



CONNECT BETWEEN DEEP ECOLOGY CENTRIC EDUCATION, TECHNOLOGY AND GENERAL ECOLOGICAL BEHAVIOUR

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Abstract

The biggest threat that the world is facing today is loss of biodiversity and climate change and hence there is a need for ushering in sustainable development that is not solely human centric. Too much tampering with nature out of greed and short sightedness has put the survival of this planet at risk. Clearing of native vegetation for human settlements and the problems of generation of excessive solid waste, fluid waste and smoke and emissions have already created an imbalance. When the technological developments are also not in line with the ecological ability of the earth to take the burden of that development it further worsens the situation.

Given the direction of technological change, countries which invest in educating their populations and build strong consumer economies with higher consciousness levels, and countries which have democratic institutions that can deal with these changes will benefit because having had their basic needs fulfilled, their people will be able to figure out how to take advantage of the advances in technology and also to direct the advancement of the same in desirable direction. This study also forays into need to measure carbon footprints, the magnitude of which is dependent upon general ecological behavior of the community. How to improve general ecological behavior is also the focus of the paper. India should invest in education that is deep ecology centric. Enhancement of 'satva' (virtuous) element will automatically lead to scientific temper that promotes healthy societal development that was prevalent in ancient India. There is an urgent need to address the poor level of individual consciousness and subsequently social consciousness across nations.

Key Word: Deep Ecology, General Ecological Behaviour, Satva Element.

Introduction

The world is facing the three dimensional challenge of sustainable development—economic, social and environmental. Extreme poverty is being faced by more than 1 billion people at global level and income inequality within and across countries has been on the rise; unsustainable production and consumption patterns have led to huge social and economic costs and may imperil life on the planet Earth.

The lack of internalization of environmental cost at all levels, be it at individual level, community level, societal level, national level or at global level in the production processes, has led to unsustainable development. The internalization of environmental cost is mandatory to assess the actual total cost of production. The actual realistic comparison of cost of production and benefit derived from production and consumption is possible in this scenario. Our journey of internalizing the environmental cost started with a modest effort in the year 2012-2013 under the aegis of Delhi University (DU) innovation project we estimated measurable carbon footprint of our college and that amounted to annual footprint of 1003075 Kgs CO₂. Furthering the research effort in a similar direction under the same banner in the year 2013-2015, we tried to establish a connect between the scale of GEB and spiritual ecological consciousness of two student communities that of DU vis-à-vis Dayalbagh Educational Institute (DEI) whose core curriculum were distinctly different. The DEI not only has a strong academic curriculum like DU but have elements of 'seva' of that of earth and humans deeply ingrained in their curriculum. Hence their ecological behavior slightly scored over DU students. The investment activities like construction also have foot prints that are measurable. These footprints can also be reduced by promoting environmentally sustainable construction practices. Looking at the problem of unsustainable development from a philosophical perspective, we feel that this has happened due to absence of focus on examination and appreciation of the sacred and fragile connect between all beings, living or non-living, of generations driven by a culture of greed, individualism, and too much obsession with self. There is a mad race to increase the consumption levels beyond the provision capacity of nature. The damage can be controlled if we succeed in instilling the traditional ideas of the individuals identifying their 'self' with others, and when the realm of 'others' expands to all components of the universe. This premise is substantiated and validated by a study (Rai, Srivastava & Shukla, 2015), which supports the hypothesis that deep ecology centric education systems should be developed where rather than plain talk on values we learn to practice and live by those very values within the premises of the educational institution. The next section on review of literature focuses on both trends in technological development and also the desired orientation of education system that will help us establish link between the two.



Review of Literature

On Technology

Technology of the past owes ecology an apology. Bull dozers, guns, cranes, nuclear weapons and other dangerous equipments have been created and used by mankind to clear forest covers for the sake of urbanization. Nuclear weapon that has been used in wars such as the one that was detonated in Hiroshima and Nagasaki in 1945 has left a huge impact on the environment. Radioactive waves that were produced has reduced the fertility of the land to zero and killed all living organisms in those areas. Not only has the usage of modern technology harmed the environment its production itself involves harming the environment. One common example would be the production of paper. Approximately sixty kilograms of paper is produced from a tree. But the world uses hundreds of thousands of tons of paper annually. That means thousands of trees were cut so that people can use paper for the production of newspapers, books, advertisements, study materials, and many more. It not only reduced the number of trees existing, but also endangered the species that used to live in that habitat. The ecological cycle that once existed there ceases to function.

The focus in this section is **to** understand the emerging trends in technology. Adverse impact of climate change on planet earth due to human centric development paradigm has led to continuous deliberation at various national and international forums to address the crisis situation.

The geopolitical shifts after the oil price crash and slow down of Chinese economy are worthy of close consideration. It would be a mistake to anticipate that price of oil will reach its erstwhile levels. Oil prices are going to oscillate for next few years.

The next positive shock is expected to come from clean energy. Wind and solar are moving forward on exponential curves. Rates of solar installations are doubling costs of photovoltaic module are declining by about 20 percent. Cost of solar installations will halve by 2022 despite the fact that governments are phasing out subsidies. 100 percent of the present needs of energy will be provided by solar power. It is likely to be almost free by 2035 just as the mobile call rates of today. It does not seem likely that this prediction will hold true, as less than one percent of current energy needs are provided by solar energy. However, experience of technologists is that the advances in exponential technologies are always of this nature. Initiatives in technological developments are in the direction of making paper obsolete, burying the bad stuff, letting plants and microbes clean up after us. Harnessing waves and tides, ocean thermal energy conversion, the sunny ways, desalinization are all efforts in positive direction of technology. This usage will never be used against ecology if deep ecological consciousness rises.

America which is spearheading the boom in technology will reinvent itself as it does in a span of 30-40 years.

On General Ecological Behaviour (GEB)

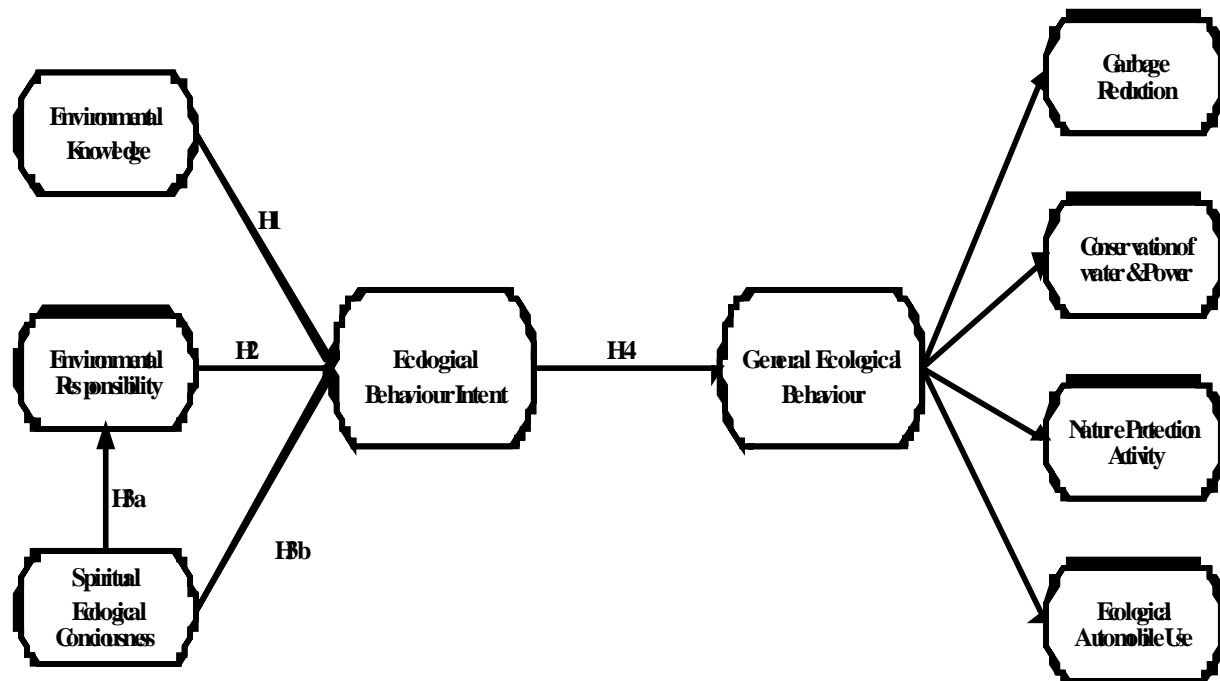
In all the three economic activities of production, consumption and investment general ecological behavior of actors as an individual or as a group can be assessed. In the literature majorly four subconstructs of GEB are identified: 1. Attempts to reduce garbage, be it bio-degradable organic garbage or non-biodegradable waste including electronic and solid waste. 2. Steps taken to conserve water and power, 3. Direct and indirect involvement in the Nature protection Activities. 4. Steps taken for ecological automobile use to reduce emissions. Even investment activities can be broken within these four subconstructs for instance your investment in a green building. By recording responses on these subconstructs which are further itemised on a likert scale of 0 to 5 we can estimate the score of an individual or group of individuals on the GEB scale.

On Spiritual Ecology

Each individual inherits a spiritual value which is an amalgam of faith and belief; cultural, moral and social values. In the contemporary phase we are familiar with the reality of destroying nature with our extravagant lifestyles. Accordingly our spirit or the individual being responds to this realisation depending upon level of spiritual evolution. The more we expand 'self' to identify with 'others' (people, animals and ecosystems) the more we understand ourselves as components of the universe. This concept of spiritual ecology if ingrained deeply is likely to convert into ecological behaviour that fosters development on the planet Earth which is sustainable respecting claims of the posterity. In line with this hypothesis the primary objective of the present study was to explore a connect between spiritual ecological consciousness, and general ecological behaviour via moderating and intermediary factors, environmental knowledge and environmental behaviour intention and responsibility using structural equation modeling.

Through a carefully designed survey a scale to measure spiritual ecological consciousness has been developed. Constructs of environmental knowledge, environmental intention and responsibility and general ecological behaviour (comprising of four

sub-constructs) has been modified (Kaiser et al 1999) to use in the present study. A comparative study of two sets of student community of Dayalbagh Educational Institution's edification based on regular spiritual practice of community service "seva" vis a vis a Delhi University student community's edification resting on value based education system but lacking the regular rigour of a spiritual practice has been attempted. The interesting findings of the study support the hypothesis and the results indicate comprehensive theorising which differ from the existing theory in scope



The connect between spiritual ecological consciousness leading to environmental responsibility as well as strengthening of behavioural intent as an intermediating factor converting in to responsible ecological behavioural conduct in both the data sets of Delhi University (DU) ((sec-<->er 0.1706, er<->ebi 0.1900, ebi<->geb 0.3851)) and Dayalbagh Educational Institute (DEI) ((sec-<->er 0.2281, er<->ebi 0.2011, ebi<->geb 0.4269)) was found to be significant.

Hypothesis

The review of literature and current developments in the world economy has lent the hypothesis for our research. The futuristic technologies can be made more environment friendly if education system is governed by principles of spiritual ecology.

1. Technological changes that have happened have had anthropocentric orientation.
2. Future technological changes to solve the energy crisis will be in the direction of using renewable sources.
3. The orientation of education should be deep ecology centric.



Methodology

The framework of the study is built by observing the general trend of development which has taken place across nations and particularly the developing countries like India (being the fulcrum of our analysis) with total disregard to, or less concern on assessing impact on the planet earth or the natural resources of the country.

Analysis of futuristic trend in technological innovations based on literature review is the focus. The direction of technological shifts as given by researchers will be analysed to strengthen our call to shift the focus of education to spiritual ecology.

This premise has been tested by our study of ecological behavior of two student communities with slightly different knowledge systems where in the levels/index of spiritual ecological consciousness which was found to be different because of one distinct element of practice of working in the fields i.e 'seva' done as a part of the curriculum may be analysed to further reinforce the direction of education system. This study was done under the aegis of interdisciplinary Innovation project funded by Delhi University in the year 2013-2015.

Validation for education system based on spiritual ecological orientation This paper is using an exploratory orientation to emphasize that each nation should have a unique combination in terms of technology adoption and adaptation to produce goods and services keeping in view diversity of resources each region is bestowed with, and thereby maintain the native ecosystems of the region. Identification and maintenance of that unique mix of technology with natural resource base can be better looked into with spiritual ecological orientation and developing this orientation should be the objective of education policy.

Results in the Form of Perspectives Arising Out of the Exploratory Research

The relevance of previous study on consciousness and its link with technology and varied streams of study is very interesting to observe.

Technology essentially means techniques adopted to do things easily, with efficiency. The appropriateness of technology is dependent on societal needs, and these have to be in harmony with the environmental concerns of any region. The satisfaction of basic needs of the masses has to be the focus of development and not the type of development that benefits the select few. New initiatives are being taken by companies, universities or foundations to expand STEM courses (science, technology, engineering and math). A liberal education is also equally relevant, and technical training is the new path forward. While a broad general education helps foster critical thinking and creativity, economic dynamism, innovation and entrepreneurship are the kinds of teaching that should be promoted in the present times. Exposure to a variety of fields produces synergy and cross fertilization. Yes, science and technology are crucial components of this education, but so are English and philosophy.

Innovation is not simply a technical matter but rather one of understanding how people and societies work, what they need and want. America will not dominate the 21st century by making cheaper computer chips but instead by constantly reimagining how computers and other new technologies interact with human beings and the resource base they live in. These new technologies should be diverse and should be customized to bring development in accordance with the local native environment to jack up the employment opportunities not in few centers alone. These should be so diffused that it brings promotes balanced development across the different parts of the country in particular and different parts of the globe in general.

The DNA of the technology should be such that it weds with humanity, marries with liberal art that gives way to solving the problems that humanity is facing. Current education system prevalent amongst most Asian nations is oriented more or less towards test taking and memorization which has its own strength but is not inducing creativity, stirring thinking abilities and problem solving. As per Jack Ma who is founder of Alibaba, even Chinese education system does not nourish complete intelligence of students. Innovation in business has always involved insights beyond technology. Consider the case of Facebook. Mark Zuckerberg was a classic liberal arts student who also happened to be passionately interested in computers. He studied ancient Greek intensively in high school and majored in psychology while he attended college. And Facebook's innovations have a lot to do with psychology. Zuckerberg understands computers deeply and uses great coders to put his ideas into practice, but as he has put it, Facebook is "as much psychology and sociology as it is technology."

Any educational program that includes a significant portion of the sciences is definitely broad based. Engineers, scientists and mathematicians develop "critical thinking" skills. They just need to be more perceptive about the impact of technology on bio diversity as a whole. There are no disciplines that demand more thinking skills than the sciences. Study of liberal arts is equally important. Liberal arts are seven in number and they are conventionally divided into quadrivium and trivium. Trivium falls in the category of lower arts consisting of logic, grammar and rhetoric. Quadrivium comprises of geometry,



arithmetic, astronomy and music. Out of four, three are either scientific or mathematical. Inter-linkages in the study of all these subjects are vital for technology development.

The discussion on technology and spiritual ecology centric education system becomes very relevant in times of environmental crisis. It is this generation which will develop the future technology. A spiritual ecology centric education system can be used to increase the 'satva' component. A developer exposed to such a system of education will always weigh the impact of the technology they are working with on the other components of the society at large, and specifically on nature. This change in attitude of the young generation will help the country restore its lost glory as pioneers in mathematics and science as was in ancient India. Going to the roots is the panacea for the kinds of ills that are ailing the country today.

Discussions

Talk on technological development is not something new. This has been under discussion for quite some time. Let us examine what kind of technology is coming to developing countries like India. The other way of putting it is the technological absorption that is happening in our country despite such euphoria over it since last two decades needs to be revisited. The relocation of low end technology and technological imitation has been the in thing in our country for past few decades, barring a few exceptions. Looking at the trend it can be inferred that we are not creators of core technology but are consumers of technology. We have learnt to apply and use core technology coming from the West. If we relook at the environment for software development in the country, it can be inferred that even in this space we are not leaders. Only the low end software is being developed in India at large. The dismal feature of the developing countries, with special reference to India, is that we are not creators of technology but are big consumers. The consumerist mode of our socio-economic fabric is leading to more environmental problems.

We Have to Have a Multi Pronged Approach to Development

Balanced regional development and not metro centric unbalanced development should be the focus. Lack of development in most of the rural, semi urban and small urban regions have led to large scale migration of skilled labour and educated people to the few more developed parts of the country. This flight of brain and centering of intellectual capital in only a few centres is marring the growth potential of the less developed parts of the country. Intellectual capital will obviously come to places where there is scope for development and growth. A short sighted policy decision, poor governance, bureaucratic red tape and corruption all are collectively responsible for the present state of affairs in the country.

The biggest threat that the world is facing today is loss of biodiversity and climate change and hence there is a need for sustainable development. When the technological developments are not in line with the ecological ability of the earth to take the burden of that development, clearing of native vegetation for human settlements and the problems of generation of excessive solid waste, fluid waste and smoke create an imbalance. Too much tampering with nature out of greed and short sightedness has put the survival of this planet at risk.

Given the direction of technological change, countries which invest in educating their populations and build strong consumer economies, and countries which have democratic institutions that can deal with social change will benefit because having had their basic needs fulfilled, their people will be able to figure out how to take advantage of the advances in technology.

India should invest in education that is deep ecology centric. Enhancement of 'satva' element will automatically lead to scientific temper that was prevalent in ancient India. The most path breaking principles and discoveries in science, mathematics, economics and medicine are the contributions of scholars of ancient India where the deep ecology centric *gurukulshikshapranali* was followed.

A happy and encouraging change in this direction has begun in the form of the concept of eco-villages that is slowly catching up in some countries including India. Ecovillages are intentional communities that care for the earth and its people. These communities are formed by the coming together of likeminded persons united by shared ecological, social-economic and cultural-spiritual values. Ecovillages have been formed in Europe, America, Japan, Asia and Africa. According to Earth Rights they are centres of learning and living that are showing a way towards a brighter future for all. Ecovillage formation is gaining momentum as it provides a viable alternative to existing globalized inhumane structures by exploring decentralized solutions on a community level and by connecting traditional and contemporary knowledge for a peaceful and sustainable future and by encouraging spiritual growth.

Conclusion

Achieving sustainable development will require strengthened actions and policies at global, national and regional level to deliver on the legitimate ambition towards further economic and social progress. This would necessitate growth in income

and employment through responsible technological development and adoption that is in line with the spirit of spiritual ecology that strengthens environmental protection. We are at the crossroads of a development phase where the interdependencies in the various components of nature have to be very meticulously comprehended. Technological adaptation is the need of the hour. The generations to come will have to learn to learn, unlearn and relearn to take care of this fragility in nature that we are passing on as a legacy, and careful choices have to be made. Meditation, yogic practice and community service sessions should be internalized in the curriculum to get a discriminatory competence to appreciate, absorb and balance emerging values that concerns areas of sustainability, ecosystems, harmony, cultural pluralism and development with civility and equity. Socrates' method of learning, of real critical thinking skills with passion should be the ultimate objective of education with technology or without technology.

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