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Environmental Education Awareness and Practices: A Comparison of ECE Trained and Untrained Teachers

Dr. Sadaf Jabeen (Assistant Professor)
Department of STEM Education, Lahore College for Women University, Lahore Pakistan

***Dr. Tahira Kalsoom (Assistant Professor)**
Department of STEM Education, Lahore College for Women University, Lahore Pakistan

Dr. Afifa Khanam
Department of STEM Education, Lahore College for Women University, Lahore Pakistan

Azhera Eram (Head Mistress)
Government Girls High School,, MianChannu, Khanewal, Pakistan

Corresponding Author *Email:* tahira.kalsoom@lcwu.edu.pk

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Abstract: The aim of this study was to compare awareness and practices of environmental education for sustainable development among ECE trained and untrained teachers in order to evaluate effectiveness of training provided to ECE teachers. This was a descriptive study and survey research design was used following quantitative approach. Questionnaire was developed as a tool for the survey. The validity of the questionnaire was ensured by the experts' reviews. Sample of the study consists of 464 teachers and head teachers from schools in district Khanewal. There are 114 schools in district Khanewal with ECE facilities and trained teachers. Random sampling technique was used to select 10% of the remaining 1194 schools with teachers not trained for ECE from the four tehsils of district Khanewal. The descriptive statistics and t-test was used to analyze the data. The results showed that there was a significant difference in the awareness of environmental aspect of education among trained ECE teachers and untrained ECE teachers. Findings will be beneficial for professional development institutions to explore the effectiveness of their efforts regarding awareness and practices of ECE teachers in the area of environmental education.

Keywords: *Early Childhood Education; Training; Awareness; Practices; Environmental Education Sustainable Development*

1. Introduction

Neurological studies have determined that around the age of three, the brain development of children is at very high potential(Tierney, & Nelson, 2009), so at this time there is a need of an appropriate

stimulating learning environment that may include a simple playing activity. It can elevate the brain's physical size (Ministry of Education, 2009). At this age, children can be involvedin the collective environmental and community issues (Davis, 2013) Early Childhood Education for Sustainability (ECEFS) can be suggested as useful commencement for making a sustainable society in future by indulging little minds of children in various practices and activities and imparting awareness and knowledge about sustainable environmental education. Experts proposed that the training of some matters like social subjects, environmental protection, observance of personal healthcare, and sense of responsibility should be initiated at childhood as it is noted that students guided and taught at primary level were supposed to have more social capacities and basic rational in the future (Araghieh, 2012).

The Sustainable Development Goals (SDGs) are also known as "Transforming our World; 2030 Agenda for Sustainable Development". It is a set of 17 Goals aspired for accomplishment by the year 2030. SDG's indicate comprehensive framework of the three scopes of sustainable development, which include social, environmental and economic. On the SDG index, Pakistan ranked 122 out of 157 nations. SDGs are most recent to pay attention on sustainability at Early Childhood (ECE) level (UNESCO, 2015).

Early Childhood Education (ECE) is defined as pre-primary or, "*katchi*" it can be termed as the services of informal and formal, public and private education for children of three to five years of age. In Pakistan schools, the terms, "*nursery*" and "*kindergarten*" are interchangeably used with no practical difference in their teaching styles or curriculum. Technically, the concept, "*Montessori*", indicates a specialized and specific approach of ECE teaching, which requires particular kind of teacher training, classroom environment and particular materials (International Bureau of Education, 2006).After 1990, a lot of work and reforms were done on ECE in Pakistan. For pre-service ECE, B.Ed. programs were developed for ECE in the Universities as well as in GCETs.

Davis (2009) statedthatthere is a deficiency of research on EFS/EE/ESD in early childhood and poor documentation of EFS/EE/ESD practices in early childhood programs. This is caused by the lack of attention on environmental sustainability and lack of concentration of researchers on early years of education (Kaga, 2008). There is a research gap in environmental education (EE) among early childhood and in education for sustainability (EFS) (Davis, 2009). This research gap could be filled by promoting new research projects especially on the early childhood education for sustainability.

Environmental education is the set of cumulative thinking approach for the betterment of environment. It does not only include the individual concern but also expand to the national and global concern in common for all the nations and people. There is need to adopt the motivation for environmental education to secure national and global stake. To ensure a secure environment, it clearly put importance on avoiding those activities which destroys and leaves bad impacts on environment (Kalsoom, Jabeen& Fatima, 2020;Firoozi, 2005).

Training programs on environmental management and conservation can be designed for school, teachers, university students, and for members of all sectors in the society (Williams & Chawla, 2015).Summers et.al (2014) conducted a study on nine primary teachers who took part in a professional development program arranged on environmental aspect of education for sustainable development and the National Curriculum. In this study they found out that how the conceptions of education for sustainable development compare with the teachings.

Heidari (2015) evaluated the environmental awareness of teachers at the Tehran's elementary schools. As the teachers' awareness of environmental aspects and teaching the students tell us the reality of safe environment. The study concluded insufficient awareness of teachers about environmental awareness.

The level of awareness about environmental damage, environmental protection and the need of activities for sustainable environment is the environmental knowledge Barata, Castro, & Martins-Loução, 2016). The attitude towards environmental protection concepts and activities is the reflection of environmental knowledge. It is the key to initiate the response towards global environmental protection (Jóhannesson, et. al., 2011; UNESCO, 2015). With appropriate knowledge, the reasons of environmental damage, the ways to address the issue and motivation of an individual or a group can effectively do the part for environmental protection (O'Flaherty & Liddy, 2017).

Most of the teachers even today are not even aware of what environmental education was all about. Hence it could be concluded that environmental education has not properly taken off in Primary school Teachers in Pakistan. So formal educators and awareness program leaders in developing countries require more educational resources and environmental education training programs (Kalsoom, Jabeen& Fatima, 2020).

A research survey (Williams & Chawla, 2015) revealed that there are no adequate resources for teaching environmental education in the four Kenya primary teacher colleges sampled. Most of the teachers were not even aware of what environmental education was all about. According to Ellis & Weekes (2008), formal educators and awareness program leaders in developing countries require more educational resources and environmental education training programs.

A recent survey conducted (O'Flaherty & Liddy, 2017) on the views of prospective primary school teachers regarding environmental education in Turkey revealed greater need of visual teaching aids. According to Lotz-Sisitka (2015) In Africa neither of the schools have any form of environmental education books, wall chart or posters particularly the government schools. In Nigeria, facilities and resource-persons to teach environmental education are respectively inadequate and not up-to-task. Training institutions may encompass environmental education content in their training modules to reduce environmental degradation and their impacts to human and biodiversity existence on earth(Baily, O'Flaherty, & Hogan, 2017).

Quaid-e-Azam Academy for Educational Development (QAED) Punjab, has introduced Early Childhood Education (ECE) in various primary schools of Punjab approximately up to 1000 schools with the improvement of environment of School to convert them into child friendly schools (CFS's).QAED trainings educate the teachers in order to encourage harmony in peoples' life as linked to the surrounding environment. QAED is continuously arranging ECE teacher trainings for playing its part in environmental sustainability and government is funding it to promote education for sustainable development with the help of UNESCO.

In these training sessions, the ECE teachers are guided to use that activities in classroom which directly affect the children in following fields; personal and social growth, language and literacy, basic concepts of math, the world around us, hygiene and creativity. Environmental education by QAED aims at increasing awareness related to the environment, to create best attitudes and behavioral changes, the protection of the natural environment and the repair of the damaged environment.The trained ECE teacher engage the children in activities related to the protection of environment by the conservation of resources i.e. Energy, water and recycling of waste. QAED is implementing following measures "*doing more*

with less" and "*making more use of old things*". It includes the following measures inside and outside the classroom:

1.1 Reduce and Reuse

1. Reuse the old materials, repair items, arrange old toys exhibition in class and encourage children to have packed lunches without throw away packaging
2. Motivate children to collect different recycling collections (E.g., cardboard, plastic bottle, ink cartridges) in separate recycle bin and trash bin in class room and encourage paper conservation.
3. Promote School-wide, annual environmental events, such as Earth Hour, Earth Day/Week, Walk to School Day etc

1.2 Energy Conservation

1. Leaving lights off when unnecessary, put off the fan when children go out from class room in the break or when school time is off
2. Prefer low energy consumption appliances, do not standby the electronics as computers, printers, scanners, etc. are when not in use, and turned off at the end of the day.
3. Demonstrate model project on energy conservation to children and display a checklist for it.

1.3 Water conservation

1. Motivate children not to left dripping taps in the school and don't left the water tap open etc. Close the button when the water tank is full and Use water from water cooler or dispenser for drinking purpose only
2. Motivate children not to throw garbage in the running water

1.4 Plantation and Green activities

1. Promote activities of planting and growing and do not allow plucking the flowers and destroying them.
2. Provide a sharing environment in the classroom so that children share ways to rethink, refuse, reduce, reuse.
3. Arrange out door trips to make understand the nature so that children spend most of their time outdoors in all weathers.
4. Focus on warm, accepting and nurturing atmosphere so that children feel secure in their explorations of atmosphere. Teachers should model interest in and enjoyment of the natural world because children emulate their teachers

In most schools of Punjab, there are developed and well decorated ECE rooms with trained ECE teachers but there are untrained ECE teachers with ordinary nursery classrooms as well, there are no prescribed parameters to evaluate and asses the level of awareness of environmental sustainability of ECE teachers. After launching training programs for ECE teachers by QAED, using extra budget for it, there is need to find out either the QAED is gaining the prospective targets, and explore the effectiveness of these trainings in shaping the efficiency of ECE teachers.

This study describes the current level of awareness and practices of environmental aspect of education for sustainable development among ECE teachers at Khanewal. This study also aims to finds out the differences of trained ECE teachers and untrained ECE teachers in view of the awareness and practices of environmental aspect of education for sustainable development. The study sought to explore following objectives and hypothesis:

1. To explore the current level of awareness and practices of environmental aspect of education among ECE trained and untrained teachers.
2. To analyse the difference in the awareness and practices of environmental aspect of education among trained ECE teachers and untrained ECE teachers.
   i. H_0:There is no significant mean difference in the awareness of environmental aspect of education among trained ECE teachers and untrained ECE teachers.

   iiH_0:There is no significant mean difference between environmental practices of ECE trained and untrained teachers.
3. To investigate the gap between training and practices of ECE teachers and the reasons of gaps between trainings and practices of ECE teachers (if any).

2. Methods and Procedures

2.1 Research Design

The study followed quantitative approach with descriptive survey research design.

2.2 Population and Sampling

The participants of this research were the teachers and head teachers from 1303 schools from the four tehsils of district Khanewal. There are 114 schools with trained ECE teachers and 1189 schools with untrained ECE teachers in the district. Division of target population in four tehsils is given as: Mian Channu(166 schools), Khanewal(340 schools),Jahania(303 schools), Kabirwala, (494 schools). Random sampling technique was used for drawing sample from the population. Among 1189 schools with untrained ECE teachers, 118 (10%) school are taken as sample. Among 114 schools with untrained ECE teachers, 114 (100%) school are taken as sample. This comprises the total 232 schools for sample population as: One teacher and one head teacher from 232 schools comprised the total sample of 464 teachers and head teachers.

2.3Instrument

The researcher developed the questionnaire, Scale of Awareness and Practices of Environmental Education (SAPEE) for the research. The research instrument consisted of 70 items initially. For validity test of the tool, the tool was reviewed by two senior university professors from department of Environmental Science, and one senior official at Environment Protection department. Four items were discarded due to unclear language and grammatical errors. For the reliability of the questionnaire, Questionnaire was filled by 46 (10%) of teachers and their responses were put into pilot testing. Cronbach's Alpha (α) value of their responses was calculated through SPSS and reliability of the questionnaire was$\alpha \geq 0.836$, which was considered reasonable for conducting the research. Six more items were excluded because of low reliability ranging from 1.02-2.87. Questionnaire was sent to 464 participants including teachers and head teachers. Data was collected through personal visits and email as well.

2.4 Data Analysis

Descriptive statistics as well as inferential statistics including means, percentages, frequencies and independent sample t-test were used to obtain results.

3. Findings

Table 1

Demographics Frequency Table

		F	Percentage
Gender	Male	198	42.7%
	Female	266	57.3%
Age	26-35	177	38.1%
	36-45	287	61.9%
Highest level of education	Master	324	69.8%
	Bachelor	96	20.7%
	Intermediate	44	9.5%
Job experience	5-10 years	49	10.6%
	11-15 years	374	80.6%
	16 or more years	41	8.8%
ECE Training	Trained	228	49.1%
	Untrained	236	50.9%

Table 1 shows that 198(42.7%) among the participants were male and 266(57.3%) were female. Majority of the participants were female teachers. Age wise majority of participants belonged to 36-45 group 287 (61.9%) and 177(38.1%) belonged to 26-35 age group. Majority of participants 324 (69.8%) had Master level of qualification. Second major group 96 (20.7%) had Bachelor qualification. A small group of teachers 44 (9.5%) had Intermediate qualification. This group belonged to senior teachers group having long experience in teaching. Majority of participants 374 (80.6%) had 11-15 years' experience in education. Teachers with 5-10 years' experience were 49(10.6%). Among participants, 228 (49.1%) had received ECE training and 236(50.9%) had not received ECE training.

Awareness and practices of Environmental Education among trained and untrained teachers

Level of awareness of Environmental Education among trained and untrained teachers was analyzed with responses to questions related to environmental awareness.

3.1 Plantation and Green activities

Table 2: *Finding Electronic Print and Social Media Programs Useful for the Awareness of Environmental Issues.*

ECE Teachers		Neutral	Agree	Total
Trained	F	0	228	228
	Percentage	0	100.0	100.0
Untrained	F	192	44	236
	Percentage	81.4	18.6	100.0
Total	F	192	272	464

Table 2 demonstrated that among ECE trained teachers 100% teachers agreed with the statement. This showed high level of awareness and practice of getting information about environmental issues. On the other hand, only 18.6% untrained teachers agreed and 81.4% remained neutral in their response. This showed that level of environmental awareness of untrained teachers was low.

Table 3: *Global Warming is Causing a Gradual Increase in the Temperature of the Earth's Atmosphere*

ECE Teachers		Disagree	Neutral	Agree	Strongly Agree	Total
Trained	F	0	23	116	89	228
	Percentage	0	10.1	50.9	39.0	100.0
Untrained	F	66	100	70	0	236
	Percentage	28.0	42.4	29.7	0.0	100.0
Total	N	66	123	186	89	464

Table3 showed that among ECE trained teachers 90% teachers agreed with the statement. This showed high level of awareness regarding a serious environmental issue. On the other hand, only 29.7% untrained teachers agreed and 42.4% remained neutral in their response. There were 28% untrained teachers who disagreed to the impact of global warming on rise of temperature of the Earth's atmosphere. This showed that level of environmental awareness of untrained was low.

Table 4: *Global Warming can Best be Treated Through*

		Planting trees	Buying local food	Environmental education	All of the above	Total
Trained	F	100	0	94	34	228
	Percentage	43.9	0.0	41.2	14.9	100.0
Untrained	F	52	136	26	22	236
	Percentage	22.0	57.6	11.0	9.3	100.0
Total	F	152	136	120	56	464

Table 4 demonstrated that major portion of the trained teachers 43.9% have awareness about plantation as the solution to global warming. Among trained teachers, 41.2% have opted for environmental education. This showed high level of environmental awareness among ECE trained teachers. Among untrained teachers, 57.6% have selected buying local food and 22.0% opted for planting trees. This showed low level of awareness about environmental activities as only 9.3% among untrained teachers considered all of the activities for awareness.

Table 5: *Like to Pay more for Environmental Friendly Products*

ECE Teachers		Neutral	Agree	Total
Trained	F	63	165	228
	Percentage	27.6	72.4	100.0
Untrained	F	192	44	236
	Percentage	81.4	18.6%	100.0
Total	F	255	209	464

The above table 5 showed high level of awareness regarding use of environment friendly products by the trained teachers as compared to untrained teachers, only 18.6% teachers agreed and 81.4% remained neutral in their response. Majority of untrained teachers were uncertain about the importance of use of environment friendly products.

Table 6: *Like to take part in any environmental activities (garbage collection, planting etc.)*

ECE Teachers		Disagree	Neutral	Agree	Strongly Agree	Total
Trained	F	0	0	0	228	228
	Percentage	0.0	0.0	0.0	100.0	100.0
Untrained	F	99	106	31	0	236
	Percentage	41.9	44.9	13.1	0.0	100.0
Total	F	99	106	31	228	464

Table6 exposed that among ECE trained teachers 100% teachers agreed with the statement. This showed high level of awareness regarding environmental activities. Among untrained teachers, only 13.1% teachers agreed and 44.9% remained neutral in their response and 41.9% disagreed. This showed that level of environmental awareness of untrained was low and therefore they had no motivation for environmental activities. Majority of untrained teachers were uncertain about the importance of environmental activities.

Table 7: *Arrange Outdoor Activities for Students to Meet Nature*

ECE Teachers		Disagree	Neutral	Agree	Total
Trained	F	0	3	225	228
	Percentage	0.0	1.3	98.7	100.0
Untrained	F	226	0	10	236
	Percentage	95.8	0.0	4.2	100.0
Total	F	226	3	235	464

Table 7 reflected that 98.7% of trained teachers agreed with the statement to have the practice of taking students for outdoor environmental activities like plantation and green activities. This showed high level of environmental practices among trained teachers. Among untrained teachers, only 4.2% agreed and 95.8% disagreed with the statement.

Table 8: *Take Students to the Garden to Encourage them for Growing Plants, Watering and Taking Care of Them*

ECE Teachers		Never	Sometimes	Always	Total
Trained	F	0	26	202	228
	Percentage	0.0	11.4	88.6	100.0
Untrained	F	58	163	15	236
	Percentage	24.6	69.1	6.4	100.0
Total	F	58	189	217	464

Table 8 demonstrated that 88.6% of trained teachers always made arrangements for outdoor plantation and green activities. This showed high level of environmental practices.

Among untrained teachers, 69.1% have sometimes taken students for green activities. 24.6% have never done this practices.

3.2 Water Conservation

The level of awareness about conservation of water resources is important to know for effective and fruitful environmental practices. Responses of both groups of teachers are given below for question related to water conservation.

Table 9: For *Caring Water Reserves, the most Applicable way to Save Water is*

		Careful use	Monitor our water bills	Awareness of importance	All of above	Total
Trained	F	89	0	117	22	228
	Percentage	39.0	0.0	51.3	9.6	100.0
Untrained	F	207	29	0	0	236
	Percentage	87.7	12.3	0.0	0.0	100.0
Total	F	296	29	117	22	464

Table9 exposed that major portion of the sample 296 (63.79%) have selected *Careful use* as the most applicable way to save water. Among these there were 88% untrained teachers and 39% trained teachers. This shows that majority of untrained teachers consider *Careful use* is the best applicable way to save water. 12% untrained teachers have opted for *Monitor our water bills*, which the least effective way in this regard. No untrained teachers have opted for *Awareness of importance*. Among ECE trained teachers, 51% have opted for *Awareness of importance*, which is the most effect way to save water and 10% ECE trained teachers have opted for all these options respectively. This showed more level of awareness and environmental practices among ECE trained teachers than untrained teachers.

Table 10: *Water Pollution has Affected Habitat for Animals Eco System*

ECE Teachers		Neutral	Strongly Agree	Total
	F	63	165	228
Trained	Percentage	27.6	72.4	100.0
Untrained	F	65	171	236
	Percentage	27.5	72.5	100.0
Total	F	128	336	464

Table 10 reflected that among ECE trained teachers 72.4% teachers agreed with the statement and 27.6% remained neutral. Among untrained teachers, 72.5% teachers agreed and 27.5% remained neutral in their response. This showed that both ECE trained and untrained teachers have awareness about impact of pollution on habitat for animal's system.

Table 11: *Quality of Underground Water around the Area has been Decreased*

ECE Teachers		Disagree	Neutral	Agree	Strongly Agree	Total
Trained	F	0	0	0	228	228
	Percentage	0.0	0.0	0.0	100.0	100.0
Untrained	F	99	106	31	0	236
	Percentage	41.9	44.9	13.1	0.0	100.0
Total	F	99	106	31	228	464

Table 11 showed that 100% of trained teachers agreed with the statement. Among untrained teachers, 44.9% remained neutral and 13.1% agreed. There were 41.9% who disagreed with the statement. This showed low level of awareness about damage to underground water reserves among untrained teachers.

Table 12: *Trained students not to Spoil Running Water by Throwing Garbage or any Litter*

ECE Teachers		Never	Always	Total
Trained	F	0	228	228
	Percentage	0	100.0	100.0
Untrained	F	137	99	236
	Percentage	58.1	41.9	100.0
Total	F	137	327	464

Table 12 exposed that 100% of trained teachers agreed with the statement. Among untrained teachers, 58.1% disagreed. This showed low level of environmental protection practices about water conservation among untrained teachers.

3.3 Energy Conservation

Table 13: *Trained my Students to Save Energy for Better Environment*

ECE Teachers		Disagree	Neutral	Agree	Total
Trained	F	0	26	202	228
	Percentage	0.0	11.4	88.6	100.0
Untrained	F	23	140	15	236
	Percentage	10.0	59.1	6.4	100.0
Total	F	0	0	189	217
	Percentage	10.0	70.5	40.7	46.8

Table 13 showed that among ECE trained teachers 88.6% teachers agreed with the statement and 11.4% remained neutral. Among untrained teachers, only 6.4% teachers agreed and 59.1% remained neutral in their response. This showed that ECE trained teachers practically involve their students in saving energy.

Table 14: *Encourage my Students and they make Efforts to Apply their Skills and Knowledge to*

ECE Teachers		Plant trees	Waste reduction	Energy conservation	All of above	Total
Trained	F	12	74	114	28	228
	Percentage	5.3	32.5	50.0	12.3	100.0
Untrained	F	123	54	43	16	236
	Percentage	52.1	22.9	18.2	6.8	100.0
Total	F	135	128	157	44	464

Table 14 reflected that 50% participants among trained teachers have encouraged their students for energy conservation, 32.5% have emphasis on waste reduction. Among untrained teachers, 52.1% have encouraged their students to plantation, 22.9% for waste reduction and 18.2% have encouraged for energy conservation. A smaller portion of untrained teachers reflected to encourage their student to apply knowledge and skill for energy conservation. This level of awareness is alarming. Teacher need more consideration for creating motivation among student on energy conservation.

3.4 Reduce and Reuse

Table 15: *Encourage my Students for Paper Conservation*

ECE Teachers		double-sided printing	font size adjustment	Reuse of print paper	Careful use of notebooks	All of above	Total
Trained	F	82	19	23	87	17	228
	Percentage	36.0	8.3	10.1	38.2	7.5	100.0
Untrained	F	200	0	0	36	0	236
	Percentage	84.7	0.0	0.0	15.3	0.0	100.0
Total	F	282	19	23	123	17	464

Paper conservation is an environmental practice for saving more trees. Every piece of paper we save will participate in the effort to save trees. Table 15 showed that among ECE trained teachers, 38.2% have encouraged their students for paper conservation through careful use of notebooks, 36% have suggested printing both side of paper where possible. Among untrained teachers, 34.7% have suggested double side printing. Only 15% teachers suggested careful use of notebooks which is a more applicable practice for the sake of paper conservation.

Table 16: *Voice Against Causing Damage to the Environment*

ECE Teachers		Never	Sometimes	Always	Total
Trained	F	7	186	35	228
	Percentage	3.1	81.6	15.4	100.0
Untrained	F	227	9	0	236
	Percentage	96.2	3.8	0.0	100.0
Total	F	234	195	35	464

Table16 demonstrated that among trained teachers only 35(15.4%) always raised their voice against damage to the environment. This smaller proportion showed a clear lack of initiative among teachers. 186(81.6%) showed a response sometimes. It means they have causally taken this imitative. Among untrained teachers, majority 227(96.4%) never raised their voice. This showed a clear lack of awareness and practices. This factor needs to be addresses. People, especially teacher should to be more proactive against activities and processes which damage environment. Awareness regarding usefulness of social media for environmental education should be created.

Table 17: *Refuse to use Plastic Bags for Goods* Instead I use and *Recommend my Students to use Paper or Cloth Bags*

ECE Teachers		Never	Sometimes	Always	Total
Trained	F	41	32	155	228
	Percentage	18.0	14.0	68.0	100.0
Untrained	F	203	19	14	236
	Percentage	86.0	8.1	5.9	100.0
Total	F	244	51	169	464

Table 17 showed that only 68% trained always refused to use extra plastic bags for goods. Only 14% showed sometimes. Majority of untrained teachers86% never refused to use extra plastic bags for goods. Plastic bags are the major source in land pollution. It needs maximum reduce policy. Responses from untrained teacher showed lack of awareness and practices for this environmental aspect.

Table 18: *I appreciate and encourage my students about reusing of plastic material*

ECE Teachers		Never	Sometimes	Always	Total
Trained	F	4	169	55	228
	Percentage	1.8	74.1	24.1	100.0
Untrained	F	184	46	6	236
	Percentage	78.0	19.5	2.5	100.0
Total	F	188	215	61	464

Table 18 demonstrated that 24.1%trained teachers said that people always appreciated reuse of plastic bags as much as possible and 74.1% have sometimes suggested. Majority of untrained teachers78% of participants said that people always appreciated reuse of plastic bags.

3.5 Comparison of Environmental Awareness and Practices between Trained and Untrained Teachers

To compare the awareness and practices of ECE trained and untrained teachers about environmental aspect of education for sustainable development independent sample t-test was applied to the gathered data.

Table 19: *Independent sample t test on Comparison of Environmental Awareness*

ECE Teachers	N	Mean	SD	Mean Difference	T	*p*	Decision
Trained	228	3.9982	0.08222	0.84027	28.193	0.000	H0 rejected
Untrained	236	3.1579	0.44270				

Table 19 reflected that mean value of environmental awareness for ECE trained teachers is 3.99, which is almost equal to "*Agree*" response according to Likert-scale used. The mean for ECE untrained teachers is 3.1, which is a little more than the response "*Neutral*". This means that average response of ECE untrained teachers related to awareness question is neither agree nor disagree. To check and analyze this mean difference in awareness among ECE trained and untrained teachers, t-test result are presented. The results showed that value of $p < 0.001$, which means the result is statistically significant. We reject the null hypothesis and accept alternative hypothesis. Mean difference value is 0.84 between ECE trained and untrained teachers. Hence it proves that there is a significant difference in the awareness of environmental aspect of education among trained ECE teachers and untrained ECE teachers.

Table 20: *Independent sample t test on Comparison of Environmental Practices*

ECE Teachers	N	Mean	SD	Mean Difference	T	*p*	Decision
Trained	228	4.0777	0.20786	0.88702	28.366	0.000	H0 rejected
Untrained	236	3.1907	0.42568				

Table 20 demonstrated that means of environmental practices items for ECE trained teachers is 4.0, which is more than "*Agree*" response according to Likert-scale used. The mean for ECE untrained teachers is 3.19, which is a little more than the response "*Neutral*". This means that average response of ECE untrained teachers related to practices question is neither agree nor disagree. This shows a major gap between environmental practices among trained ECE teachers and untrained ECE teachers. To check and analyze this mean difference in environmental practices among ECE trained and untrained teachers, t-test result are presented. The results showed that value of $p < 0.001$, which means the result is statistically significant. We reject the null hypothesis and accept alternative hypothesis. Mean difference is 0.887, which shows a gap in environmental practices among both groups. Hence it proves that there is a significant mean difference between environmental practices of ECE trained and untrained teachers.

3.5Reasons of gaps between training and practices of teachers

Table 21: *Reasons of gaps between training and practices*

Gaps	Reasons	Trained	Untrained
ECE training is not fruitful	Training objectives are not effective	21%	0%
Awareness programs not arranged	Lack of resources	38%	42%
Society not participating actively	Lack of public awareness	12%	24%
Outdoor activities not scheduled	Lack of management support	18%	14%
Social campaigns	Time constrains Lack of resources	11%	5%

Table 21 showed that among trained teachers 38 % considered lack of resources for environmental practices is the main gap. Ineffective training objectives were answered by 21 % as the gap. 18% considered lack of public awareness, 12% responded that lack of management support and 11% identified time constrains in duty hours as the gap between training and practices. Among trained teachers 42 % considered lack of resources for environmental practices is the major gap. The lack of resources are insufficient visual displays to be displayed at appropriate wall location in each ECE classrooms. There is no environmental awareness manual for the teacher. So that teacher can read the manual and become familiar with the various environmental issues identified. There is no curriculum planning for introducing environmental issues, projecting the concept of sustainable development. It is expected that the teacher will explain important keywords such as waste management; proper disposal of human and animal wastes, waste sorting at homes. As untrained teachers have not received ECE training, they have not mentioned about training objectives. 14% considered lack of public awareness, 24% responded that lack of management support and 15% identified curriculum burden as the gap between training and practices. Some teachers argued that even if they attempt to adopt environmental practices like plantation campaign, green activity or competition, very less management support is provided.

4. Conclusions and Discussion

The research aimed on three objectives. The first objective was to explore the level of awareness among ECE trained and untrained teachers regarding environmental aspect of education. There was lack of awareness regarding energy conservation. This aspect is very important in terms of saving natural resources.

Teachers showed majority response towards awareness walk to promote environmental practices. Use of media and presentation was not suggested by some of the participants. Use of social media for awareness is not considered by teachers. The most alarming results were about solution to the global warming. Very small portion had responded for environmental education as the way to solution for global warming.

The research has revealed that ECE untrained teachers have less focus on adopting modern practices for development of sustainable society. Significant lack of awareness was found in terms of reduce and reuse aspect among ECE untrained teachers. ECE trained teachers have shown more emphasis on reduces and reuse practice for environmental protection and developments of sustainable society. These results have established that there is a need of compulsory ECE training for the teachers, both in-service and newly recruited teachers for improved environmental education and sustainable development.

Second objective was to compare the awareness and practices of ECE trained and untrained teachers about environmental aspect of education for sustainable development. For this, *independent sample t-test* was applied. The results showed that there was a significant difference in the awareness of environmental aspect of education among trained ECE teachers and untrained ECE teachers. This finding was supported by the results provided in Doctoral Dissertation, titled "Awareness, Knowledge, And Attitude about Environmental Education (De Lavega, 2004). The results were also in line with the findings of McKeown-Ice (2000) and Miles et al. (2006) who have proposed that pre-service and in-service training is essential for enhancement of environmental practices among teachers. Grace and Sharp (2000) proposed that the instructors should encourage the pre-service training activities for environmental education practices among teachers.

The third objective was to identify the gaps and reasons of gaps between training and practices of ECE teachers. From the gaps identified by the teachers, it was seen that majority considered lack of resources available in school were not enough to adopt and promote environmental practices. Second major reason was identified as the training objectives were not effective. The teachers considered training objectives were not aligned with ground realities of various application areas. Lack of public awareness is a reason to slow down the motives for environmental practices. If society encourages the environmental practices, it can be help to overcome certain limitation faced by the teachers i.e. arrangement support, financial support for activity, space and facility (Li & Krasny, 2019). Untrained teacher also identified lack of resources and curriculum completion burden as major reasons. Some teachers have answer that even if they attempt to adopt environmental practices like plantation campaign, green activity or competition, very less management support is provided.

5. Recommendations

The results of the study provided a base for effort and initiative to increase level of environmental awareness among teachers through professional development programs.

1. More focus on ECE training for the teachers should be made.
2. ECE Training objectives should align with resources of schools and teachers' workload.
3. Environmental awareness programs and workshops should be arranged in parallel to the training programs.
4. Awareness programs regarding usefulness of print and social media should be arranged.
5. Curriculum development should have the part for environmental education and awareness.
6. More literature related to environmental issues and practices should be made available in schools for teachers and students.

7. More research work should be promoted and encouraged for the environmental awareness and education.
8. There should be an environmental protection manual for the teachers to be practiced in ECE classroom. Teachers may be encouraged to compose recitations or poems to improve perception of earth environmental degradation by the pupils.

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