Attitude, Behavior and Responsibility to Environmental Literacy in Education Organization: A Quantitative Assessment

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Abstract: Technology and human influences are causing drastic changes to the natural environment on the globe. Since beginning of the earth, environment is ever changing on this blue planet. Life and factors of life, when interact, brings changes to the environment as a whole. But most of the time these changes, though inevitable yet causing damage to the life on earth. Under such circumstances there is always a need to understand the importance of environment around them. The present study is focused on exploring the attitude, behavior and responsibility of trainee teachers about environmental literacy in Pakistan. A standardized questionnaire was administered to collect responses of the trainee teachers. Study used convenient sampling technique and questionnaire was administered to 151 trainee teachers. Descriptive and inferential data analysis techniques were used to describe and infer the data. The study revealed that majority of trainee teachers reflect a positive attitude towards environment literacy and shown an understanding of its importance to include for teaching. The study recommended inducing environmental literacy modules to the program of trainee teachers who will be teaching in schools after completion of their study program and ultimately impacting the life of their learners.

Key Words: Environment, Environmental literacy, Attitude, knowledge, Understanding.

Introduction

The science and technology is known for bringing innovation to the living sphere but at the same time, literature is reporting the drastic impact of science and technology and its utilization on the life of this bio sphere, the most important is, impacting the environment of the bio sphere. This challenging situation increases the demand for environmentally literate individuals. Environmental literacy is a term that is first coined by Roth in the year 1968 (McBride et al, 2013). The term was then used to describe and differentiate environment literate and illiterate individuals. It was described then that environment

illiterate is the one who pollute the environment and damaging life around them. On the other hand environmentally literate individuals know how to use the environment around them and take benefit from the environment without damaging and disturbing its constitution. Soon after coining the term environmental literacy,in USA, the first National Environmental Education Act was presented in 1969 that later on signed as environmental law in 1970 (Stapp et al., 1969).

Therefore, most of the literature evident that the prime goal of environmental education is to develop the environmental literacy among individuals. Unfortunately, Nature of environmental literacy has got multi perceptual understanding of its nature and term has got multiple uses (McClaren, 2019; Bell, 2020). Emergence of post industrial society from industrial society, information society to information and technology society impact the use of term and its impact in curriculum, education and in return literature for the research (Seigner &stapner,2020). According to Khademi-Vidra, (2017), it is observed that as the field of environmental education has developed in 1990s , and hence ever more revival of the usefulness of the term environmental literacy is undertaken by the people around the globe for redefining the meaning.

Hence, It is pertinent to mention that in literature (Bissinger & Bogner,2018; Liang., etal. ,2018; Kaya & Elster, 2017) , few questions are addressed with reference to environmental literacy for example; what purposes, society is served by environmental literacy? Who is known as environmental literate and can a degree be measured for environmental literacy? What knowledge, skills, and attitudes are to be exhibited by an environmentally literate person? Why are those specific knowledge, skills, and attitudes necessary? What assessment methods can be used to assess environmental literacy?(Hollweg et al., 2011).

The present study is carried out in upper Punjab Pakistan. Pakistan, as a country is reliant on agriculture and its agricultural yields account for 26 percent of gross domestic product (GDP) (Khan, 2020). Report from agricultural census 2010, it was observed that under the influence of industrialization and urbanization, Agricultural land in Pakistan is being converted to commercial markets that is impacting not only the agricultural production but also causing an impact on the climate of Pakistan as well (Hassan, 2018). In 2012, Pakistan was at the 12th position, 8th in 2015 and at 7th place in 2017 among top countries of the world exposed to the extreme climate change (IUCN, 2009; Kreft & Eckstein, 2013; Abubakar,2017).

Recently, in Pakistan cyclones, floods, droughts, and storms have hit hard and all of these are the consequences of the climate change (Atta-ur- Rahman& Khan, 2013; Mueller et al., 2014 & Tingju et al., 2014). These disasters not only hitting the country with more frequency but causing more damage (Qasim et al., 2015). Even year after year and consistently affected by climate change, there is no effective step taken by the people and government. Climate change report said that thousands and millions of people (128,000 approx), countrywide, are killed and damaged by these disastrous climate changes (Atta-ur-Rahman & Khan, 2013). Pakistan needs a comprehensive policy to make people aware about the climate change vulnerability. Environmental literacy campaigns among masses may bring the desirous results and enable people to be responsible towards environment. The current study is an attempt in this regard.

It is therefore, Indices are developed about the environment condition and ever changing situation of environment and climate. Keeping in view the drastic impact, climate change is exerting on the bio-sphere many organizations are working to assess, measure and cure to reverse the negative impacts of climate change. Climate change vulnerability index (Edmond, Lovell & Lovell, 2020) is maintained and in one of the index Pakistan including factors temperature, precipitation, rainfall, sensitivity, drinking water etc. is mentioned as most vulnerable country to climate change i.e., German Watch report

Global Climate Risk Index reflected that Pakistan has been places on the fifth position on the list of most vulnerable countries list where climate change is impacting disastrous(Eckstein, Künzel, Schäfer & Winges, 2020) It is assumed to address the climate change issue by the country needs developing the environmental literacy of the masses and addressing issue of environment behavior and environment literacy through education. Formal, informal and non formal modes can be utilized for the purpose.

Many researches are carried out to grasp the attention of public sector education governance (Imran et.al, 2021;Khanum ,2019; Sukma,2020; Yousaf and Bhutta , 2012; Daudi, 2000 & Nagra 2010). Since 1992 the environmental education is appreciated by the Government of Pakistan and efforts are being carried out, therefore, ministry of environment in the year 1992 implemented a project under title" Coordinated Environmental Education Project". As a consequence of this project "introduction of environmental education materials in schools" as a key component of National Environmental Action Plan Support Program (NEAP-SP) – an umbrella program which is being implemented with the assistance of United Nations Development Program (UNDP) and donor agencies to support realization of Government of Pakistan's National Environmental Action Plan (Ministry of Environment, 2001).

As stated by Farooqi, from year 2004 to year 2009 , ministry of education Pakistan has implemented a project environmental education promotion funded by Swiss Development Cooperation (SDC) (Farooqui & Fatimah , 2010). However, with the onset of 21st century, an increasing trend of introducing the graduate and undergraduate degrees of environmental education and Awareness in Pakistan is recent and has still to mature. Therefore, the present research, as a part of environmental literacy project of Curtin University Australia, was carried out and it focused on exploring the attitude, behavior and responsibility of trainee teachers to the environmental literacy in public sector university of Pakistan.

Review of Related Literature:

It is commonly known that environmental literacy is reflected by the responsible environmental behavior of the individuals (Pe'e,Goldman & Yeltez, 2007; Roth, 1992; Wilke, 1995) literature reports that environmental behavior is a learned action that can be developed among individuals likewise is environmental literacy(Fang, 2020).It is noted that, the literature of environmental education is ever grown and kept enriching itself through redefining, describing and discussing it and its various aspects in detail. The recent climate changes, across the globe bring the environmental literacy, a focus for research and development in teacher education as well as in environmental education (Dada, Eames & Calder, 2017).

A major purpose of education is to enable people and allow them to live a productive life so that they may function as responsible civic members of the society. Environment problems can never stop arising until nations must control human population growth, better managing the finite fuel sources, providing the adequate quantities and quality of food and water, sensibly consuming the food to balance the various life chains, conserving the forests, improving the atmosphere quality and preventing the further disappearance of variety of plant and animal species (Peters, 1981). There is always a need to educate the generation of human beings about their environment and then "quality environment" concerns and consciousness in their everyday lives. It is needed to continually and logically balance the interests and needs of nature and human populations whenever it is decided about the usage of earth and environment.

It is pertinent to mention that the ability of humans to make decisions and choices in a fashion that can permit a sustainable human society and it is entirely dependent upon the environmental literacy of each citizen. The degree, in this regard, achieved is mainly a function of education and civic development. Environmental literacy extends beyond aspects of scientific literacy; environmentally literate people have

aspects of economic literacy, geographic literacy and have or seek the environmental sensitivity, knowledge, skills, attitudes and values, personal investment and responsibility, and active involvement. Hungerford and Tomara (1977) suggested that the goal of environmental education is, "the development of environmentally literate citizens, i.e. a citizenry that is both competent to take action on critical environmental issues and willing to take that action." Environmental literacy is known to study in environmental education disciplines as knowledge strand, skills strand, affect strand and behavior strand. There is always a need to develop an attitude , understanding and responsibility of the masses towards their environment especially in developing countries like Pakistan, being in fourth or fifth place as most vulnerable country to climate change in few climate change measuring indexes.(Climate Change Performance Index (2017) as mentioned by Burk et.al(2017). Hence for the development of attitude, understanding and responsibility of masses needs an educational setup that may have trained teachers to teach and raise the sensitivity to climate change and literate individuals to their environment.

In Pakistan, there is an utmost need to raise awareness among masses about claimate change and its impacts. Though formally. Government has taken many steps and research forums are discussing its need but academia at varsities may also need to address this domain of literacy . it is assumed that the most important role may be played by the teacher preparation programs that can specifically focus on addressing current issues and trends in climate and environment context and integrate various activities to make preparation of teachers effective. Such strategies enable teacher trainees to get awareness and impart their knowledge when placed in schools and plan for classrooms.

Methodology

The present research is quantitative in nature. A Public sector university's trainee teachers participated in the research. Purposive sampling technique was used to select the sample size of size 151 respondents. The sample responded on a standardized environmental literacy survey. The survey was The environmental literacy survey was comprised four parts. It was developed and standardized by Koul (2019).. First part of the environmental literacy survey was about demographic information of the respondents. The second part of the questionnaire was about attitude of the respondents. Part three of the questionnaire measures the behavior of the respondents about environmental literacy and fourth part was about responsibility of the respondents to environment. Data Analysis was carried out by using SPSS 25.

Demographic Analysis

Table 1 *Demographic description of data*

Gender	Frequency	Percentage
Male	35	23.0
Female	113	74.3
No mention	3	2.0
Total	151	99.3
Age		
15-17	29	19.1
18-20	72	47.4
21-30	48	31.6
41-50	3	2.0
Total	152	100.0
Level of Schooling		
Secondary Schooling	68	44.7
Tertiary-University	83	54.6
Total	151	99.3

Table I represents the demographic information about respondents. A total of 15 respondents participated in the study i.e., (35)23% male, (113)74.3% females and 3(2%) didn't not mention their gender. Further table reflects that 29(19%) respondents belonged to age group 15-17 years, 72(47.4%) belongs to 18-20 years , 48(31.6%) belonged to 21-30 years of age and 3(2%) from 31-50 years of age group. It is also reflected from table 1 that 68(44.7%) of study respondents were secondary school qualified and 83(54.6%) were tertiary education qualified.

Descriptive Statistics

Table 2 *Attitude of Trainee Teachers towards Environmental Literacy*

Attitude	N	Mean	Std. Dev.
I care about climate change that caused environment problems	147	4.15	.90
poisonous gases from human waste (i.e., factories and vehicles , etc.) can damage the environment.	146	4.20	.87
depend on the earth's natural supplies (for example oxygen, water, coal).	141	4.11	1.33
if I saw someone throwing rubbish on the road or into the sea or river, I will become angry.	137	4.23	1.15
There are limited earth supplies , so I will look after these supplies (for example oxygen, water, coal).	132	4.11	1.11
Technology is not sufficient to solve all the environmental pollution problems.	128	3.62	1.23
I think the environmental pollution problems (such as smoke) in other countries will also affect where i live.	129	3.65	1.18
Drink bottles of polyethylene tere phthalate (PET1) affect the environment.	129	3.98	1.10
I know how I live can affect the environment	129	3.84	1.01
participation in activities that try to eliminate the global warming is my responsibility	128	3.66	1.11
environmental problems can be solved if try seriously	127	4.32	1.02

Table presents the mean score for attitude of trainee teachers. Results reflected that majority of trainee teachers show an agreement towards environmental literacy by showing that they care about environmental problems, problems caused by poisonous gases, knowing the importance of oxygen supply, getting angry on someone throwing rubbish, knowing supplies on earth are scarce, and willing to solve environmental problems with mean score 4.15,4.20,4.11,4.23,4.11 & 4.32 respectively. Similarly, they responded that they show slight agreement to technology cannot solve all problems, countries impact each other, bottled drinks impact environment, how of a living impact environment and responsibility to slow down global warming with a mean score of 3.62,3.65,3.98,3.84 & 3.66 respectively.

Table 3 *Behavior of Trainee Teachers towards Environmental Literacy*

Behavior	N	Mean	Std.Dev.

When I go out, I am willing to walk, cycle and take public transport (trains & buses	141	4.21	.94
I usually turn the thermostat of AC from 26 °C to 28 °C to save energy	137	3.82	1.16
Taking care of environment (including educational institute and society) and making changes to the environmental conditions is needed	132	3.83	1.14
I am curious about carbon reduction, climate change and other related information.	127	4.09	.98
to discuss environmental issues at school.	129	3.84	.94
To reduce the pollution produced by garbage collection truck I support the reduction in collection days	125	4.14	1.00
Classifying the different types of recyclable items.	128	3.98	1.00
Using multi-media, magazines and newspapers, or the web to obtain information about environmental issues is effective	122	3.86	1.01
Identifying environmental problems and finding solutions for them	126	4.02	1.17
Convincing my family members and friends to undertake actions for betterment of environment.	125	3.86	1.12
when I go out, I bring my own personal water bottle	126	4.01	1.09
Carrying reusable utensils (i.e., forks, spoons, etc.).	139	3.40	1.32
Sharing information on .environmental protection	135	3.60	1.25

The results represents that majority of trainee teachers responded to perceive their behavior as supportive of environmental literacy and they are willing to walk out and take public transport as it helps reduce the climate change. Similarly they responded that they can identify environmental problems and can solve them. Furthermore, trainee teachers responded to obtain information about reusable materials. Paradoxically trainee teachers with a mean score of 3.4 remain unsure about carrying reusable utensils like forks, spoons etc.

Table 4 *Responsibility of Trainee Teachers towards Environmental Literacy*

Responsibility	N	Mean	Std.Dev
improve the adjoining environment	131	3.71	1.21
to prevent environmental pollution incidents	129	4.19	1.02
to solve any environmental problems that I have caused.	128	4.27	.926
Provide better awareness on environmental protection.	128	4.23	.976

Results represented the response of the trainee teachers' behavior for environmental literacy. Table reflected that majority of trainee teachers responded to have responsibility to solve problems, to persuade people around them to have environmental protection awareness and to prevent environmental pollution incidents, similarly table reflected that trainee teachers show agreement to improve the surrounding environment.

Table 5 *Attitude, Behavior and Responsibility of trainee teachers towards environmental literacy*

Variables	N	Min.	Max.	Mean	Std. Deviation
Attitude	148	1.25	5.00	4.01	.65
Behavior	145	1.75	5.00	3.87	.68
Responsibility	134	2.25	5.00	4.10	.72

Results showed that the number of respondents to each variable, minimum, maximum, mean score and standard deviation of the data. The table presents that mean score for attitude and responsibility shows agreement of trainee teachers towards environmental literacy with a favoring mean score of 4.01, 4.10 and standard deviation .65 & .68 respectively. Results, further, represents that behavior of trainee teachers is also towards agreement for environmental literacy with a favoring mean score of 3.8 and standard deviation of .726

Table 6 *Correlation of Attitude, Behavior and Responsibility*

	Attitude	*Behavior*	*Responsibility*
Attitude		.50	.56
Behavior	.50		.70
Responsibility	.56	.70	

**. Correlation is not significant at the 0.01 level (2-tailed).

Table 6 presents that there is no significant relationship between attitude and behavior, responsibility (r=.50, r= .56, p>.01.) Results also reflected that there is no significant relationship between behavior and responsibility of the trainee teachers i.e., r=.709 where P>.01

Discussion:

The present study concluded that majority of trainee teachers have supportive attitude and behavior towards environment. The findings are inline with the study in which students' environmental behavior on the basis of behavioral categories were analysed in-depth to represent environmental commitment and its different levels (Goldman et al., 2006). In the results of that study, it was reported that the lower the score for behavior is for higher the commitment level. Paradoxically Dunlap and Van Liere (1978) conducted a study to explore the issue of incongruity between environmental behavior and environmental attitudes that was found against drawing overly optimistic conclusions in some earlier studies that suggests and proposed the commitment of the public for responsible environmental behavior. Hence, the findings of the study revealed that knowledge and attitudes have no correlations and same was observed between knowledge and behavior, This, in turn, is in line with this idea and exhibits that there is necessarily no association between the beginning students' environment-oriented attitudes and possession of greater knowledge about environment. it is also evident from the literature that secondary-level students' results obtained by Kuhlemeier et al. (1999) support the importance of environment-friendly behavior with environmental knowledge and there is positive strong association between environment friendly behavior with environment knowledge. From the meta-analysis by Hines et al. (1986/7), it also appears that knowledge is a prerequisite to action, and this knowledge must include action strategies.

Recommendations:

The findings of the study recommend that trainee teachers have knowledge about climate change and have environmental literacy but they are in need of a module to be taught in their classrooms to plan an

action strategy and communicate the importance of environmental literacy in classrooms. The study recommends a model module on environment literacy by teacher education department that may explicitly enable the trainee teachers to get them aware about environment literacy and climate change.

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