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A Study on Environmental Understanding, Attitude and Practices Gap in Indian Higher Education - An Overview and Theoretical Framework

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ABSTRACT

The purpose of this paper is to identify practices gap existing between environmental understanding and environmental attitude of students with respect to Indian higher education. Researchers have proposed a theoretical framework using systematic literature review and interpretive structural modelling to understand and analyze environmental concern. Proposed research study has utilized primary and secondary data. In order to gather primary data, interview schedule and questionnaire was provided for expert opinion from environmental experts and academicians to understand the influence of identified variables. The practices of environmentally responsible behaviour need to be in concert with education. The authors have attempted to discuss and debate the relationship among variables using interpretive structural modelling (ISM). Environmental governance and sustainable development attitude emerged as the most significant factors. All variables were interconnected and mutually influencing each other. Three levels were derived from the model. A sustainable development environmental education model for Indian higher education has been derived and proposed by the authors showcasing a contextual relation between the identified variables having practical implications.

INTRODUCTION

The most vital factor for the development of a country is education. It is changing with changing scenarios. Education provides solution to several issues faced by a human being. India needs to focus on education for more educated and efficient people to build our nation (Lombardi 2007). Kaushik & Singh (2004) emphasized that to become a global partner India need to focus on the research and development. All stakeholders have to make joint efforts to get solutions to the problems in higher education in India.

In India, environmental education has been a major criterion for human resource development. India is one of the countries which has shown the commitment for improvement and protection of the environment (Saigal et al. 2005). Today, the median age of India is 32; a good ten years lower than most other nations in the world (Bloom & Canning 2004).

Environmental education is a compulsory course mandatory at all levels in India. Sustainability and green economy objectives are a crucial part of India's education policy. However,challenges hamper the growth strategies of environment protection ,Faculty and students lack in skill and competence. India has examples of successful community-based initiatives, but these often have resource implications. Development of learning in the environmental field has changed the priorities and policy formation (Banga Chhokar 2010).

THEORETICAL FRAMEWORK

Sustainable development attitude: Barth et al. (2007) reported that developing economies need environmental competency for sustainable development. There exists a formal and informal relationship to necessitating competence development in higher education requiring application of theory in day to day life. Sterling (2001) discussed the educational system having a managerial view of education and not environmental way of education as it does not account for sustainability. Education for sustainable development needs to change from transmissive to transformative learning. Educators for a sustainability need to emphasize on the ecological educational paradigm and environmental culture can be developed.

Dale & Newman (2005) differentiated between sustainable development education from environmental education and stressed the importance of inculcating learning to sustainable development education. Reconciliation of sustainability and development is required in higher education. Velazquez et al. (2005) explored the factors that could hinder the application of the sustainability

creativities in higher educational institutions in order to assist current sustainability initiatives in sync with the United Nations. Desired circumstances for the effective application of sustainability programs do not exist. However, sustainability initiatives continue in higher education despite these difficulties.

Indian environment education: Environmental education talks about reaction through education towards environmental changes for life long education; developing attributes and skills for active and productive role to protect the environment (Day 2002).

For a life long education, it is important to understand the environment and the changes happening around the world. Environment education plays an important role in achieving sustainability and green economy and to show a creative role towards refining life and guarding the environment with due regard given to moral standards.

Ramsden (2003) explored the relationship between environmental education and sustainable development in India providing an overview of various initiatives regarding the role of environmental education towards sustainable development at a global level in general and national level in particular. Nowadays people are living in harmony with nature and follow environmentally sound practices (Wackernagel & Rees 1998). Ravindranath (2007) described the recent importance of environmental education and the need is being highlighted and several issues relating to satisfactory learning and teaching methods, resource development and capacity building necessities for its operative execution. Participation of change in teaching and learning pedagogy, material change are required for effective implementation.

Environmental knowledge: Jadhav et al. (2014) discussed that the current concern for the globe is environmental sustainability and higher education can play an active role in relation to environmental sustainability. Universities are the top bodies in the higher education system and can provide environmental education through their curricular policy and inquiry.

Svanström et al. (2008) discussed the commonalities that can be found in education outcomes for maintainable progress.

Wals & Jickling (2002) highlighted on higher education's accountability to perpetual experiment and evaluation value and knowledge entitlements that have inflexible propensities.

Granados (2011) stated that with the advancement of the world towards a contingent scenario in future it needs to be directed to sustainability in order to achieve social equality and justice. Learning is impossible without change.

Environmental activism: NGO and many international organisations take immense efforts to shape widespread environmental behaviour all over the world Wapner (1995). The Indian economy has added a dimension, i.e. environmental movement. It poses a challenge to the dominant notions of development (Gadgil & Guha 1994).

Jain & Kaur (2004) talked about worldwide business firms taking initiatives and have started responding to environmental challenges. Environmentalism has now become a worldwide phenomenon (Tanner 1980). Eco-historicism, environmental justice, and new materialism is the new area of research in environmental education bringing positive results to environmental humanities and dissemination of knowledge in new ways. Many environmental experts are coming to work as part of a broad interdisciplinary organisation entitled "the environmental humanities." (Bergthaller et al. 2014).

Environmental governance: Bullard & Johnson (2000) talked about education, empowerment and government regulation and environment practices and policies that need to be administered. Though, common advocates have tried to modify the way government executes ecological, wellbeing, and civil rights laws. Positive change needs to be ap-

Table 1: Descriptive statistics.

Factors	N	Minimum	Maximum	Mean	Std. Deviation
Sustainable development attitude	123	1	5	3.87	1.248
Environmental attitude	123	1	5	3.45	1.326
Environmentalism	123	1	5	3.37	1.327
Indian Environment education	123	1	5	3.55	1.294
Environmental behavior	123	1	5	3.79	1.256
Environment knowledge	123	1	5	3.67	1.277
Environmental justice	123	1	5	3.41	1.234
Environmental activism	123	1	5	3.38	1.452
Environmental governance	123	1	5	3.37	1.344
Valid N (listwise)	123				

plied with respect to law and governance. Henisz (2000) derived a new extent of governmental limitations from a humble three-dimensional model of political communication that includes evidence on the number of independent divisions of government with rejection power and the delivery of biased decisions.

Agrawal & Bauer (2005) discussed about the skills of government and the making of environmental subjects and inspect the possible reasons for rural residents to protect the environment. Involvement in established regimes of the environmental guideline is must to simplify innovative ways of being appreciative about the environment. International environment authority should present the amendments required to spread the new formal method to ecological governance from local and international areas of compliance for all governance solutions, including nationwide environmental and usual resource usage strategies and different level governance solutions that are rapidly increasing and addressing comprehensive environmental alteration (Paavola 2007).

RESEARCH METHODOLOGY

The study aimed at conducting research in three phases, i.e., ascertaining factors from a systematic literature review, validation of the identified factors through empirical research and interpretive structure modelling and classification.

Table 2: Identified factors for ISM analysis.

V1	Sustainable development attitude
V2	Indian Environment Education
V3	Environment Knowledge
V4	Environmental activism
V5	Environmental Governance

Identification of Factors

Initially, ten variables were drawn from literature which are discussed in a theoretical framework. The researchers have raised similar issues and concerns in the past studies with higher education all over the globe. The selected variables are given in Table 1.

Empirical Research

In Table 1, factors were identified after a survey conducted consisting of ten factors and the reliability was tested by the coefficient of reliability using Cronbach's α. Internal consistency was found above the threshold. The sample was chosen in such a way that the respondents belonged to a wide spectrum of institutes with respect to higher education and environment experts. Based on respondents rating of 1 to 5, mean score >3 and standard deviation 1.229 was considered for factor validation. Further, all the factors were used for analysis in ISM (Table 2).

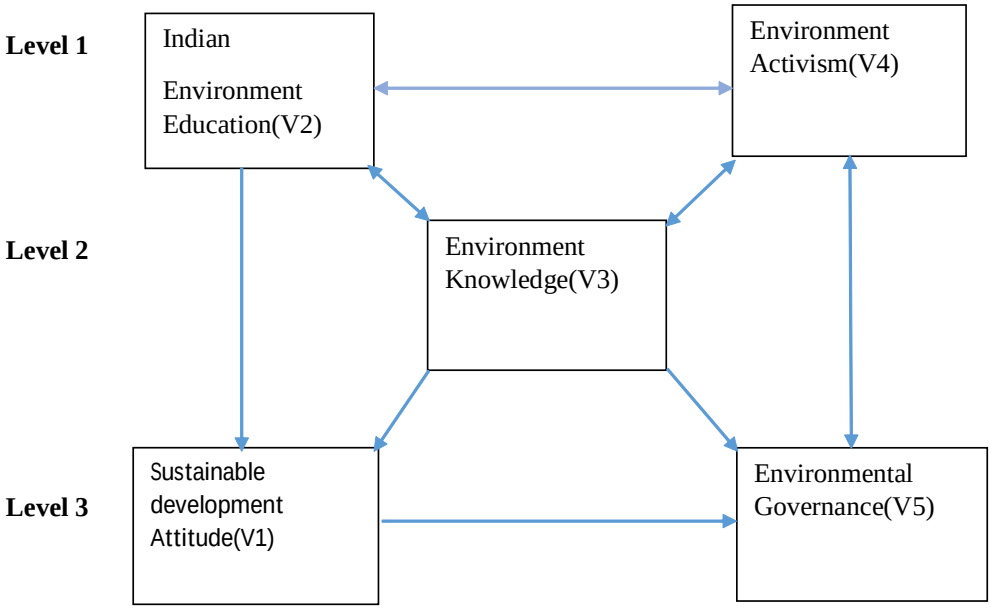

Fig. 1: A sustainable development environment education(EE) model for Indian higher education.

Table 3: Structural Self Interaction Matrix (Authors' contribution).

↓ →	V5	V4	V3	V2	V1
V1	As	A	A	A	
V2	V	X	X		
V3	V	X			
V4	X				
V5					

Table 4: Reachability matrix (Authors' contribution)

i J→ ↓	V1	V2	V3	V4	V5	Driving Variables
V1	1	0	0	0	0	1
V2	1	1	1	1	1	5
V3	1	1	1	1	1	5
V4	1	1	1	1	1	5
V5	1	0	0	1	1	3
Dependent Variables	5	3	3	4	4	

Table 5: Level partitioning (Authors' contribution).

i J→ ↓	Reachability Set	Antecedent Set	RS∩AS	Level
V1	(1)	(1,2,3,4,5)	(1)	
V2	(1,2,3,4,5)	(2,4)	(2,4)	Level 1
V3	(1,2,3,4,5)	(2,3,4)	(2,3,4)	
V4	(1,2,3,4,5)	(2,3,4,5)	(2,3,4,5)	Level 1
V5	(1,4,5)	(2,3,4,5)	(2,3,4,5)	

Table 6: Level partitioning (Authors' contribution).

i J→ ↓	Reachability Set	Antecedent Set	RS∩AS	Level
V1	(1)	(1,3,5)	(1)	
V3	(1,3,5)	(3)	(3)	Level 2
V5	(1,5)	(3,5)	(3,5)	

Table 7: Level partitioning (Authors' contribution).

i J→ ↓	Reachability Set	Antecedent Set	RS∩AS	Level
V1	(1)	(1,5)	(1)	Level 3
V5	(1,5)	(5)	(5)	Level 3

Table 8: Level matrix (Authors' contribution).

Level	Variable
1	Indian Environment education
1	Environmental governance
2	Environment knowledge
3	Sustainable development attitude
3	Environmental governance

ISM Technique and Model Development

After selecting the factors, ISM was applied. ISM has 3 steps. It provides solutions through contextual relation between variables. ISM is interpretive because opinion is taken from experts for the research problem studied. It is structural as it studies the contextual relationship between variables of the system under study and it is modelling as the final outcome is a visual presentation. Following are the steps in ISM:

V, A, X, O indicate the contextual relationship in self-interaction matrix (SSIM) by pairwise association (I shows row factors and J shows column factors) (Table 3). Inputs were taken from experts from academia and environment field with substantial experience and understanding in the field of environment and higher education. The existing relationship was decided if more the 50% experts had the same opinion. The final decision taken was dependent on observations, experience and judgement.

To develop a reachability matrix derived from SSIM conversion into binary digit as per rule in order to obtain final reachability matrix (Table 4).

Factors further are grouped in levels based on reachability and antecedents sets.

In Table 5 V2 and V4 were arrived at level 1.

In Table 6 V3 is arrived at level 1.

In Table 7 V1 and V5 is arrived at level 3.

In Table 8 levels were identified and the final reachability matrix was used for ISM model.

RESULTS AND DISCUSSION

ISM-based model: Fig. 1 is ISM model showing a mutual relationship between identified variables. The arrow in the figure implies 'leads to'. Out of the three levels of the model level 3 has the highest importance. Transitive relations are not shown for avoiding complexity. As per the model, environmental governance and sustainable development attitude are the significant factor. Environmental governance influences the sustainable development attitude. The environment knowledge drives education, activism, governance and sustainability. Indian environment education and environmental activism are influencing each other and are interconnected and lead to environmental knowledge. Environmental knowledge mediates between level 1 and level 3. Indian higher education has been dynamically interrelating with the universal green movement, and this has motivated the credentials of their concerns and the development of their strategies. However, the involvement in the multinational environmental undertaking is still limited.

IMPLICATIONS

All factors are very important for sustainable environmental education. Indian higher education needs to fill the gap between understanding and practices of environment. Institutes lack attention and precision in developing and retaining actions for environment development and imbibing it in curriculum. Therefore, they fail to make an impact. The proposed theoretical framework can be used to develop strategies which are intensive, concrete and operative for educational institutes and environment policy makers.

RESEARCH LIMITATIONS

The study is based on the application of ISM findings which requires certain modifications in real settings. The study can be repeated for individual institutes to get the real picture.

FURTHER RESEARCH DIRECTIONS

The model proposed using ISM can be further validated by testing empirically using structural equation modelling. Each factor has a relative weight which is not visible in the hierarchy of ISM. Further analytical network process can be done to derive the same. Total interpretive structural modelling, a further advanced technique can be used for elaboration.

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