



## Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices

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### Abstract

Worldwide Ambient Air Pollution (AAP) has been identified as a major hazard to all living beings covering the entire gamut from cities enveloped in smog to non-discernible polluted air inside homes and that are known to bring a negative influence on health and climate. World Health Organization (WHO) in its global report of 2019 attributed 7 million deaths to Air Pollution, both household (HAP) and AAP. In the scathing report while 3.8 million deaths were ascribed to inefficient fuel burning and dirty cook stoves (indoor exposure within households) the other half amounting to 4.2 million deaths was recognized to be directly influenced by exposure to AAP (outdoor). WHO's report also indicated that close to 91% of the world's total population resided in places where air quality exceeded its prescribed safe limits. It is interesting to note that large populations and high AAP was mainly concentrated in third world countries which had the misfortune to shoulder the burden of disease. As a major player amongst third world countries India has seen pollution from all sources growing by leaps and bounds while accounting for more than a quarter of global deaths. India's rising pollution levels gets multiplied manifold since it is burdened with a large and ageing population. As per data released in 2018 by IQ Air, Air Visual and Greenpeace, India has the singular dishonor of having seven of the 10 most polluted cities in the world with Gurugram being the worst affected. Over 4 million Indians are also known to succumb prematurely to cardiovascular diseases, respiratory ailments and diabetes (as of 2016) with the sad observation that most of these occur amongst the 30–70 year old population. Unbridled rise in population has led to unplanned urbanization and industrialization which in turn have adversely affected the qualities of breathable air, potable water and resulted in contamination of food. For mitigation of the same and to alleviate related adverse health effects, there is an immediate need for targeted action. Since the chasm of environmental pollution is exceedingly large between developing and developed countries so any focused action to bridge the same needs to address the problem at the grass-root level. In view of this a need is felt to gauge the level of environmental education amongst children - the citizens of tomorrow. In the current investigation a survey on Environmental Awareness amongst the students pursuing primary, secondary and undergraduate levels of study respectively was carried out addressing basic issues associated with environment - awareness, conservation and sustainability. Today, when our future relies on sustainability; large majority of respondents were completely unaware of the term and could not relate to this concept with environment. Thus, it has become a need of the hour to start stressing on Environmental Education more than ever before and make it a crucial part of our curriculums at both schools and colleges.

**Keywords:** Environmental Education, awareness, sustainability, mitigation.

### Introduction

Change is the nature of the climate and it has changed numerous times since the formation of the earth. However, it is important to realize that all these climatic changes have occurred gradually over large periods of time (typically thousands of years).

Negative influence on the climate has only been accelerated in the last few centuries due to extensive anthropogenic activities. Increasing global temperature, melting glaciers, forest fires, increase in incidences of natural calamities, scrambling wildlife to sustain its survival-all have made it requisite for the humans to understand the gravity of the situation and act accordingly. Conservation stands synonymous with survival today.

However, humans are still not ready to understand that they aren't different from the environment, rather a part of it. This in itself portrays how unaware we are, regarding our own environment. Aware and proactive citizens have the power to make informed decisions and play a vital role in environment conservation in the years to come.

In the last decade or so many studies/surveys on environmental awareness have been carried out amongst different classes with varying demography in India and elsewhere<sup>1-3</sup>. Specifically in a survey conducted by Thacker and Anthony<sup>4</sup>, 41% of Indians (surprisingly) answered negatively about existence or occurrence of the phenomenon of global warming. Mridula Ramesh has also quoted in her book on "The Climate Solution" that one in four Indians is ignorant about global warming<sup>5</sup>.

Awareness can be understood to be a tool that leads to prevention, saves us from destruction. However, looking at the trend of unawareness as available literature indicates, an urgent and acute need for environmental sensitization is strongly envisaged. Stevenson et al. propounded education of the societies as the most effective way to solve environmental problems<sup>6</sup>. It is therefore conjectured that wholesome education (including environment) that is ably supported with active public participation can only bring about an affirmative change and enhance quality of the environment.

A more recent field of study that deals directly with anthropogenic interaction with their immediate bio-physical environment and gauge the amount of this interaction is popularly referred to as Environmental Education and Awareness (EEA). EEA can be understood to delve into aspects that are concerned with anthropogenic behaviour directly linked to their interaction with bio-physical environment besides being focused towards their ability to understand this interaction. EEA therefore can be seen to further UNESCO's vision of environmental protection besides alleviating societal problems, thus affecting quality of life. Zhou et al. in their study<sup>7</sup> have discussed this aspect of EEA as positively influencing entire repertoire of knowledge of any learner be it cognitive, affective and/or participatory in nature.

Study of environmental education and awareness assumes importance especially at the initial level since it has a direct positive influence in making individuals and communities look at nature from a different and separate perspective of natural and built environments.

EEA is envisaged to have maximum impact in instilling a sense of responsibility to protect and developing an attitude for environmental conservation, involving citizens of all strata as active stakeholders and solidarity amongst countries.

EEA is envisioned to ignite young brains to propound the idea of symbiotic coexistence along with pacification of routine conflicts through progressive acquisition of new ideas of social relation and survival guidelines<sup>8</sup>. In the light of this thought, a need for a survey on EEA amongst the students (n=340) pursuing various levels of study including primary, secondary and undergraduate was envisioned. The study assumes importance since the survey systematically documents answers from students from different backgrounds having varying levels of maturity for the same set of questions.

## Methodology

The method used was Survey Research method. It's one of the most integral areas of measurement in applied social research.

The survey was conducted amongst primary, secondary and undergraduate students comprising of a sample size of 340 students. A separate set of 10 questions each was prepared for

each category according to their academic levels. The primary and secondary level survey was conducted at: i. MCD Corporation School, Naraina, H-Block (Delhi), ii. MCD Corporation School, Naraina, G-Block (Delhi), iii. N.C. Jindal Public School (Delhi), iv. St. Mary's School (Delhi), v. Navyug, Sarojini Nagar (Delhi), vi. Captain Amit Verma Senior Secondary School (Delhi) with their due permission and allowance.

The undergraduate students' responses were gathered through an online survey (Google forms) from various students of University of Delhi.

## Results and discussion

Though EEA has been a part of our curriculum for many years now, still it doesn't seem to have made the impact it was supposed to the results obtained from the survey, reflect the same.

The survey for primary level was conducted amongst 180 students from different schools comprising of 10 questions. A general trend of lack of awareness can be observed from the graphs depicted below. The survey for secondary level was conducted with a sample size of 100 students and comprised of the same set of 10 questions. The survey for undergraduates was conducted amongst 57 students. A major lack of awareness can be observed in the graphs shown below. The actual results obtained from this age group, show stark digression from the expected results.

The questions of the survey consisted of the following details: Q.1: What do you understand by environment? Q2: Is environment important for you to survive. Justify. Q3: Have you heard about any environmental problem recently? Q4: Do you think you're contributing to that problem? Q5: Justify above answer. Q6: What are blue and green bins for? (Followed by question of segregating waste from garbage bag) Q7: Why do you think we need to segregate waste? Q8: How many types of pollution are you aware of? Q9: Why do you think trees are important to us? Q10: How is plastic harmful?

Figure-1 shows the plot of environmental knowledge depth of primary school students vis-à-vis questions related to environmental awareness put to them during the course of the survey. It is noted that most of the students at this level are unable (58%) to understand as to what constitutes environment and about 24% are only partially aware. Moving on, it is observed that almost equal percentages of students are aware (42%) and unaware (44%) about any recent environmental problem. This indicates that it is actually general knowledge driving the cognitive levels of understanding rather than education in the classroom through focused learning outcomes. It is also sad to note that the current levels of understanding about contribution to environmental degradation, is almost negligible as a staggering 63% of students said they were

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unaware of their contribution. This result simply indicates that there is a basic fallacy in the way that the education is being imparted with stress on rote learning and respect for all things related to nature is conspicuous by its absence. The same problem gets compounded as the next two answers indicate that majority of students are unaware about the concept of waste segregation (77%) and presence of blue/green bins for waste disposal (80%). Faced with so much unawareness about pressing problems in real-life gives a ray of hope whence almost 52% of students recognize existence of pollutants and pollution.

At the same time huge unawareness (68%) about plastic permeating through every inch of our lives leaves us to ponder our priority of topics in education. The situation becomes gloomier when students are not able to answer queries based on significance of – promotion of solar panels, basic connotation of carbon footprint and need for sustainability by leaving answer columns blank in the survey. The situation of overpowering prevalence of unawareness amongst young students indicates the deeper malaise afflicting the Indian education system wherein although all the aforementioned topics are used ad-nauseum for submitting ‘projects/write-ups/debates’, are yet to be included in the bulwark of education for understanding like in Scandinavian countries.

Figure-2 shows the plot of answers provided by secondary level students of schools subject to the survey gauging their understanding of environmental awareness. Compared to answers received from primary level students, it’s noted that an enhanced level of maturity definitely influences the outlook of

the students towards environmental awareness in a positive manner. Specifically, the consciousness about environment responses of secondary grade students could be discernibly seen to shift from unawareness to partial awareness although percentage of complete awareness is seen to remain almost the same at 17%.

While a substantial enhancement (69%) in awareness about existence of environmental problems is clearly perceptible, secondary grade students (52%) also exhibit sound knowledge about contribution by anthropogenic sources when compared to responses by primary students (18%). Further, obtained responses indicate that secondary students are either aware of or unaware about existence of blue/green bins although why segregation of waste at the source is necessary is not clear to them (55%) as also whether it happens or not. It is surprising to note that compared to primary level students (52%), awareness levels about existence of pollution and the pollutants is actually seen to decrease to 12% amongst secondary level students. This shocking result, paradoxically with increase in maturity levels, may be attributed to beginning of rote learning amongst students with an eye on scoring higher marks in board examinations which incidentally are held at the end of terms without inclusion of continuous evaluation component. In the case of pollution being caused by plastics, a small but definite rise in awareness levels is noticeable. Other plotted answers relating to promotion of solar panels, definition of carbon footprint and need for sustainability show a miniscule level of rising awareness amongst secondary level students, over the primary ones.

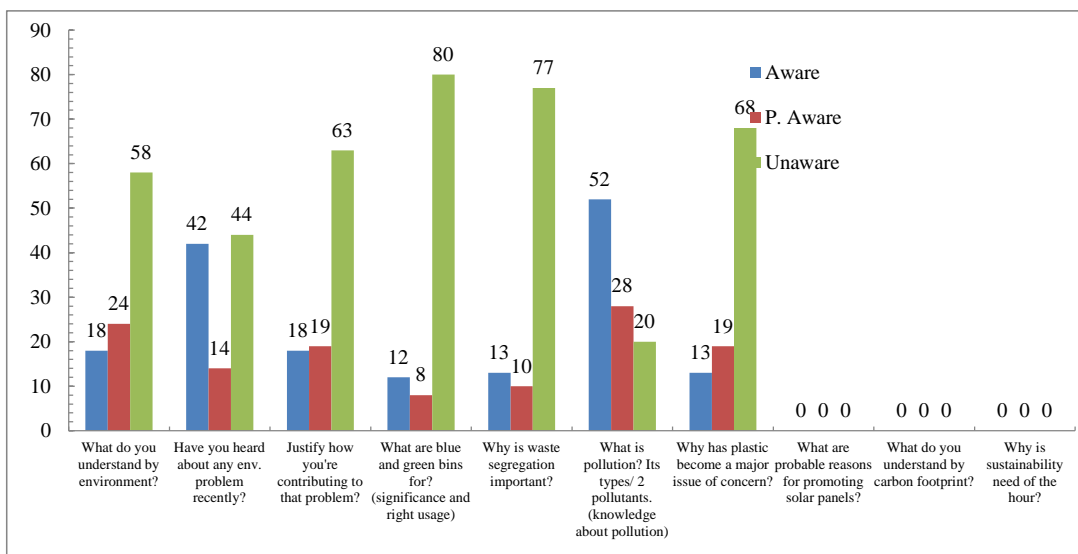


Figure-1: Plot of environmental knowledge depth of primary school student’s vis-à-vis questions related to environmental awareness put to them during the course of the survey.

Figure-3 shows the plot of collation of answers to the survey as provided by undergraduate students pursuing college level of education from different streams including sciences, humanities and commerce. The survey results begin on a very astonishing scale wherein it is noted that despite very high level of maturity

and almost 14+ years of education, undergraduate students' exhibit unnaturally high (77%) disregard towards environment. Hence, the positive response noted with increasing maturity amongst students moving from primary to secondary level is completely negated and replaced with despondency.

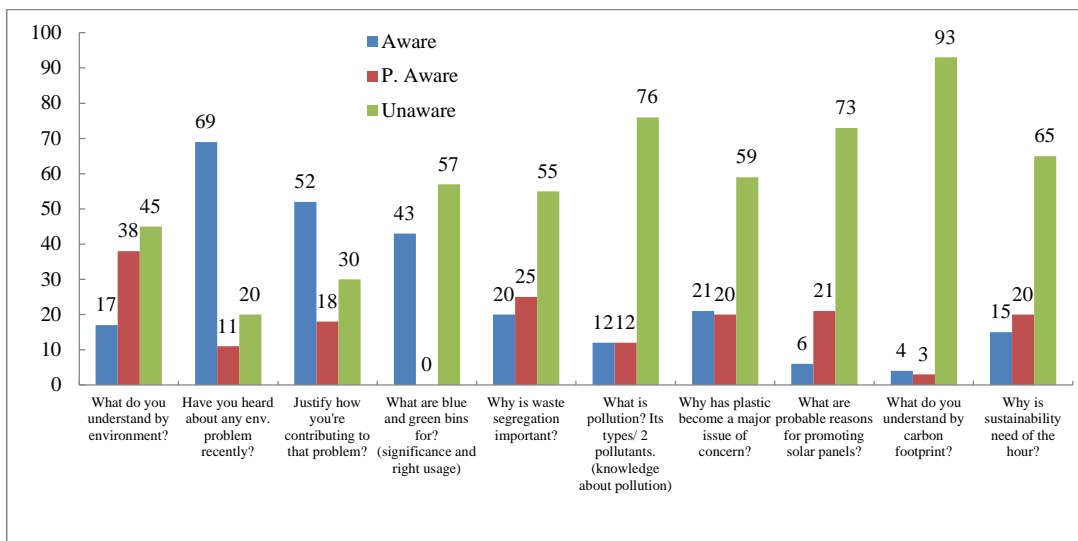


Figure-2: Plot of answers provided by secondary level students of schools subject to the survey gauging their understanding of environmental awareness.

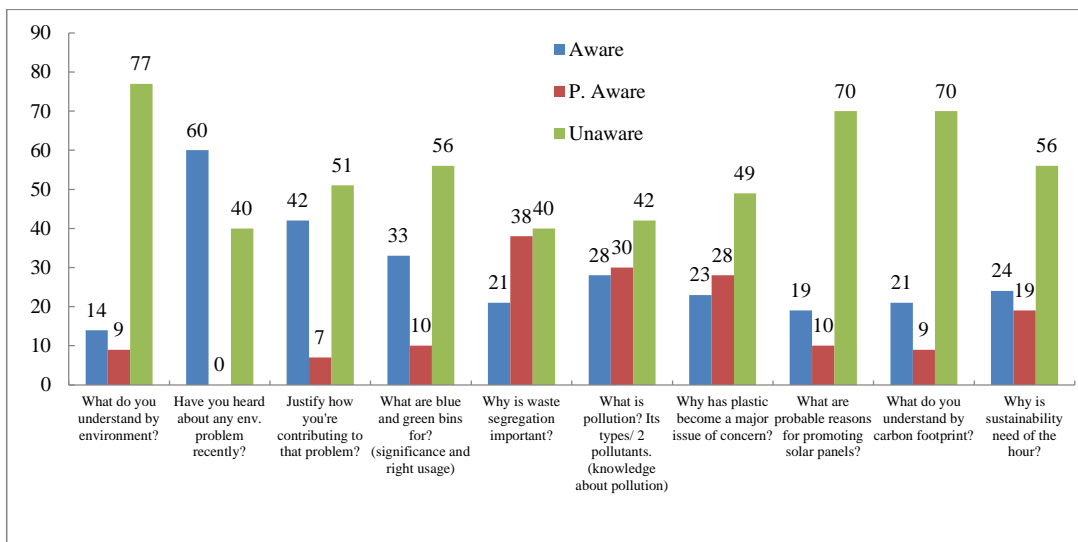


Figure-3: Plot of collation of answers to the survey as provided by undergraduate students pursuing college level of education from different streams including sciences, humanities and commerce.

This disdain for environment can perhaps be attributed to the concept of environmental awareness not ingrained in the systems of undergraduate students as part of their initial years of study. Skewed understanding of environment or utter neglect of the same simply indicates that whatever teaching-learning methodology undergraduates have been subjected to, promoted rote learning for cracking examination questions rather than education in the real sense.

The literacy milestones achieved and reported in official figures can thus be understood to achieve ambitious 'envisaged' targets and garner future funding in the education sector. Moving on the data indicates partial awareness to be minimal or absent amongst undergraduate students for recent environmental problems and existence of anthropogenic causes. Although complete awareness continues to be at an average of 30% yet ideas about waste segregation at source, use of blue/green bins, existence of pollutants and identification of plastic as a major pollutant can be observed to be taking shape. Unawareness levels continue to be high for promotion of solar panels, whereas idea of carbon footprint is still vague. However, semblance of their basic concepts can be seen to be taking shape. Though idea about sustainability (24%) can be seen to be gaining momentum (positive development) still environmental

awareness needs to take shape at much earlier age for a paradigm shift in knowledge levels to occur.

Plotted data in Figure-4 indicates that awareness about renewable energy sources, carbon footprint and sustainability is zero at primary and negligible at Secondary and UG level. Awareness about waste segregation and the usage of blue and green bins is also very low at primary (13%) level but a little more at secondary (20%) and UG level (21%). Though the students of secondary and UG level can relate to the usage of green and blue bins for biodegradable and non-biodegradable waste but how and why they affect our environment is not clearly instilled in them.

It was heartening to learn that more than 50% of primary school children know about pollution and causes of pollution. That's because pollution studies are a part of their curriculum. Unfortunately, the secondary and the UG students who are expected to know all about pollution and its mitigation do not have a sound idea about the different factors contributing to pollution. To curb the levels of pollution and to find ways of mitigation is not their duty. The situation can be attributed to the fact that after primary standard, studies on environment are either self-taught or at best superfluous to their main course of study.

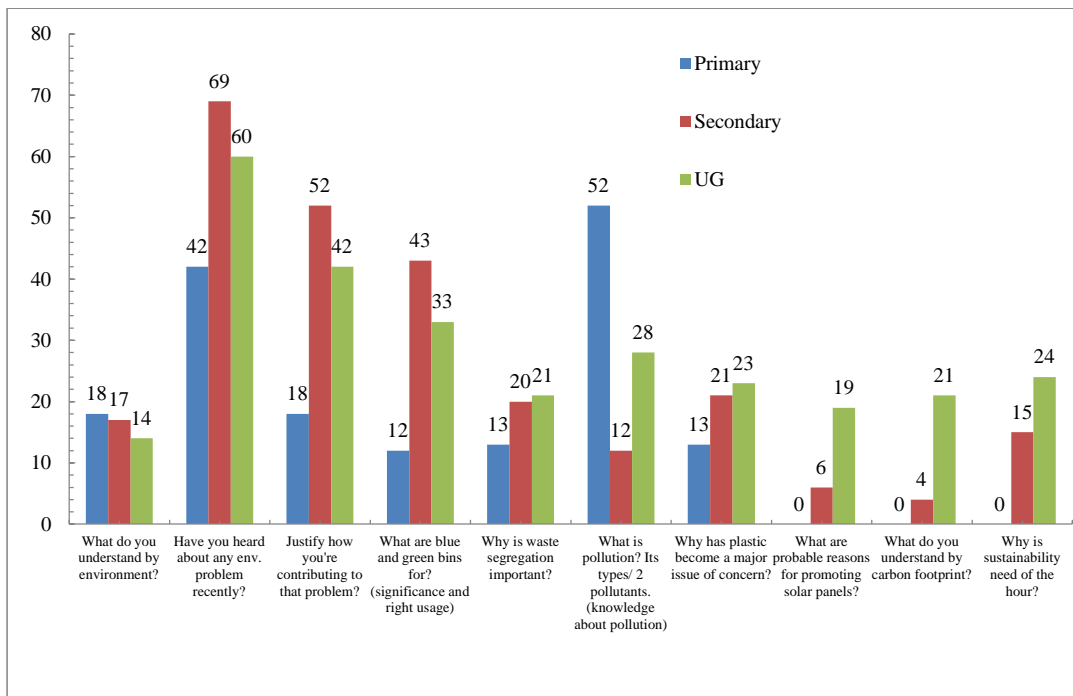


Figure-4: Plot of awareness level data for primary, secondary school and undergraduate college students.

Reports worldwide indicate the mammoth pollution being caused by plastic/polymers including cases of animals ingesting plastic bags, choking of wet lands and water bodies because of water bottles, wrappers, carry bags etc. However, measured responses in the survey indicate that awareness about the magnanimity of the issue amongst almost all students at the three levels of study is at best dismal (13, 21 and 23%). They seem to be oblivious to the fact that plastic pollution is forever as the average life span of plastics/polymers is around 5000 years.

In India, students at all levels are taught Environmental studies as a part of curriculum. Sadly enough, all knowledge remains confined to the class rooms and test papers (rote learning) as there is no connection between theory and practice. Practice of being one with surroundings and understanding environment is at best non-existent as is teaching functioning of ecosystems and how sustainability is dependent on a balanced ecosystem. The students at all levels know (mainly from media reports, social networking sites etc.) about the environment being polluted but they have no idea how they are contributing to this pollution and can't think of ways and means of mitigation.

**Discussion:** As envisaged advanced issues like need for promotion of the use of solar energy, significance of carbon footprint and need for sustainable practices could not be answered / understood by students at primary level, however it is surprising to see secondary students answering more proactively compared to undergraduates with more maturity. This leads one to infer that more than maturity in age it is dedication towards the cause that governs one's action. In this particular case the so called 'dedication' has been academic pressure by means of marking scheme in examinations. It is this attitude that necessitates a requirement of paradigm-shift in its focus towards education related to environmental awareness. Getting environmental awareness to be the bulwark of one's education right from inception of studies is need of the hour.

At the Earth summit held in Rio de Janeiro, Brazil in 1992 discussions on underlying role of society as an ingrained part of the environment led to coining of a new term - socio-environmental. Post conjugation of social responsibilities with environment at the Earth Summit, scientists worldwide got actively engaged in researching environmental education and sustainable development together. Sustainable development became a prominent concept after Brundtland gave the term in 1987 stating it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"<sup>9</sup>. Sustainable development was understood to encompass economic coupled with social development besides including protection of environment as per the mandate of The Earth Summit, 2002<sup>10</sup>. Role of education systems were redefined to embody facilitation, envisioning and working towards achieving the goal of sustainable development.

Mitigation of environmental problems has been explained to be possible through focused education of stakeholders of the society<sup>6,11</sup>. Worldwide alleviation of environment related problems have become individual and social necessity and education about environment has become one subject that demands unwavering focus.

According to Carvalho, all education in EEA related teaching-learning processes ought to incorporate an environmental angle. A paradigm shift allowing an interdisciplinary approach into investigation of environmental issues through mobilization and incorporation of multiple disciplines in varying degrees<sup>12</sup>.

EEA professes harmony between humans and environment and which is understood to be possible whence humans pursue anthropogenic activities that are in synchronization with nature thus showing respect and a symbiotic interdependence<sup>13</sup>. Currently, EEA has taught in traditional class rooms, communities and natural habitats including museums, parks and zoos<sup>7</sup> encompass organized efforts but is fraught with limitations. It ought to be taught to include functioning of natural environments and how anthropogenic activities can complement it via sustainable management of ecosystems<sup>14</sup>.

Ertepinar et al. observed that elementary students did not have a responsible attitude towards environment and that their area of study was independent of relevant environmental issues<sup>15</sup>. Traits like sensitivity towards nature and its constituents could be attributed to the disconnect, between their classroom teaching and exposure to ecosystem, natural resources and nature. Severe lack of inclusive EEA in the curriculum could be easily discerned.

It is therefore deemed important that elementary education incorporate constituents of EEA at the very basic level in synchronization with those related to IT, effects of industrialization, resources of energy and their uses etc.<sup>16</sup>.

To solve the Environment crisis which the World is facing today, it is necessary to educate and train students to respect and care for the Environment through different activities and programmes if we want to solve the current environment crisis<sup>8</sup>.

It is unfortunate that teachers catering to elementary level do not have sufficient environment knowledge and time to propagate values identifiable with EEA<sup>16</sup>. Their knowledge is limited when it comes to discussing climate change, global warming, particulate pollutants, radioactive and nuclear waste, disposal of waste and contributions of motor vehicles to environment, to name a few. Contemporary times with each and everything available on the internet, young students with impressionable minds and thirst for knowledge are prone to miss out on physical exercise along with exploration of nature and learning about environment. Therefore, it is deemed necessary to inspire the children to proactively take up activities related to environment so as to foster a symbiotic and positive relationship with it<sup>17</sup>.

European country of Slovakia has taken a lead in implementation of EEA by way of including students' participation in scientific projects including those dedicated to the cause of environment<sup>17</sup>. The initiative stokes popular scientific interest amongst the young stakeholders while striving to improve perception and therefore bestowing an important status to values related to environment in the society. Special emphasis is laid on creating awareness amongst the younger generation to care and protect the environment.

Estrada-Vidal et al. in their work have espoused raising awareness levels amongst the local populace to preferentially consume local produce besides making use of local products. This initiative proffers twin advantages of not only boosting the local economy but also giving a fillip to citizens of all strata to appreciate their local environment. This idea of being vocal for local envisions enhancement of appreciation for nature besides creation of balance in consumption and preventing over exploitation of resources by pursuing the idea of fair-trade<sup>18</sup>.

Contemporary classroom-based education system leaves very little opportunity for students to get close to nature and understand its wonderful bounty. Even environmentally conscious students are unable to positively influence their peers due to their miniscule number and pre-conceived notions deeply ingrained in the minds of people.

There has therefore arisen an urgent need to re-educate people the functioning of natural environments and particularly re-invent anthropogenic behavior towards ecosystem such that it becomes sustainable and herein role of EEA assumes importance<sup>14</sup>. It is important instill in students' virtues of sustainable ecological development so as to motivate them to develop a healthy respect for nature<sup>13</sup>.

The field of sustainability education has currently matured into the new discipline of EEA that is being made to permeate all levels of society to boost up sustainability and therefore create conditions that are conducive to survival and coexistence for all living beings on earth despite anthropogenic incursions<sup>18</sup>.

Need for more suitable lifestyles with special correlation between EEA and knowledge has been shown, to promote sustainable consumption and therefore the burgeoning need to adopt eco-friendly lifestyles<sup>19</sup>.

Until and unless we realize that we are as much a part of this environment as it is of us, chances of our sustenance are bleak. It's not just a physical entity surrounding us; but the basis of our existence as well. This ideology needs to be planted in our kids right from kindergarten because it is as necessary as toilet training. There is no better way to implement this, than education. The importance of EEA can be gauged from the fact that it is easily considered as a must-learn attitude towards life covering the entire gamut of a human's life from kindergarten to being a senior citizen. EEA is envisioned to sustain

throughout one's life as it directly connects all citizens to unique experiences while making them responsible stakeholders of nature and developing a positive and enhanced interest into everyone's well-being<sup>17,20</sup>.

EEA in its truest sense can be viewed as being constituted of three life-based attitudes Lifestyle change, Lifelong education and Life changing initiative that influences and connects all changes happening around in microscopic and macroscopic scales. EEA is expected to reprogram individuals to face challenges questioning well-established norms and attitude of reckless destruction of nature in the name of development. It needs to garner enough support to have a second look at problems of the contemporary world, re-tooling of established skill-sets and development of new attributes with in-built ethical values to consider nature to the supreme<sup>21</sup>. Attributes like development of healthy respect for each other's values and ability to work in a multi-cultural team need to be created fast enough for the success of EEA<sup>22</sup>. Such things are bringing textbook knowledge to ground reality.

After looking at the results obtained from the survey, it becomes very clear that its high time to incorporate Environmental Education as a separate subject in our curriculum right from the childhood. The point of utmost importance being to impart them practical knowledge and make them aware about their environment and its importance; not just through textbooks but by experiencing and practicing.

Thus, Environmental education needs our timely and urgent attention as our environment would actually define how we work and live on this planet; in the years to come.

## Conclusion

The survey carried out indicates (shockingly) that even in contemporary times, whence our future relies on sustainability and there is so much awareness via media, not many amongst the students covering the spectrum from primary to graduates could relate with the concept of being an integral part of environment. Disappointingly, most lacked awareness about importance of environment in our survival and other overriding concepts like waste disposal and segregation, carbon footprint, or even renewable sources of energy like solar energy. The study indicates that maybe the attitude of students even as they mature, becomes progressively casual as they cannot correlate the direct effects of environmental degradation. Also the awareness levels shown by the students and plotted in the graphs is based on their answers which may be different from reality as they may have read about many things but are not using/practicing/following textbook knowledge.

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