowledge and motivation to learn at school entry (Ramey & Ramey, 1998), by providing further opportunities to improve academic engagement. ECE offers a suitable foundation for learning and supports to improve skills, knowledge, personal capability, confidence and wisdom of social responsibility. Marcon (2002) argues that there is a connection in between pre-school learning experiences and later school achievement. It is an asset of great importance in the later academic career and can positively affect later home and school participation in the education (Feeney, Christensen & Moravick, 1987; Barnard, 2001).

This study aimed to examine the effects of early childhood education on students' academic achievement in science at elementary school level in district Haripur.

The study objectives were:

- 1) To investigate the impacts of ECE on students' academic achievements,
- 2) To compare the academic achievement of students who have attended ECE with those who have not attended ECE over the categories of male and female school at elementary level.

The following null hypotheses were framed for this study:

H₀₁: There is no significant difference between the academic achievement of students in science with ECE and non ECE background.

H₀₂: There is no significant difference between the academic achievement of male and female students in science with ECE and non ECE background.

Many research studies have been carried out to see the effects of ECE programs over the past three decades. After studying the outcomes of thirty six (36) research studies, Barnett (1995) concluded that pre-school programs may create substantial longstanding impacts on school success, social-adjustment, placement in special education, and grade-retention. The research conducted by Taiwo and Tyolo (2002) in Botswana concluded that preschoolers performed better than non-preschoolers in the subjects of Mathematics, Science and English language. A study was carried out by Slaby, Loucks and Stelwagon, (2005) in California on ECE. It was found that preschoolers have a big chance of academic success in their future education. Magnuson et al (2007) in a longitudinal research study revealed that students with preschool background have higher levels of academic abilities in comparison to their counterpart who have no such

background. A research was conducted in Georgia by Fitzpatrick (2008) on ECE. An increase of 8.2 % was observed in favor of preschoolers in the subject of Mathematics. Osakwe (2009) found a meaningful difference among students who had ECE and those without ECE in their scholastic performances, intellectual capacity, psychomotor abilities and social-skills in favor of the former. Berlinski, et al. (2009) conducted a study on pre-school education in Argentina. It was found that one year of pre-school experience increases an average 3rd grade test scores by eight percent (8%). Further, pre-school appearance positively influences learners' attention, effort, self-control, students' involvement and control. A study conducted by Bibi & Ali (2012) to see the effect of early childhood schooling over the academic achievements of students at primary school level in district Peshawar. By considering the average scores of students at grade 5 levels, seventy one percent (71%) students with preschool education background were high achievers in comparison to twenty nine percent (29%) children with no ECE experience. This means that preschoolers are better in learning and take a dynamic role in the curricular and co-curricular activities. Eweniyi (2012) study in Nigeria on pre-school education has found that learners with formal kindergarten schooling improved than those without such facilities. The study of Rashid et al (2013) on the title "pre-school attendees and non-preschool attendees' academic achievement and social skills" found that pre-school attendees displayed superior outcomes in Mathematics English, and Science in comparison to non-preschool attendees (1155). The purpose of the study of Auger et al (2014) was to study the utilization of the instrumental variables approach to evaluate the impacts of preschool center care quality on the academic achievement of children. A significant effect was observed in the academic achievement of the children in favor of the preschool care center. The research study carried out Savaş & Gürel (2014) in Turkey revealed that ECE has a substantial effect on the academic achievement of students at junior secondary school level. Further, Eshetu (2015) carried out a study to investigate the relationship between appearing pre-school education and academic achievement of grade-8 learners. The academic achievement of the learners with and without pre-school background was equated. Students with pre-school background were found better than the students without pre-school education experience.

Methodology

This research study aimed to study the effects of pre-school (ECE) program in science at elementary level in district Haripur. It was a

multistage research design. Firstly, an observation sheet was used to collect data about the ECE and non ECE background students from the heads of the institutions. Secondly a causal comparative research study was conducted.

Pupils at the elementary school level of district Haripur were considered as the population of this research.

Four hundred (400) students (200 each for ECE and Non ECE: 200 each for male and female) from Ten (10) elementary schools (five each male and female schools) were randomly selected as sample of the study. The students were further divided into 100 each to ECE (male), ECE (female), non ECE (male), and non ECE (female) respectively.

Data were collected through an academic achievement test in the science subject consisted of Physics, Chemistry and Biology related portions. The achievement test consisted of 70 multiple choices questions/items and there were four options for each item. The test was made reliable and valid by Pilot testing 40 students other than the sample and expert opinion. The reliability coefficient of the test was calculated $\alpha = 0.87$.

The researcher collected the data by himself from grade 7th students of the ten sampled schools through administering the academic achievement test. The collected data were analyzed by utilizing mean, standard deviation, t-test, and analysis of variance (ANOVA) via using statistical package for social sciences. The data obtained was interpreted and clarified in the light of the objectives and hypotheses of the study given below:

Results

Table 1

Mean, SD, and SE on the academic achievement scores for the ECE and Non ECE background students in the subject of science at elementary level

Factors	N	Mean	SD	Std. Error of Mean
ECE	200	44.23	14.84	1.049
Non ECE	200	34.73	7.75	0.548
Total	400	39.48	12.74	0.637

Table 1 showed the mean scores and standard deviations of the ECE and non ECE background students. The value of mean scores calculated for ECE, Non ECE and total students were (44.23), (34.73), and (39.48) respectively, which shows that ECE background students are ahead in academic achievement than Non ECE background students.

Table 2

Comparison of ECE and non ECE students on the academic achievement in the different portions of science subject

Parts	Groups	N	Mean	SD	S.E.M	t	Sig (2-tailed)
Biology Part	ECE	200	14.10	5.47	0.39	5.59	0.000
	Non ECE	200	11.49	3.66	0.26		
Chemistry Part	ECE	200	14.26	5.36	0.38	6.99	0.000
	Non ECE	200	11.25	2.89	0.20		
Physics Part	ECE	200	15.88	5.88	0.42	7.32	0.000
	Non ECE	200	11.99	4.66	0.33		
Overall Science	ECE	200	44.23	14.84	1.05	8.02	0.000
	Non ECE	200	34.73	7.76	0.55		

Table 2 indicated $p < 0.05$ level of significance for all parts of science. So, the calculated values of t (5.598), (6.994), (7.320), (8.022) are significant for each part of the science subject. The mean scores of ECE students (14.10), (14.26), (15.88), (44.23) are greater than the corresponding means scores of the non ECE students (11.49), (11.25), (11.99), (34.73) for each part of the science subject. This means that ECE students are higher in academic achievement in biology, chemistry, physics. Thus hypothesis that 'there is no significant difference between the academic achievement of students in science with ECE and non ECE background at elementary level', is completely rejected. So, pre-school program has greater impact on academic achievement at elementary level science.

Table 3
ANOVA for the gender base comparison of ECE and non ECE students on the academic achievement in the different portions of the science subject

Parts	Groups	Sum of Squares	df	Mean Square	F	Sig.
Biology	Between Groups	768	3	255.93	11.88	0.000
	Within Groups	8528	396	21.54		
	Total	9296	399			
Chemistry	Between Groups	1116	3	372.02	20.57	0.000
	Within Groups	7161	396	18.08		
	Total	8277	399			
Physics	Between Groups	1693	3	564.31	20.26	0.000
	Within Groups	11028	396	27.84		
	Total	12721	399			
Overall Science	Between Groups	9403	3	3134.35	22.38	0.000
	Within Groups	55445	396	140.01		
	Total	64848	399			

Table 3 displayed that for all parts of science $p < 0.05$ levels of significance. This employs that the difference among male and female students of ECE and non ECE background over academic achievement in science subject at elementary stage is significant. So, the null the hypothesis that 'there is no significant difference between the academic achievement of male and female students in science with ECE and non ECE background at elementary level', is completely rejected. To further explore the difference among the various factors, consider the post hoc analysis in tables 4, 5, 6, and 7 for gender difference over students' academic achievement in the subject of science at elementary level.

Table 4

Post hoc analysis for Gender difference in the academic achievement of students for ECE and Non ECE background in biology portion of the science subject

(I) Group	(J) Group	M.D (I-J)	SE	Sig.
ECE Male	Non ECE Male	1.820*	0.656	0.030
	Non ECE Female	2.080*	0.656	0.009
	Non ECE Female	3.390*	0.656	0.000
ECE Female	Non ECE Male	3.130*	0.656	0.000
	ECE Male	1.310	0.656	0.191
Non ECE Male	Non ECE Female	0.260	0.656	0.979

* The mean difference is significant at the 0.05 level

Table 4 revealed the gender difference in the academic achievement of the students in the biology part of science with ECE and non ECE background. For $p < 0.05$, the mean difference between ECE male and non ECE male, between ECE male and non ECE female, between ECE female and non ECE female, between ECE female and non ECE male is (1.820*), (2.080*), (3.390*), and (3.130*) respectively, which are significant. So, the null the hypothesis that 'there is no significant difference between the academic achievement of male and female students in science with ECE and non ECE background at elementary level' is completely rejected. Hence, ECE male was significantly better in the academic achievement for the biology part of science than non ECE male and non ECE female. Further, ECE female was significantly better in the academic achievement for the biology part of science than non ECE female and non ECE male. Though, for $p < 0.05$, the mean score difference among ECE female and ECE male, and between non ECE male and non ECE female is (1.310), (0.260) respectively, which is not significant. Therefore, ECE female and ECE male were both same and non ECE male and non ECE female were also same in their academic achievement for the biology part of the science subject at elementary level.

Table 5

Post hoc analysis for Gender difference in the academic achievement of students for ECE and Non ECE background in chemistry portion of the science subject

(I) Group	(J) Group	M.D (I-J)	SE	Sig.
ECE Male	Non ECE Male	4.430*	0.6014	0.000
	Non ECE Female	3.300*	0.6014	0.000
	ECE Female	1.710*	0.6014	0.024
ECE Female	Non ECE Male	2.720*	0.6014	0.000
	Non ECE Female	1.590*	0.6014	0.042
Non ECE Female	Non ECE Male	1.130	0.6014	0.239

* The mean difference is significant at the 0.05 level

Table 5 indicated the gender difference in the academic achievement of the students in the chemistry portion of science with ECE and non ECE background. For $p < 0.05$, the mean difference between ECE male and non ECE male, between ECE male and non ECE female, between ECE male and ECE female, between ECE female and non ECE male, between ECE female and non ECE female is (4.430*), (3.300*), (1.710*), (2.720*), and (1.590*) respectively, which are statistically significant. So, the null the hypothesis that 'there is no significant difference between the academic achievement of

male and female students in science with ECE and non ECE background is completely rejected. Hence, ECE (male) was significantly better in the academic achievement for the chemistry part of the science subject than Non ECE male, female, and ECE Female. Further, ECE female was significantly better than Non ECE male and female for their performance in the test. Though, for $p > 0.05$, the mean score difference among non ECE female and non ECE male is (1.130), which is not significant. Therefore, they were same in the academic achievement in the chemistry part of science subject at elementary level.

Table 6

Post hoc analysis for Gender difference in the physics portion of the academic achievement for ECE and Non ECE students

(I) Group	(J) Group	M.D (I-J)	SE	Sig.
ECE Male	Non ECE Male	5.190*	0.74631	0.000
	Non ECE Female	4.250*	0.74631	0.000
	ECE Female	1.670	0.74631	0.115
ECE Female	Non ECE Female	2.580*	0.74631	0.003
	Non ECE Male	3.520*	0.74631	0.000
Non ECE Female	Non ECE Male	0.940	0.74631	0.589

* The mean difference is significant at the 0.05 level

Table 6 displayed the gender difference in the academic achievement of the students with ECE and non ECE background for the physics part of the science subject. For $p < 0.05$, the mean difference between ECE male and non ECE male, between ECE male and non ECE female, between ECE female and non ECE female, between ECE female and non ECE male is (5.190*), (4.250*), (2.580*), and (3.520*) respectively, which are significant. So, the null the hypothesis that 'there is no significant difference between the academic achievement of male and female students in science with ECE and non ECE background at elementary level', is completely rejected. Hence, ECE (male) was significantly better than Non ECE (male and female) for their performance in the test. ECE (female) was significantly better in academic achievement in the physics part of science than non ECE (female and male). Although, for $p > 0.05$, the difference between mean scores of ECE (male and female), between non ECE female and male is (1.670), and (0.940) respectively. These differences are not statistically substantial. The null hypothesis is thus, accepted. Hence, both the groups of students i.e. ECE male and female were same and Non ECE female and male were same in their academic achievement in the physics part of the science subject at elementary level.

Table 7

Post hoc analysis for gender difference in the overall science of the academic achievement for ECE and Non ECE students

(I) Group	(J) Group	M.D (I-J)	SE	Sig.
ECE Male	Non ECE Male	11.44*	1.673	0.000
	Non ECE Female	9.63*	1.673	0.000
	ECE Female	2.07	1.673	0.604
ECE Female	Non ECE Male	9.37*	1.673	0.000
	Non ECE Female	7.56*	1.673	0.000
Non ECE Female	Non ECE Male	1.81	1.673	0.701

* The mean difference is significant at the 0.05 level

Table 7 indicates the gender disparity in the academic achievement of the students with ECE and non ECE background in the overall science subject. The mean difference between ECE male and non ECE male, between ECE male and non ECE female, between ECE female and non ECE male, between ECE female and non ECE female is (11.440*), (9.630*), (9.370*), and (7.560*) respectively, which are significant. So, the null hypothesis that 'there is no significant difference between the academic achievement of male and female students in science with ECE and non ECE background at elementary level', is completely rejected. Hence, ECE male was significantly better than Non ECE male, non ECE female for their performance in the test. ECE females were significantly better than Non ECE male and non ECE female in academic achievement in the science subject. However, the mean difference between ECE male and ECE female, and non ECE female and non ECE male is (2.070), and (1.810) correspondingly, which is not substantial. The null hypothesis is thus, accepted. Hence, students of both groups i.e. ECE (male) and ECE (female) were same. The groups, non ECE female and non ECE male, were same in their academic achievement in the subject of science at elementary level.

Conclusion and Discussion

Students with ECE background are ahead in academic achievement than Non ECE background students. Further, the ECE students are higher in academic achievement for each part (biology, chemistry, and physics) and in overall science subject. So, pre-school program has greater impact on academic achievement at elementary level science. This finding is in complete agreement with results of the studies of (Barnett, 1995; Taiwo &

Tyolo, 2002; Slaby et al, 2005; Magnuson et al, 2007; Fitzpatrick, 2008; Osakwe, 2009; Berlinski et al, 2009; Bibi & Ali, 2012, Eweniyi, 2012; Rashid et al, 2013; Auger et al, 2014; Savaş & Gürel, 2014; and Eshetu, 2015). Furthermore, the ECE (male) was significantly better than the non ECE (male and female); and ECE (female) was significantly better than Non ECE (male and female) students in their performance on academic achievement in the science subject. So, the students with ECE background were superior to non ECE experience students. These findings are in complete corroboration with the outcomes of studies (Barnett, 1995; Taiwo & Tyolo, 2002; Slaby et al., 2005; Magnuson et al., 2007; Fitzpatrick, 2008; Osakwe, 2009; Berlinski et al., 2009; Bibi & Ali, 2012; Eweniyi, 2012; Rashid et al., 2013; Auger et al, 2014; Savaş & Gürel, 2014; Eshetu, 2015). The ECE (male) students were higher in academic achievement than ECE (female) students in the chemistry portion of the science subject. Extra coaching or tuition might be the reasons of this superiority. However, male and female students with similar background of schooling remain the same in their academic achievement each in parts; biology, chemistry, and physics specifically and in subject of science generally at elementary level.

The following conclusions were drawn on the basis of findings; the ECE students are higher in academic achievement than non ECE background students in science generally and for each part (biology, chemistry, and physics) of science subject specifically. The pre-schooling has greater effect on students' academic achievement in science at elementary level. Further, ECE (male) was significantly better in the academic achievement in science (including biology, chemistry, and physics parts) than non ECE (male) and non ECE (female) respectively; the ECE (female) was significantly better in the academic achievement in science (including biology, chemistry, and physics parts) than non ECE (male) and non ECE (female) students. However, the ECE male and female students were same in their academic achievement in the subject of science for the biology, and physics portions; non ECE female and male students were same in their academic achievement in the subject of science for the biology, chemistry, and physics portions. Moreover, ECE (male) was significantly better in the academic achievement of their performance in chemistry part than non ECE (female) students at the elementary level.

Recommendations

Considering the manifold profits of early childhood education for all-round improvement and academic performance of children in their future

life, there is the requirement of cooperation amongst participants at all levels to increase the facility largely to the poor, rural and remote people, because currently, the ECE service is only limited to urban areas. Further, pre-schooling program needs to be introduced in order to abolish the concept of non ECE schooling. The Government should make it possible to encourage this program by providing educational facilities (classrooms, instructional materials, and equipment etc.) at pre-primary, primary, and elementary levels. The importance of ECE can be highlighted through proper enlightenment campaign. The educational managers may offer suitable programs, policies and curriculum in this case. In-service teacher-trainings about ECE courses may be organized to develop their instructional skills and these well-trained teachers must be supplied to the government schools to fulfill the demands of children at pre-primary, primary and elementary level. School authorities should pay special attention to develop the permissive atmosphere of pre-primary classes about display materials and learning centers. Furthermore, more research studies with larger sample size need to be carried out.

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