



A STUDY OF PRO-ENVIRONMENTAL BEHAVIOR AS A COMPONENT OF NATURALISTIC INTELLIGENCE AMONGST IN-SERVICE SCHOOL TEACHERS

Education

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ABSTRACT

Pro-environmental behaviors (PEBs), defined by Kollmuss & Agyeman (2002: 240) as "behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world"

Pro-environmental behavior can be defined as all possible actions aimed at avoiding harm to and/or safeguarding the environment (Steg and Vlek, 2009), either performed in public (e.g., participation in environmental movements) or private domains (e.g., recycling; Hadler and Haller, 2011). Environmental issues, concerns and problems are constantly under the scanner of public review and rightly so.

What we see all around us; be it forest fires, deadly heat waves, flash floods or droughts is nothing but the consequences and impacts of all our anthropogenic activities.

In keeping with the Sustainable Development Goals, we must try to curb the damage to the environment, or perhaps even reverse some of our deleterious actions.

We must consciously cut down emissions, reduce footprint, be sensitive, and of course behave pro-environmentally.

Environmental problems could therefore be reduced if people acted more pro-environmentally. Many countries have already committed to take measures to reduce climate change, yet the efficiency of implementation and scale of these measures differs across countries. People's environmental considerations, such as biospheric values and environmental self-identity, are related to pro-environmental behavior.

KEYWORDS

Pro-Environmental Behavior, Naturalistic Intelligence, In-service teachers

INTRODUCTION

"It is our collective and individual responsibility to preserve and tend to the world in which we all live"

Dalai Lama

In-service school teachers in India and perhaps the world over are much hassled by virtue of their hectic schedules, deadlines to complete syllabi, school events and more.

Additionally, they are required to put in at least a few hours of professional development and ensure that they are suitably prepared for the changes and uncertainties of the system.

Hence, adding another element of ecological literacy may seem to be burdensome and tiring for them.

But in the light of our current scenario where our Earth is teetering on the brink and quick decisive actions are necessary to ensure that no further damage is done, we must quite emphatically ensure that teachers become ecologically literate.

Our future generation needs to be urged to live responsibly, consume judiciously and respect the balance of nature that we may irrevocably damage.

Thus pro-environmental behavior is an important component of learning and immersion for in-service school teachers.

Pro-Environmental Behavior (PEB), also known as green-, sustainable-, or environmentally-friendly (eco-friendly) behavior, is defined as behaviors in which individuals take protective actions toward the environment.

PEBs include responsibly engaging with outdoors or recycling household waste and recycling but also can be adaptive responses to the impact of climate change such as purchasing sustainable products (e.g., local food, green cleaning products), conserving water or energy, or changing travel modes (e.g., from driving to walking or cycling) to buying an electric vehicle or building an off-grid home.

Concept of Naturalistic Intelligence (NI): Gardner designates naturalistic intelligence as the human ability to discriminate among living things (plants, animals) as well as sensitivity to other features of the natural world (clouds, rock configurations).

This intelligence has to do with observing, understanding and organizing patterns in the natural environment. A naturalist is someone who shows expertise in the recognition and classification of plants and animals.

NI refers to those with a talent or desire to know about living things and nature. NI can be developed by using appropriate teaching methods and it deals with sensing patterns in and making connections to elements in nature. Using this same intelligence, children possessing enhanced levels of "nature smarts" may be very interested in human behaviors, or the behaviors, habits, or habitats of other species.

They may have a strong affinity to the outside world or to specific animals, and these interests often begin at an early age. Children possessing naturalistic intelligence may enjoy subjects, shows, and stories that deal with animals or natural phenomena, or they may show unusual interest in subjects like biology, zoology, botany, geology, meteorology, paleontology, or astronomy. Naturalistic Intelligence may manifest itself in various dimensions and have many components such as

- Pro-Environmental behavior
- Eco-Literacy
- Environmental Attitude
- Eco-sensitivity etc

Statement of the study

A study of the effect of the Learning Package on Pro-Environmental Behavior as a component of Naturalistic Intelligence amongst in-service school teachers

Review Of Related Researches

Studies Conducted In India

Joyce, M. and D'Souza, S. (2016) have conducted research on Pedagogical interventions for Sustainable Development which elucidates ways of educating students for sustainable development and the same has been illustrated with a specific example on climate change. The student teachers are considered to be the target group of the study, since they are the ones who are attempting to achieve the aim of sustainable development in the educational set up.

Dr. Rema Devi, K. and Pradeep, R. (2016) have conducted a research on Naturalistic Intelligence and awareness on sustainable development among tribal students at Secondary level and the study showed the relationship between naturalistic intelligence and awareness on sustainable development of rural students of secondary level wherein sustainable development aims at creating chains of mutual, social, economic and environmental benefits at local and global level.

RESEARCHES CONDUCTED ABROAD

Anne Sofie Elberg Nielsen, Henrik Sand, Pernille Sørensen,

Mikael Knutsson, Peter Martinsson, Emil Persson and Conny Wollbrant in their research (2016) entitled *Nudging and Pro-environmental behavior* say that using Nudges for environment action and as a means to enhance pro-environmental behavior has been very effective.

Nudging through changes in the physical environment seems to be especially suitable to influence behavior in relation to waste sorting, waste recycling and decrease in food waste. The literature review has not identified similar examples in energy consumption and energy efficiency.

The nudging cases and experiments that have been carried out in Nordic countries also show that nudging through changes in the physical environment are of particular focus in waste management, especially in targeting waste recycling and decrease of food waste.

The literature study has identified examples and experiments in Nordic countries where they used nudging in the form of changes in the physical environment.

Erharbor, N. and Don, J. (2016) have conducted a research on *Impact of Environmental education on the Knowledge and Attitude of students towards the environment* and the findings of the experimental study revealed that there is a high level of knowledge and positive attitude towards the environment among the students. Also, it was observed that the relationship between their knowledge and attitude towards the environment is negative, showing little or no relationship. Therefore, it was concluded that environmental literate students especially in tertiary institutions are being nurtured to foster Environmental Education (EE) in Nigeria. Thus, the researchers recommend that more needs to be done to promote and encourage EE at all levels in the country, especially by the government and its agency to ensure effective implementation.

Crawford, E, Luke N, Von Pelt, W. (2015) conducted a research on *Children as "solutionaries" - Environmental education as an opportunity to take action*. They state that students can very well become empowered as "solutionaries," or individuals who plan and implement action steps that lead to a sustainable future. Results from the curriculum pilot offer support for the importance of interdisciplinary environmental education in the elementary setting.

Sukarjita, W. Ardi Muhammad, R. Abdul, M. Supu, A. Dirawan, G.D. (2014) have conducted research on *The integration of Environmental Education in Science Materials by using MOTORIC Learning model*. MOTORIC consists of seven components which constitute the acronym namely: Motivation, Observation, Talking, Orientation, Reinforcement, Implementation and Confirmation. The results showed at 95% confidence level the integration of Environmental Education materials in science subject matter of junior high school through application of MOTORIC learning models effectively improved students' knowledge of the environment by 64.15% in large groups of students while 68.07% in small groups of students.

Bjarne Bruun Jensen in his research entitled *Knowledge, Action and Pro-environmental*

Behavior (2013) state that the concept of pro-environmental behavior appears to be too narrow to encompass and describe the perspectives in this environmental education project. A number of changes, for instance, were in fact direct environmental actions (e.g. reduced speed limits), which came about as a result of pupils taking direct environmental action (e.g. demonstrations against traffic conditions).

According to him, the concept of pro-environmental behavior—even when defined in action terms—exhibits several problematic aspects. These include: (1) marginalisation of indirect environmental action; (2) restriction of action and behavior to individuals; and (3) an assumption that today's complex environmental problems can be tackled through unambiguous means (through the notion of 'pro-environmental behavior').

This environmental education project illustrates that this theoretical framework is too narrow and out of tune with both the complexity of contemporary environmental problems and an educational tradition based on action and democracy; the aim of which is to educate students to become critical and active citizens.

P. Wesley Schultz and Florian G. Kaiser (2012) in their research paper entitled *Promoting Pro-Environmental Behavior* state that they have chosen to use the term "pro-environmental behavior." and while the term may be intuitively clear, the literature is replete with similar terms and emphases: conservation, sustainability, efficiency, environmental protection, and preservation. They further state that while defining the types of behaviors that are considered pro-environmental has proven quite difficult due to changing standards for what is pro-environmental, and behaviors that are considered pro-environmental today could potentially be considered environmentally harmful in the future.

Anja Kollmuss & Julian Agyeman (2010) in their research entitled, *Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior?* emphasize the use of many models to predict Pro-environmental behavior.

Models of altruism, empathy, and prosocial behavior are other frameworks for analyzing pro-environmental behavior.

They quote Borden and Francis (1978, as noted in Lehmann, 1999, p. 34) hypothesize that: 1. Persons with a strong selfish and competitive orientation are less likely to act ecologically;

2. People who have satisfied their personal needs are more likely to act ecologically because they have more resources (time, money, energy) to care about bigger, less personal social and pro-environmental issues.

Jan Krajhanzl, 2010, in his research entitled *Environmental and Pro-environmental Behavior* states that "Pro environmental behavior is such behavior which is generally (or according to knowledge of environmental science) judged in the context of the considered society as a protective way of environmental behavior or a tribute to the healthy environment"

He also states that "The human behavior to the environment is influenced by external factors (that means the environment of an individual) and internal factors (physical and mental aspects of an individual). Some factors influence wide social groups (ecological tax reform, areal introduction of sorting containers) while the others can have an impact only on a couple of individuals (natural poetry of a South Korean poet).

OBJECTIVES

The following are the Objectives of the present study:

1. To study the impact of the Learning Package on the Pro-Environmental Behavior as a component of naturalistic Intelligence of in-service teachers on the basis of gender
2. To study the impact of the Learning Package on the Pro-Environmental Behavior as a component of Naturalistic Intelligence of in-service teachers on the basis of age (Above 40 years of age and below 40 years of age)
3. To study the impact of the Learning Package on the Pro-Environmental Behavior as a component of Naturalistic Intelligence of in-service teachers on the basis of their educational level (Graduates and Postgraduates)
4. To study the impact of the Learning Package on the Pro-Environmental Behavior as a component of Naturalistic Intelligence of in-service teachers on the basis of the levels taught (Pre-primary, Primary, Secondary)

Null Hypotheses Of The Study

The following hypotheses were formulated for the present study:

1. After completing the Learning Package, there will be no significant difference in the eco-literacy scores of in-service teachers on the basis of gender
2. After completing the Learning Package, there will be no significant difference in the eco-literacy scores of in-service teachers on the basis of age
3. After completing the Learning Package, there will be no significant difference in the eco-literacy scores of in-service teachers on the basis of educational level
4. After completing the Learning Package, there will be no significant difference in the eco-literacy scores of in-service teachers on the basis of levels taught.

Operational Definitions For The Study

1. Pro- Environmental Behavior -It can be defined as a demonstration or aspect of environmental empathy that includes activities which have

been recommended to resolve problems in the natural environment (Van Liere and Dunlap-1981).

2. **Naturalistic Intelligence**-the human ability to discriminate among living things (plants, animals) as well as sensitivity to other features of the natural world (clouds, rock configurations).

3. **School**- For the purpose of this study, the school considered is an English medium school affiliated to the ICSE curriculum, where the medium of instruction is English only

4. **In-service teachers**- For the purpose of this research, in-service teachers refer to teachers teaching in English medium schools affiliated to the ICSE and CBSE boards in Mumbai and teaching in Pre-primary (ages 3 to 5), Primary (ages 6 to 10) and Secondary (ages 11 to 15) levels.

5. **Learning Package**- A compact plan of procedures to bring a desired standard or condition or behavior, by instruction and practice; to do or achieve something according to the plan.

6. **Pre-Primary**- The section of school that caters to the education of students from 3 to 6 years of age

7. **Primary**- The section of the school that caters to the education of students from approximately 6 to 10 years of age

8. **Secondary**- The section of the school that caters to the education of students from approximately 10 to 15 years of age.

For the purpose of this study the Learning Package would be developed for a duration of approximately 60 hours. The package would include both online and offline content and would be based on the ADDIE model.

SCOPE AND DELIMITATIONS OF THE STUDY

The present study was restricted to:

- In-service teachers teaching in English medium private schools
- In-service teachers teaching Pre-primary, Primary and Secondary sections
- In-service teachers having an educational qualification of Graduation and Post-graduation
- In-service teachers of 40 years and below and above 40 years of age
- The study does not cover the following aspects of teachers
- Teachers teaching in schools following other language mediums (Such as Hindi/Marathi)
- Teachers teaching in government schools or semi-government schools
- Schools in other parts of the city
- Teachers who are currently not in service
- Family backgrounds that may preclude certain concepts of eco-literacy
- Exposure to social media and news articles relating to the environment
- Challenges and outcomes as impacted by the Covid-19 pandemic

RESEARCH METHODOLOGY OF THE STUDY

For the present study a true experimental design was employed as follows:

Pre-test: Post-test True experimental design

The research design is composed of two randomly assigned groups i.e. Experimental and Control, which are pre-tested before the implementation of treatment on the experimental group. The results of the pre-testing if indicative of a high NI quotient, such sample members would be excluded from the research study.

In addition, while treatment is implemented on the Experimental group only, post-test observation is carried out on both the groups to assess the effect of manipulation.

SAMPLING

A Stratified random sampling method was employed to select 4 English medium private schools.

Care was taken to include the schools in the particular geographical area of Thane District and Navi Mumbai, so as to adhere to a particular demographic profile of parents and students.

Due to the restrictions imposed by the COVID-19 pandemic, the researcher used online and digital data collection methods like Google Forms, Online surveys etc.

Data was collected from approximately 250 teachers of the 4 selected schools.

TOOL FOR THE STUDY

For the purpose of this study the following research tool used was:

Measuring Pro-Environmental Behavior (2019)

Developed by Florian Lange and Siegfried Dewitte (2019)

TECHNIQUES FOR ANALYSING THE DATA

The researcher used mean, median, mode, standard deviation, skewness and kurtosis for the descriptive analysis of the data and t-test and one-way ANOVA for the inferential analysis of the data

FINDINGS OF THE STUDY

The findings of the study have been analysed under the criteria as specified below:

On The Basis Of Gender:



Figure 1.1

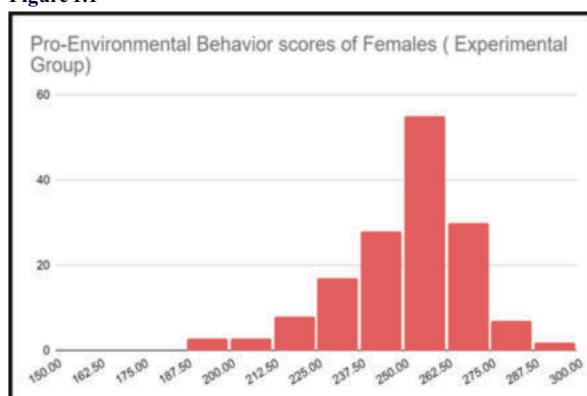


Figure 1.2

Table 1.1 Comparison Of Mean Scores And Standard Deviations

	Males	Females
Mean	240.666	250.738
Standard Deviation	26.892	18.017

Analysis Of Results On The Basis Of Gender

The Null Hypothesis (H_0) can be rejected at the significance level 0.05, because the p-value does not exceed 0.05.

Thus, we can conclude that there will be a significant difference in the Pro-Environmental Behavior of Males and Females thus leading us to the conclusion that Gender does play a role in Pro-Environmental Behavior.

Discussion On The Basis Of Gender

As seen from the results, we can conclude that Gender plays an important role in Pro-Environmental Behavior.

An explanation for this may lie in the fact that many domestic decisions that have environmental implications are usually taken by the women in the household.

For example, buying eco-friendly products, waste management and segregation and many such decisions are made by women.

As such women seem to exhibit much more pro-environmental

behaviors due to their innate tendencies of sensitivity, tolerance and understanding. Environmental psychology and environmentalism-based theories have mainly explored the role of certain personal variables such as attitudes, beliefs, norms, and values in explaining pro-environmental behavior. These theories have helped to show the significance of personal variables in predicting environmental concern and behavior. Some studies suggest that women tend to exhibit some types of pro-environmental behavior to a greater extent than men do.

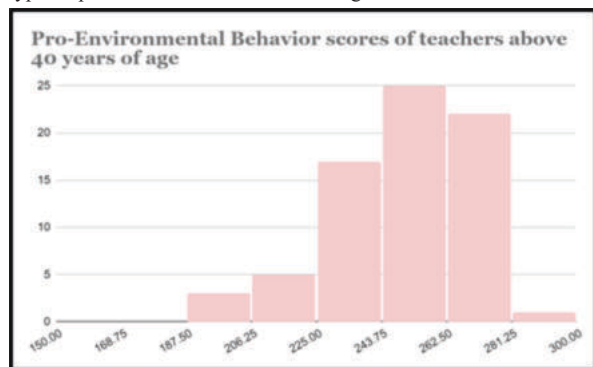


Figure 1.3

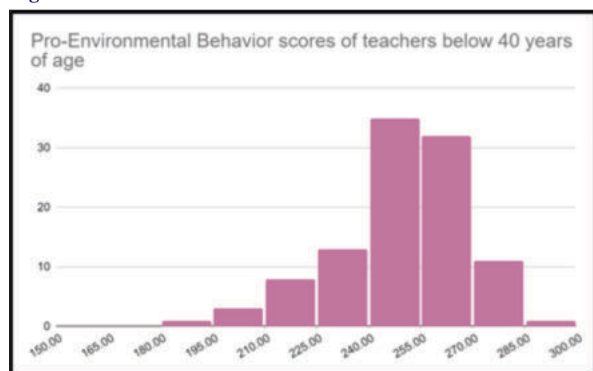


Figure 1.4

Table 1.2 Comparison Of Mean Scores And Standard Deviations

	Teachers above 40 years of age	Teachers below 40 years of age
Mean	249.657	249.346
Standard Deviation	20.984	18.500

Analysis Of Results On The Basis Of Age

The Null Hypothesis (H_0) can be rejected at the significance level 0.05, because the p-value does not exceed 0.05.

Thus, we can conclude that there is a significant difference in the Pro-Environmental Behavior of Teachers above 40 years of age and below 40 years of age, thus leading us to the conclusion that Age does play a role in acquiring knowledge, skills and attitudes for Pro-Environmental Behavior.

Yan Wang 1, Feng Hao 2 and Yunxia Liu 3, in their research entitled *Pro-Environmental Behavior in an Aging World: Evidence from 31 Countries* say that On average, age is positively associated with pro-environmental behavior. Older people are more likely to participate in pro-environmental behavior. More specifically, a ten-year increase in age is associated with a 0.52-point increase in pro-environmental behavior on a 4-point scale ($p < 0.001$).

This research is in conformity with the results obtained by the researcher too.

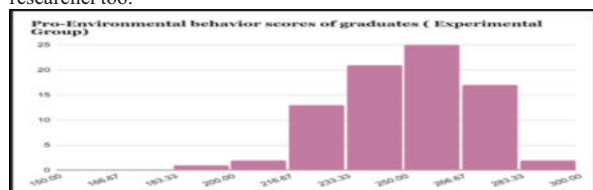


Figure 1.5

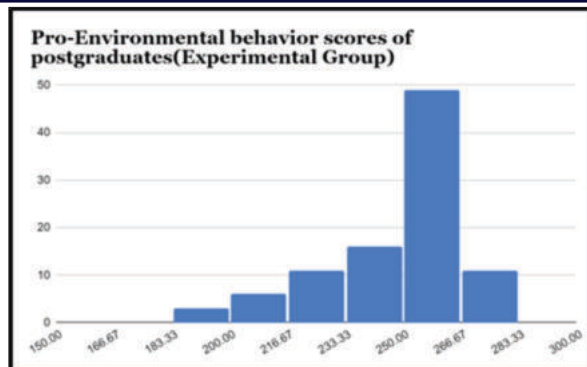


Figure 1.6

Table 1.3 Comparison Of Mean Scores And Standard Deviations

	Graduates	Postgraduates
Mean	251.024	248.020
Standard Deviation	19.438	19.868

As seen in Table 1.3, The mean scores of Graduates and Postgraduates are different ;

Mean (Graduates) > Mean (Postgraduates)

and the calculated p-value indicates that the degree of significance is high; hence

The Null Hypothesis is accepted.

Thus, we can conclude that there will be no significant difference between the PEB scores of graduate and post-graduate teachers, thus we can infer that educational attainment or level is not a factor for consideration for Pro-Environmental behavior.

Discussion on the basis of Educational Background / Educational Attainment

In the analysis of these results, we can infer that a formal graduation or post-graduation degree is not mandatory for a person to exhibit pro-environmental behavior.

Perhaps, what is needed is a sensitivity, certain practiced or learned behaviors and some innate consciousness to act in the interest of the environment and Nature.

In fact, the greater the level of education, this may cause the person to go further and further away from the environment and also perhaps to indulge in certain activities that may harm the environment too.

In the Indian context, since there is no course or unit based on environmental education that is covered during the graduation or post-graduation course; the graduate and post graduate teachers have no background of such inputs during their course and as such are self-driven or motivated to practice such green behaviors.



Figure 1.7

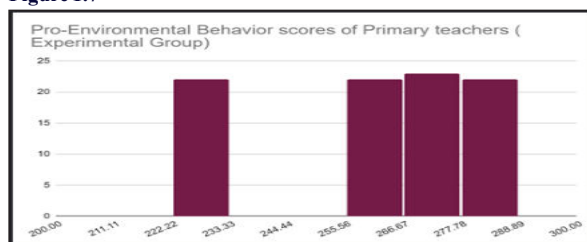


Figure 1.8

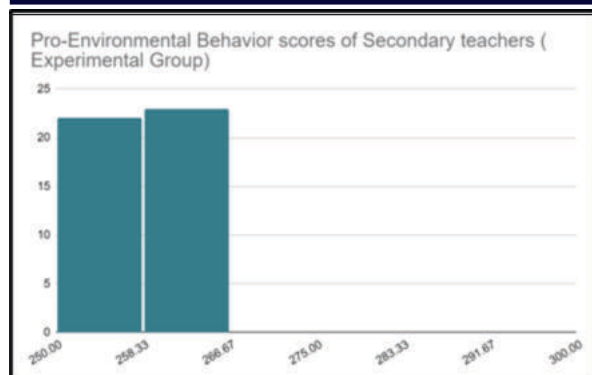


Figure 1.9

Table 1.4 Analysis Of Results On The Basis Of Level Taught

	Pre-Primary	Primary	Secondary
Mean	241.744	250.730	253.844
Standard Deviation	23.904	19.679	11.939

The Null Hypothesis (H_0) can be rejected at the significance level 0.05, because the p-value does not exceed 0.05.

Thus we can conclude that there will be a significant difference in the Pro-Environmental Behavior scores of pre-primary, primary and secondary teachers thus leading us to the conclusion that the level taught does play a role in Pro-Environmental Behavior.

Discussion On The Basis Of Levels Taught

As seen from the results of the research, Pre-Primary, Primary and Secondary teachers do differ in their Pro-Environmental Behavior component of Naturalistic Intelligence

As seen from Table 1.4, the mean scores of Secondary teachers are the highest indicating that perhaps the curriculum, resources and pedagogical inputs that are needed to teach the Secondary classes are in some ways also contributing to the pro-environmental behavior, skill and attitudes of the teachers. The subject matter for these grades may involve such inputs that help to develop these literacies.

Consequently, we find that pre-primary teachers may be limited in their exposure to such resources and unless they are personally committed to enhancing their own knowledge, as a whole the mean scores of these teachers is the minimum.

Primary teachers mean scores fall in between the above two groups, again indicating that their exposure to the content is more than the pre-primary teachers but less than the secondary teachers.

Conclusion Of The Study

On the basis of the findings the researcher arrived at the following conclusions:

On the basis of gender

Gender does play a role in the acquisition of knowledge, skills and attitude of Pro-Environmental Behavior component of Naturalistic Intelligence

On the basis of Age

Age does play a role in the acquisition of knowledge, skills and attitude of Pro-Environmental Behavior component of Naturalistic Intelligence

On the basis of educational attainment

Educational attainment does not play a role in the acquisition of knowledge, skills and attitude of Pro-Environmental behavior component of Naturalistic Intelligence

On the basis of levels taught

Pre-Primary, Primary and Secondary teachers differ in their Pro-Environmental Behavior component of Naturalistic Intelligence

Suggestions

The current research has implications for different stakeholders, as follows:

For school administrations:

They must realize that Pro-environmental Behavior is an important facet of school curricula school administrations must try to include and integrate it in various activities, aspects and events

For curriculum-framers

Curriculum framing and choosing pedagogical inputs to include in schools is a vital task and including concepts and elements of Pro-Environmental Behavior into school curriculum and textbooks would certainly give a huge impetus and ensure that future generations would be able live their lives responsibly and sustainably

For educators

As we move ahead to the next generation of learners, it is very important that educators must learn to master the concepts of Pro-Environmental behavior so that they may be able to nurture a new generation of citizens who would act sensitively and sustainably.

For policy-makers

This research has indicated that including the concepts, knowledge and skills of green and pro-environmental behaviors in school education would be extremely beneficial and could pave the way to ensure that we live responsibly and mitigate and manage some of the major environmental issues that abound all around us

CONCLUSION

As environmentalists, climate change experts, biodiversity experts all share vital statistics about the state of the environment and as we follow and work on the Sustainable Development Goals, humankind has to alter and modify behaviors such that we think of our environment first.

Thus, cultivating pro-environmental behavior and having an eco-sensitive attitude is critical and may well be the deciding factor for our survival on this planet.

Each day we see all around us more and more young icons and budding environmentalists like Greta Thunberg speaking up for the environment.

In such a scenario, it is vital and imperative that we train our young students to be alert and responsive to environmental concerns and behave appropriately in favor of our Planet.

After all, there is no Plan(et) B!!