

AN INTERPRETATIVE STUDY OF TEACHERS' PERCEPTIONS REGARDING THEIR ROLE IN ATTAINING A SUSTAINABLE ENVIRONMENT THROUGH ENVIRONMENTAL EDUCATION

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Abstract

Environmental sustainability has become a key consideration in today's era and needs sincere actions towards its attainment. This study is conducted to apprehend this concern and addresses the necessity of adopting respective strategies to mitigate vastly deteriorating environment. Having considered this, it elucidates that inducting Environmental Education in the educational system is the chief element for this purpose. Therefore, through teachers' perceptions, the study stresses upon the crucial roles of educators because they deliver appropriate knowledge precisely. It also accentuates the prosperity and advancements a protected environment provides to every milieu of the environment. Therefore, there is a dire need of introducing environmental education in Pakistan as there is a gap of knowledge regarding this in Pakistan's secondary level educational system. For research conduction, a cross-sectional, qualitative approach is followed. The research sample is 150 teachers of secondary level (6 – 10) schools of North Karachi, selected through purposive sampling. Semi-structured, 4 interview questions are designed as research tool and the data is interpreted through Thematic Analysis. The analyzed data showed positive responses of respondents for the essentiality of educators' role and they expressed willingness to induct environmental education as an entirely separate course for the optimal providence of awareness.

Keywords: Sustainable Environment, Environmental Education, Secondary Level Schools, Teachers' Role, Prosperous Environment.

1. Introduction

Environmental sustainability promises the enrichment of all its elements and provides abundance of plantation that is very necessary for all organisms and their significance could not be denied. This sustainable environment directly influences people's virtues and values of everyday life conduct (Erhabor & Don, 2016). Environmental protection also binds the cleaning and sweeping of areas where people live, gardening, creating a healthy and hygienic atmosphere, reducing pollution by whatever means possible, adapting eco-friendly products, and changing lifestyles that are directly or indirectly affecting properties and structure of the natural environment. Through these efforts, the sustainability of a protected environment could be achieved, resulting in long-term benefits for all living organisms. A sustainable environment could be apprehended as a state that is probable in the accord of all living beings inclusive of present and upcoming generations and the acquirement of a pure environment, rich in unharmed natural resources and full of opportunities and ways to meet the needs of all (Shutaleva et al., 2020). Considering this, it emphasizes the protection of every aspect that comes under the bounds of the environment. Reading thoroughly the work of Anton and Shelton (2011) gives a common understanding of the environment as being geographical, ecological, and physiological areas that include all biotic and abiotic substances as well as something that designs and defines the cultural heritage alongside. As maintained by them, environmental sustainability must entail the law of nature that all earthly aspects should be considered to have individual importance and that damage to one element is damage to entire living. The term "Environmental Sustainability" is the entitlement of refraining all the biospheric surroundings and resources for betterment. It ensures the mitigation of constantly damaging environment and preserving it for existing and upcoming generations to provide them with favorable opportunities and a better environment. It preserves available natural resources in the accord of social and economic sustainment. Alongside, this sustainment permits anthropogenic activities while keeping the natural resources and surroundings from deteriorating. It creates a kind of harmony among all societal and ecological aspects whereby each gets to grow and develop unharmed (Morelli, 2011).

For a very long time humanity is affecting its surroundings in a wide array of forms: Air, Aquatic, and Terrestrial. However, the development of technology provided ample evolution in terms of socialization, industrialization, urbanization, agricultural and infrastructural forms, and whatnots, but it has also been

patched up with massive calamity. Several aspects inclusive of economy, society, legislation, and daily routes of norms are also being infected by this commotion, and reportedly; 9 million fatalities are caused yearly by airborne contaminants that is a prime concern for public health globally (Manisalidis et al., 2020). Moreover, According to the United States Environmental Protection Agency (2022), smog is a serious factor of environmental deterioration which is produced when nitrogen oxides and volatile organic compounds (VOC) react together under high temperatures or existence of some solar energy. This particular phenomenon is termed as Ground-Level Ozone. This ozone directly impacts respiratory system, including chest pain, coughing, and shortness of breath, throat irritation, and prolonged asthma. This VOC is used in several domestic materials like paints, varnishes, polishes, wax, disinfectants, cosmetics, air fresheners, and cleaning products. Looking at harmful effects of VOCs are varied encircling people of all ages from children to elders. In children, this could cause leukemia, in pregnant women it aggravates the probability of a child being born with neurological issues, retarded growth and developmental issues, and many other birth flaws and deficiencies (Bower, 2009). Another chief factor in the deterioration of the environment is the polluted air. This contaminated air has air toxins that are varying compounds of chemicals of all forms of matter in the atmosphere dominantly leading to potential diseases and a higher ratio of deaths. Several forms of fuel utilization and multiple synthetic products are also the major cause of air pollution. This diversion of pollutants also comprises Particulate Matter (PM). The PM was elucidated by the United States Environmental Protection Agency, these matters are composed of particles having 10 micrometer diameter size or even tiny at times that are produced by the interactions of different toxic chemicals scattered in the air. This procedure or formation of PM also creates smog in the air (Morabet, 2019; Manisalidis et al., 2020; & Zhao & Cai, 2021). Getting in contact with PM puts human life at risk. These matters could penetrate into the body using several paths like: the mouth, pulmonary contacts, breathing, or dispersing via multiple mediums as well. Intensive outcomes of these encircle a wide range of illnesses including carcinogens (Tulane University, 2021), hormonal disturbances, thyroidal disorders, immunity problems, ADHD/ADD, autism, chronic fatigue syndrome, cancer, mitochondrial rupture, cardiac, neurological, and skin diseases are recorded (Gahry, n.d.; & Morabet, 2019). These tiniest PM gets their way into human bodies through the lungs and join blood flow and eventually get transmitted to every single organ and part of the body majorly worsening the autonomous system (ANS) and could even become terribly fatal (Fuller, 2020). Additionally, reproductive and central nervous system (CNS) disorders and malfunctioning are also attributed. People with chronic respiratory diseases, asthma, pneumonia, and diabetes are dangerously a big target of these matters. Subsequently, constant interaction with PM is accountable for causing acute and chronic diseases (Manisalidis et al., 2020) and is subject to some great damages. Furthermore, industrial procedures contribute a great deal of environmental pollution because of their noxious effluents that intensify the damage towards a multitude of milieu like marine life, flora, and fauna which eventually reaches to humans in one way or another (Singh et al., 2017). Wastage from textile industries is rich in heavy metals, carbon-based pollutants, and poisonous colors. This waste product gets dispersed in water that influences several entities of aquatic sources. An exceeded amount of heavy metals in water declines water quality, affects the water surface, gets used for agriculture, and damages vegetation and soil systems. This contamination in water mixes up with groundwater, gets consumed by humans, and becomes a health hazard (Bharti et al., 2013).

Therefore, undoubtedly accepting the essentiality of environmental protection for all earthlings, it propels towards the probable resources regarding this act. Although, there is an array of methods and personnel to do so only if they realize it as their responsibility being creatures of this world and specifically civilians of their respective countries. Indeed, this part needs the most to be highlighted for people to understand that protecting the environment comes within their responsibilities. This point punches down the dominance of Education as it is an ultimate and comprehensive source for the spread and deliverance of knowledge. In educational institutions, where the main aims and goals are directed to teach and prepare students for their future professional lives, and the country's economic stability is targeted through them, and while they are being fostered to become good professionals and specialists – nurturing in them the guarding of their environment should also be considered just as important. Therefore, introducing Environmental Education (EE) in the educational system is very essential because Environmental Education entails patterns to secure natural habitats and informs about individuals' harming attitudes toward the environment (Ozden, 2008). It is utterly important that, to induct EE in the educational system contemplative approaches like curriculum development, teacher training, course designing, and literary and practical acts should carefully adopted for the wide spread of awareness. Formal and informal and all other available measures must be considered to ensure a promising knowledge deliverance in order to attain a protected environment for all the organisms that are existing in this era and all those of coming years (Filho & Granvik, 2020). EE ensures the credibility of teaching about pressing and altering situations of the environment and of being able to raise voices against atrocious practices. It enables people to speak up and spread the word regarding environmental sustainability and its substantiality for future generations (Misseyanni et al., 2020). EE acts as a paradigm of demonstrating holistic knowledge referring

environment and its several phenomena, resolutions, challenges, blights, deprivations, and coherent strategies for curbing the issues it is faced with. It also educates the most probable course of actions and habits to get acquainted with to favor the biosphere and its dwellers. By the notation of the North American Association, EE entails a student-oriented approach to nurturing sincerity towards their habitats. This helps them explore and discover nature and the blemishes of the environment and enhances their resorting and apprehensive attributes which provide a wide array of options to work within for the privilege of sustainability and preservation of all biospheric species. Additionally, it is the process of self-realization in humans towards their anti-environmental behaviors (Erhabor & Don, 2016).

1.1 Research Objectives

1. To enlighten teachers' perceptions regarding the role of teachers in acquiring a sustainable environment.
2. To determine teachers' perceptions regarding the induction of environmental education and environmental prosperity.

1.2 Research Questions

1. What are the perceptions of teachers regarding the effects of teachers' role in acquiring a sustainable environment?
2. What are the perceptions of teachers regarding the induction of environmental education and environmental prosperity?

2. Literature Review

2.1 Environmental Education for Environmental Sustainability

Environmental education is vastly and unanimously accepted as being the bridge to intrigue a large throng of learners into the matters of the ecosystem. Aptly spewed knowledge helps understanding and realizing negative behaviors and attitudes of people towards the environment that eventually stimulates them to encounter all these detrimental factors and aspire to bring about change through collective and individual efforts. Including EE in the educational system is a manifestation of sincerity and diligently fulfilling responsibility towards saving biospheric elements, resources, phenomena, and elevating biodiversity. It is an impulse to open thresholds to environmental research on various educational levels whether them being the early stages, higher levels, formal, informal, or any other educational form. UNESCO has also taken action in this regard and addresses the mission of bringing the sustainment of the environment in its SD (Sustainable Development) by 2030 goals emphasizing the undeniable essentiality of having environmental education in the educational programs (UNESCO, n.d.; & Vorhölter et al., 2025). Correspondingly, some other research administered taking the same legacy forward was found to address similar discourse. Expressing ahead, research posits that EE is crucial to be accompanied in the educational system to stabilize several sociological aspects like politics, economy, cultural rituals, environment, and then some (Boca & Saraçlı, 2019). EE explicates knowledge inclusive of every matter leading to the understanding of natural settings. It illuminates several environmental aspects that are ignored by humans while indulging in their inane daily norms harming the natural environment either consciously or sometimes unintentionally. Taking further a similar connotation, Erhabor and Don (2016) stated in their research referring to EE that it implicates information concerning potential environmental issues along with appropriate tackling strategies for its learners. In addition to that, it also configures a pedestal for assertive individuals having adequate environmental awareness to work up for reviving and sustaining the natural environment and for its sufficient consumption without damaging natural resources and also being provided for the coming generations. EE is immensely significant in the educational system right from the early academic levels up to the higher levels for the constant implication of relevant environmental knowledge and awareness to keep students always exposed to altering situations and facts regarding biospheres, biodiversity, environmental development, and as well as with the adversity faced by them. In this support, Erhabor and Don (2016), also favor the idea of implementing EE throughout academic levels as it helps generate perceptual thinking and acknowledges threats to the ecosystem among students. Furthermore, this collaboration speeds up the sustaining process of the environment and limits environmental problems. It is a great vessel to channelize all the essential and required knowledge and awareness through theoretical and practical efforts as EE adopts diverse pedagogies to provide contextual information ensuring optimal, progressive, favorable results (García-González et al., 2020). Yadav et al. (2022) and Lasino et al. (2023) have explicated in their research studies that EE should be prioritized and opted for spreading the knowledge among individuals because it restricts them from their unfavorable behaviors, attitudes, and habits for the environment that are basis of the environmental pollution. Moreover, EE teaches and conveys knowledge to individuals and communities regarding multiple

environmental phenomena and motivates them to restore and maintain a sustainable form of the environment and its natural resources.

2.2 Environmental Education and Educators' Role

Extremely worsening scenarios have made environmental education crucial and to depend on EE for sustainability, it is essential to display intact curricular structures eminent to supporting the procedure and inculcating available resources (Boca & Saraçlı, 2019) for which many researchers and scholars mentioned and stressed upon its importance and found that EE proposes several pedagogical steps for teachers to choose from such as classroom-learning, service-learning, exploratory learning, field trips, and experiential learning, having promising impacts and attracting students towards environmental awareness (Ma et al., 2020; & Suárez et al., 2023). The former way of teaching environmental education was solely based on the content-centered approach where it was considered efficient to provide its learner with all the required knowledge regarding environmental phenomena and its variety of issues. However, with time the evolution in the pedagogies of environmental education brought forward several novel teaching methodologies for the teachers to opt for, like exploratory and investigatory approaches offered to inculcate for the education purpose of the environmental facts as it provide direct interaction with the environment and its issues that also help learners to seek for the solutions (O'Donoghue & Russo, 2004). As mentioned by Kimaryo (2011), the teaching of EE must focus on a few governing factors that, the students must be provided with first-hand experiences in their learning sessions. Environmental educators should provide students the chance to connect with the natural environment to gain multiple experiences because this would aid in the building of numerous active and problem-solving abilities. This type of teaching method would provide students with many different interactions with the environment in its different phases which would help develop diverse knowledge and different skills respective to each environmental situation. Secondly, educators should teach EE in the natural surroundings while utilizing the environment as a source of knowledge to teach about it and through different tasks and live events for comprehensive knowledge building in learners. Teachers construct strong bonds of students with the natural environment through these pragmatic, project-based, and live-event knowledge impartment approaches and these pedagogies also provide an in-depth understanding of the biosphere and foster respective attitudes in students that are amiable towards nature. This nurtured behavior of individuals draws them closer to nature and they intentionally volunteer in the activities for environmental sustainability (Suárez et al., 2023). Subsequently, teachers have a significant role in imparting environmental knowledge to students for the development of a sustainable environment and they could facilitate students with more of the student-centered approach for EE (Lasino et al., 2023).

2.3 Environmental Prosperity

A sustained environment is crucial for the entire humanity as it gives a variety of benefits by supporting economic conditions, improvising infrastructural ideas, increasing tourism, strengthening biodiversity, enhancing aesthetic sense in people, and providing better chances of socializing. Urban green spots expand the accommodation for various city-related animals and birds that dwell among humans and add to the beauty of residential surroundings. Apart from fauna, many floral species could also be saved by planting them in local parks, along with the side roads, on rooftops, and even around the residential houses. This gives a great essence of aesthetics and plant-caring sense of people along with the security to multiple extinguishing rear species (United States Environmental Protection Agency, 2022).

EE persists in greening the areas and addresses planning urban infrastructure more plant-supported instead of using up all area for constructing buildings because plantation mitigates most of the pollution from the environment. Furthermore, EE inculcates an array of opt-able solutions crucial for attaining environmental sustainability which supports several entities. Choosing alternatives for vehicle fuels and reducing energy consumption mitigate excessive production of carbon dioxide, removal of polythene bags, utilizing recyclable waste materials for various manufacturing and productive purposes, and decreasing usage of wooden materials enormously curbs deforestation (Arora, 2018; & Jennings et al., 2021). EE constructs sufficient strategies for residential plantations and teaches that it is highly important to value every milieu of the environment including flora, fauna, and other lives, and develops moral aspects in communities to benefit societies ecologically and for the betterment of natural conditions that ultimately contribute to the escalation of biodiversity (Bottalico et al., 2016; Hoffmann & Muttarak, 2020; Traverso, 2020; Begum et al., 2022; Ruiz-Mallén, 2022; & Milupi et al., 2023). It provides opportunities for the conservation of forests and the restoration of wetlands to the communities that take part in environmental educational programs. EE studies construct that are harming environment and are linked with anthropogenic activities and further advances to layout plans to halt the situations from worsening and provide societal well-being. (Harrison 2023). Furthermore, urban green areas remove a wide array of detrimental environmental toxicity and filtrate ultraviolet rays and noise pollution that are severely targeting public health (Nowak et al., 2014; & Carrus et al., 2015).

EE brings communities close to sustainable development as a joint venture and proposes such plans that work for the well-being of societies through urban planting, these planted places bring people close to nature, improve the connectedness and unity among people belonging to different ethnicities, and this eventually aids in the socialization of adults and children. People are also encouraged to bring their children to these places as well and it greatly puts positive, creative, explorative, and interactive impacts on their personalities. Additionally, this connection with people helps in spreading knowledge and more communal efforts for environmental betterment. (Ruiz-Mallén, 2022; & Harrison, 2023). EE exudes an understanding of human culture intertwined with ecological culture and this nurtures the sense of prevention for the whole environment among students (Boca & Saraçlı, 2019; & Shutaleva et al., 2020). Further, nature's interaction promotes cultural diversity, understanding, tolerance, and respect towards people of different ethnicities (Kruize et al., 2019). EE targets the development of environmental values and nurtures an understanding that the sufficiency of the environment relates to the independency of social, political, and economic conditions that directly impacts society and community building. Hence, efficiently delivered knowledge results in collaborated efforts in building a green economy that provides great benefits to the mankind (English, 2015; & Wu et al., 2023).

That is why this research study is conducted for the acquirement of sustainability of a protected environment through environmental education from an early age, because young students are highly motivated and attentive towards constructive activities. They have strong and growing curiosity and exploring instincts at this age and utilizing this power and energy in the right way would help leading out impressive results and great assistance in acquiring a sustainable environment. Therefore, environmental education rules as a prime aspect for stimulating, educating, training, and developing appropriate attitudes of students to ensure environmental sustainability. So, in this connection, this study addresses the essentiality of EE schools' curriculum and looks into teachers' perceptions regarding their role in bringing the environmental sustainability through the induction of environmental education in the academic system of secondary level and their role in teaching environmental education. Their favorable perspectives and acceptance of the essentiality of introducing EE as a linkage for earning sustainability would play a key role in propelling the notion of this research. Furthermore, this study also determines the interconnectedness of EE with a sustainable environment to provide its beneficial impacts to humans and other living organisms and natural resources. Hence, this research would be a significant addition to the existing body of knowledge and would inflate the respective field progressively.

3. Methodology

3.1 Research Time Horizon: This research study is a cross-sectional study.

3.2 Research Approach and Design: This research follows inductive approach and the qualitative research design is used.

3.3 Research Sampling Technique: For the selection of sample, non-probability sampling technique is used and the respondents are selected through purposive sampling.

3.4 Sample and Sample Size: The sample of the research is teachers of secondary level (6 – 10) of 35 schools of North Karachi Town, Karachi, Pakistan. The sample size is 150 teachers.

3.5 Research Tool: The data is collected through 4 semi-structured interview questions.

3.6 Data Analysis: For the analysis of data thematic analysis is used to interpret the collected data as suggested by Braun and Clarke (2006).

3.7 Data Collection Procedure: The interviews were conducted through focused group interviews and the participants were grouped into 19 groups, where 17 groups had 8 participants and 2 groups had 7 participants. These interviews were conducted in 19 different sessions where each session focused one group.

4. Results

Thematic Analyses

4.1 Theme I: Significance of Teachers' Role

The respondents were enquired about the significance of teachers' roles in the endeavors of environmental sustainability. They responded that teachers would be preceding the teaching of EE, so it is crucial to evaluate their roles because poorly administered efforts would not yield satisfactory results. They also think that before inducting EE, teachers must be provided with training sessions and should be educated about different teaching pedagogies offered for this course for a sufficient deliverance of the knowledge. When asked to emphasize the importance of teachers' support for students to work for the attainment of

environmental sustainability, they responded that teachers' role in motivating and backing up students is crucial because students are still in their learning time and they always need approval and a little push towards anything new they intend to do. Teachers are considered spiritual parents, and their roles are to supervise and monitor their students and convince, motivate, and support them to do good deeds. One of the respondents said that teaching EE and encouraging students towards the conservation of the environment would also provide a great opportunity for teachers to learn about the environmental phenomena and act accordingly and work together with students to save the planet, because children learn from elders and try to imitate them, this way teachers would appear as role models being involved in the environment-preserving activities for their students to look up to.

4.2 Theme II: Auspicious Environmental Conditions

The respondents were asked to comment on how EE improves and signifies several aspects of the environment by integrating with a natural environment, how EE could bring stability to the economy and how it could become significant to other species of the environment that are co-existing with humans and what other benefits could environment get through the integration of EE with a sustained environment. The respondents then answered that EE could encourage teachers, students, and communities towards plantation and with time an ample amount of plants would reduce pollution and provide fresh atmospheric surroundings. They also perceived that the abundance of the plantation would also support urban biodiversity. Some respondents said that in-school plantation is also important because in summer it becomes hard to conduct classes because of extreme heat, in this case, if schools would have enough plants around the premises it would create a cooling effect inside the school. Some respondents said that, as EE encourages outdoor interactions it would also enhance students' socialization which is essential for moral and ethical training and strengthens unity among people. A few of the respondents mentioned that, if EE is inducted into the educational system it would motivate towards low energy consumption by switching off unnecessary lights and fans, uselessly wasting water, unnecessarily leaving stoves on, and other similar actions that have become so common among youngsters and this would prevent excess energy loss that would strengthen the economy. Furthermore, respondents said that if environmental knowledge is provided to the general public it would speed up the preservation of the environment by utilizing the efforts of more people and every individual would realize its responsibility towards sustaining the environment. It would also emphasize low fuel consumption which would stabilize the economic condition of the country. Moreover, this deliverance of environmental knowledge among the general public would also support increased plantation and people would plant around their localities that would require gardeners, and this way it would also reduce the unemployment ratio.

4.3 Discussion

The analyzed data of the research evidentially exposit immense favor of environmental education from teachers. It shows promising results in the acceptance of EE unanimously. The outcomes of the research also show that participants are concerned about the deteriorating environment and eagerly show interest in putting their share to protect it from completely getting destroyed. Participants courageously acknowledged that their certain actions would greatly alter the deprivation of the environment and accepted their role and accountability to work for its betterment. The study showed that participants are in the acceptance of all the benefits this entire world could get if the planet is made a secure and unpolluted place. They also stressed that protection of the environment requires collective effort and sustaining the environment could easily be assured if every person of the society realizes it as their responsibility and plays part in this. Teachers also perceive that EE provides versatility in terms of teaching methodologies and supports the usage of different teaching aids and materials, and incorporation of several pedagogical approaches for an appropriate educational session. These results strongly link with the discourse of O'Donoghue & Russo (2004), Boca & Saraçlı (2019), and Ma et al. (2020) that are positing that EE provides a wide range of teaching methodologies to choose between for a sufficient and effective teaching session. Regarding the benefits of having a sustained environment, respondents identified that it increases biodiversity, curbs pollution issues, and enhances entire outlook of the environment providing prosperous surroundings for living organisms to thrive.

5. Conclusion

Conduction of everyday life events involves various advancements, innovations, machinery, and many other such developments that evolved over time. All these evolutions and productions have promoted human lifestyles and made the world more civilized, but on the contrary, it has also exposed the ecosystem to great danger of destruction and degeneration. Therefore, this study is conducted to emphasize the importance of sustainable environment and appropriate awareness deliverance with the help of environmental education in students from an early age to mitigate their improper actions and activities

that add up in the environmental destruction. For this purpose, teachers' efforts and involvement could not be denied because their individual, volunteer, and collective roles pay a great fortune in bringing environmental issues into the light and in motivating students to play their parts as well. The results of the research expose a great favor of introducing EE in the educational system of secondary schools, mainly because it educates about various environmental phenomena, explains all those anthropogenic activities that are harming the environmental state, elucidates constructs for the eco-friendly system, provides actable strategies to curb the issue, and most importantly EE signifies the ways that students and teachers could act upon in preserving environment that would be beneficial for all while maintaining its actual flourishing nature forever. Looking ahead, this study recommends an active participation of schools' administration, students' parents, community involvement, and governmental support in the endeavor of sustaining the environment and promoting the induction of EE in school curriculum. Moreover, school authorities must plan out annual or biannual seminar programs where environmentalists should be invited to present environmental information. These professionals would also discuss and inform students, parents, and other people of the schools' respective vicinity about the current issues of the climatic catastrophes and globally altering scenarios.

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