Impact of Whole House Approach and Strategic Environment Education on Environment Responsible Behaviour, Concern for Environment and Environment Knowledge

Gangotri Dash*

Dr. Mohan A.K**

Abstract:

Growing environmental issues need the attention of human being irrespective of age and position. Childhood is considered as the best period to inculcate environmental habits to create a sustainable future. Education has an important role in providing information and skills to practice such habits. In this studypre-post quasi experimental design was adopted and effect of two different intervention strategies such as 'strategic environment education' and 'whole house approach' on students' environment responsible behaviour, concern and knowledge was tested. Government high school students of Balasore district of Odisha participated in the study. Using SPSS, pre and post-test data were analyzed. It was found that 'whole house approach' has better impact on students' environment responsible behavior, concern and knowledge than 'strategic environment education'.

Key Words: environment responsible behavior, concern for environment, environment knowledge, parents involvement.

* Research Scholar, Department of Studies in Social Work, University of Mysore, Mysuru

** Associate Professor, Central University of Kerala, Kasaragod, Kerala

Environment and human-being are two inseparable entities. Human actions have both positive and negative effect on environment. Whether knowingly or unknowingly, a destructive action by individual towards environment for fulfilling her/his needs and wants can becomethreat to own survival. Further, an individual's behaviour not only affect her/him but also other creatures on the earth. Hence, each individual has responsibility to protect, conserve and restore environment. According to Krajhanzl (2010), environment behaviour includes all human behaviour as people are constantly interacting with environment. Steg and Vlek (2009) defined environment behaviour as behaviour that benefits the environment.

Childhood experience with nature have positive impact on children's behaviour towards environment (Palmberg& Kuru, 2000) and also influences their participation in nature activity in adulthood (Asah, 2012). Hence, children need nature experiences as well as must be responsible to protect environment. According to Strong (1998) children's consumer power is growing and represent specific products and services in market. Their product choice has influence on present and future environment. Hence children need opportunity for informed decision making at personal level, home, school and community (Chawla & Cushing, 2007). If the children's concern for environment will not be taken into consideration, then unintentionally various dimensions of environmentrelated to needs of children (playground, healthy food, hygienic living space etc.) may be ignored (Chawla, 1988).

Skills and knowledge about environment issues and environmental actions are important factors which affect the environment behaviour (Hines, et. al, 1987; Kollmuss&Agyeman, 2002). Education is being considered as an important tool to promote environment sustainability and is expected to provide appropriate knowledge, information and sustainability skills for environment action (UNESCO, 2005). However environment education curriculum has concentrated on environmental problems rather than the action needed to tackle these issues (Siddiqui & Khan, 2015). Hence, environment education need to be developed strategically and it must includecase studies (Gaterslebn, et.al, 2002), information on social proof (Linden, 2015), outdoor environment experience (Behera&Samal, 2013), goal setting (Sintov et. al, 2010) and opportunity for environment action (Saini, 2014).

Chawla (1988) suggested that to make children care about nature, it is necessary to combine communities which give them something to care about. Parents and educators need to advocate the rights of children to enable them to have enriching experience with living beings, so that they can learn to become caretakers of the earth (Davis, 1998). Children are more likely to participate in community activity when they get support from their parents or when they observe their parents engaged actively in such activities (Pancer& Pratt, 1999). Students whose parents are involved in their education are more likely to have positive learning outcome than whose parents are not involved (Center for Disease Control and Prevention, 2012). Children get formal education at schools but their learning continues at home and in community. Parents' play a very important role in overall learning and education of children by facilitating diverse learning experiences outside school. Parents involvement has positive effect on social skills, behaviour, sense of personal competence and efficacy for learning (Emerson, et. al, 2012).

Based on the suggestions mentioned by earlier research, two intervention strategies such as 'strategic environment education' and 'whole house approach' were prepared and experimented on high school students to find out the impact of environment responsible behavior, concern and knowledge. Whole house approach had included the intervention with parents and students both.

Objectives:

- To assess the effect of whole house approach and strategic environment education on students' environment responsible behaviour, concern for environment and environment knowledge

- To compare the impact of whole house approach and strategic environment education.

Hypotheses:

- Hypothesis1: Whole house approach and strategic environment education will improve students' environment responsible behaviour, concern for environment and environment knowledge.

- Hypothesis 2: Whole house approach will have better impact than strategic environment education on students' environment responsible behaviour, concern for environment and environment knowledge.

Methodology:

This paper present the part of a study done for doctoral study. This study has been conducted using quasi experimental design. Interventions were conducted in government high schools of Balasore district. Three randomly selected government high schools are the part of this paper. Only 9th standard students of these schools were included in the study.

Questionnaire containing environment responsible behavior, concern and knowledge items was used in the study. Pre testing of the tool was done and validity and reliability of the scales were examined using exploratory factor analysis and Cronbach alpha respectively. Environment responsible behavior scale items are about waste segregation, water use, energy use in personal, household and pubic space. Concern for environment scale contains environment attitude, perceived ability to perform environment action, and value items. Environment knowledge items are framed to know the understanding of children about the impact of different actions of human beings (water, energy and waste) on environment. There are total 19 items in environment responsible behavior scale, 14 items in concern for environment scale and 12 items in environment knowledge measure. There scales were found reliable as Cronbach alpha value for environment responsible behavior and concern for environment were 0.70 and 0.65 respectively. Two different interventions i.e. strategic environment education and whole house approach were tested in this study. Strategic environment education included waste, water and energy management information and skills for students. In this, pictures and charts were used to disseminate information and demonstrated skills to manage environmental resources. Seven sessions were designed. Group discussion, reflection, story-telling, role play, commitment etc. techniques were used in the sessions. Whole house approach included both students and their parents. Students were provided knowledge and skills about environment management at school and motivational interviews were conducted for parents to motivate them about the environment responsible practices. Motivational interviewing is a method developed by Miller and Rollnick (2002) to motivate clients for desired behavior change by focusing on their positive aspects, understanding their concerns and values, listening them with empathy and empowering their self-efficacy.

Whole house approach was conducted for the students of school 1, only strategic environment education intervention was given to students of school 2 and students of school 3 were kept under control. Intervention period was for one and half months. After one week of pre-test, intervention sessions were conducted and post-test was done after one and half months of last intervention.

For data analysis, in this paper, 30 students from each school, who have attended all the sessions were chosen. Statistical tools like t-test and ANCOVA were used to interpret the data.

Analysis:

Pre-post comparison of students intervened through whole house approach

H_{01}: There is no significant improvement in the mean score of environment responsible behaviour at posttest stage than the mean score of environment responsible behaviour at pretest stage of the students of school 1 intervened through whole house approach.

H_{02}: There is no significant improvement in the mean score of concern for environment at posttest than the mean score of concern for environment at pretest of the students of school 1 intervened through whole house approach.

H_{03}: There is no significant improvement in the mean score of environment knowledge at posttest than the mean score of environment knowledge at pretest of the students of school 1 intervened through whole house approach.

Table:1: Correlated t-test for students of Schoo-1 intervened through whole house approach

Hypothesis	Testing	M	SD	N	R	Correlated t-Test	Remark
H_{01}	Pretest	58.20	9.90	30	0.73	7.958	p (0.000) <0.05
	Posttest	70.57	11.01				
H_{02}	Pretest	48.30	6.13	30	0.62	4.77	p (0.000) <0.05
	Posttest	53.60	6.30				
H_{03}	Pretest	13.83	3.13	30	0.50	4.89	p (0.000) <0.05
	Posttest	17.90	5.03				

From table -1 it is evident that correlated t-test values 7.958 (vide H_{01}), 4.77 (vide H_{02}), and 4.89 (vide H_{03}) are significant at 0.05 level of significance and degree of freedom 29. It indicates pre and post mean scores of environment responsible behaviour, concern for environment and environment knowledge differ significantly. Further, mean scores of students for environment responsible behaviour, concern for environment and environment knowledge at post-test are 70.75, 53.60 and 17. 90 respectively which are greater than the respective pretest scores. Hence, the null hypotheses are rejected. The alternative hypotheses are

H_{11}: There is significant improvement in the mean score of environment responsible behaviour at posttest stage than the mean score of environment responsible behaviour at pretest stage of the students of school 1 intervened through whole house approach.

H_{12}: There is significant improvement in the mean score of concern for environment at posttest than the mean score of concern for environment at pretest of the students of school 1 intervened through whole house approach.

H_{13}: There is significant improvement in the mean score of environment knowledge at posttest than the mean score of environment knowledge at pretest of the students of school 1 intervened through whole house approach.

Pre-post comparison of students intervened through strategic environment education

H_{04}: There is no significant improvement in the mean score of environment responsible behaviour at posttest stage than the mean score of environment responsible behaviour at pretest stage of the students of school 2 intervened through strategic environment education.

H_{05}: There is no significant improvement in the mean score of concern for environment at posttest than the mean score of concern for environment at pretest of the students of school 2 intervened through strategic environment education.

H_{06}: There is no significant improvement in the mean score of environment knowledge at posttest than the mean score of environment knowledge at pretest of the students of school 2 intervened through strategic environment education.

Table:2: Correlated t-test for students of Schoo-2 intervened through strategic environment education

Hypothesis	Testing	M	SD	N	R	Correlated t-Test	Remark
H_{04}	Pretest	50.73	7.45	30	0.72	7.63	p (0.000) <0.05
	Posttest	61.57	9.80				
H_{05}	Pretest	49.80	6.00	30	0.72	5.27	p (0.000) <0.05
	Posttest	54.00	5.83				
H_{06}	Pretest	12.87	4.08	30	0.67	4.33	p (0.000) <0.05
	Posttest	15.77	4.80				

From table -2 it can be seen that correlated t-test values 7.63 (vide H_{04}), 5.27 (vide H_{05}), and 4.33 (vide H_{06}) are significant at 0.05 level of significance and degree of freedom 29. It indicates pre and post mean scores of environment responsible behaviour, concern for environment and environment knowledge differ significantly. Again the post-test scores of students with regard to environment responsible behaviour (61.75), concern for environment (54.0) and environment knowledge (15.77) are more than the respective pre-test scores. Hence, the null hypotheses are rejected. The alternative hypotheses are

H_{14}: There is significant improvement in the mean score of environment responsible behaviour at posttest stage than the mean score of environment responsible behaviour at pretest stage of the students of school 2 intervened through strategic environment education.

H_{15}: There is significant improvement in the mean score of concern for environment at posttest than the mean score of concern for environment at pretest of the students of school 2 intervened through strategic environment education.

H_{16}: There is significant improvement in the mean score of environment knowledge at posttest than the mean score of environment knowledge at pretest of the students of school 2 intervened through strategic environment education.

Pre-post comparison of students intervened through strategic environment education

H_{07}: There is no significant improvement in the mean score of environment responsible behaviour at posttest stage than the mean score of environment responsible behaviour at pretest stage of the students of controlled school 3.

H_{08}: There is no significant improvement in the mean score of concern for environment at posttest than the mean score of concern for environment at pretest of the students of controlled school 3.

H_{09}: There is no significant improvement in the mean score of environment knowledge at posttest than the mean score of environment knowledge at pretest of the students of controlled school 3.

Table:3: Correlated t-test for students of Schoo-3 under control

Hypothesis	Testing	M	SD	N	R	Correlated t-Test	Remark
H_{07}	Pretest	60.40	8.77	30	0.95	1.51	p (0.141) >0.05
	Posttest	59.67	8.71				
H_{08}	Pretest	46.20	7.14	30	0.75	0.907	p (0.372) >0.05
	Posttest	47.17	6.10				
H_{09}	Pretest	13.63	3.03	30	0.78	0.574	p (0.570) >0.05
	Posttest	13.37	3.30				

From table -3 it can be seen that correlated t-test values 1.51 (vide H_{07}), 0.907 (vide H_{08}), and 0.574 (vide H_{09}) are not significant at 0.05 level of significance and degree of freedom 29. It indicates pre and post mean scores of environment responsible behaviour, concern for environment and environment knowledge do not differ significantly. Hence, the null hypotheses are accepted.

Effect of whole house approach and strategic environment education on environment responsible behaviour, concern for environment and environment and environment knowledge

H_{010}: There is no significant difference in the adjusted mean scores of environment responsible behaviour of students of school 1, 2 and 3 by considering pre-environment responsible behaviour as covariate.

H_{011}: There is no significant difference in the adjusted mean scores of concern for environment of students of school 1, 2 and 3 by considering pre-concern for environment as covariate

H_{012}: There is no significant difference in the adjusted mean scores of environment knowledge of students of school 1, 2 and 3 by considering environment knowledge as covariate.
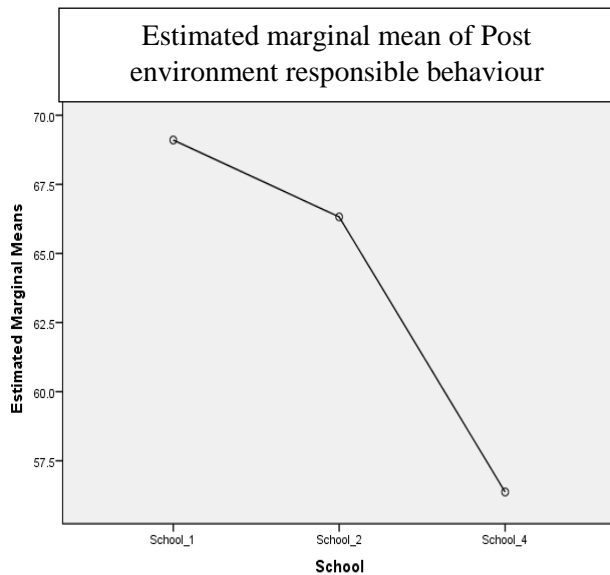
Table:4: ANCOVA test to compare the effect of whole house approach and strategic environment education

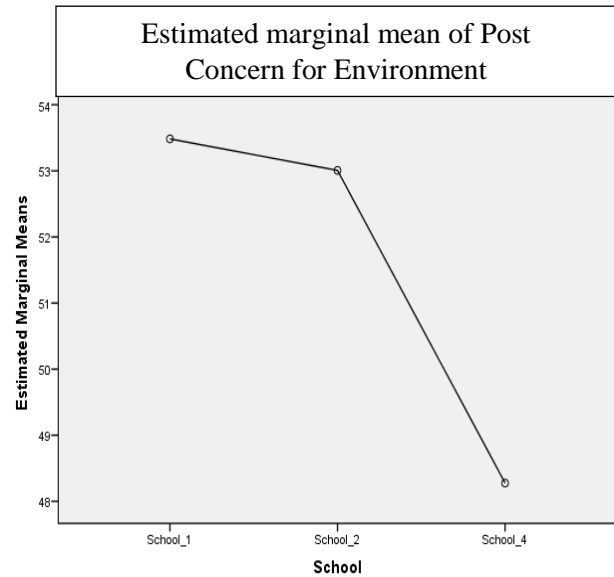| Hypothesis	Sources	Df	Sum of Square	Mean of Sum of Square	F-Value	Remark
H_{010}	Intervention	2	2558.56	1279.28	28.442	p(0.000)<0.05
	Error	86	3868.13	44.97		
	Total	89				
H_{011}	Intervention	2	477.62	238.81	10.34	p(0.000)<0.05
	Error	86	1984.58	23.07		
	Total	89				
H_{012}	Intervention	2	300.49	150.24	11.55	p(0.000)<0.05
	Error	86	1118.41	13.00		
	Total	89				

From the table number 4, it is evident that F values 28.44 (videH_{010}), 10.34 (videH_{011}), and 11.55 (videH_{010}) are significant at 0.05 level of significance and degree of freedom 2/89. It shows that the adjusted means scores of environment responsible behaviour, concern for environment, environment knowledge of whole house approach intervention school (1), strategic environment education school (2) and control school(3) differ significantly when the respective pre scores of environment responsible behaviour, concern for environment, and environment knowledge are considered as covariate. Hence, different interventions whole house approach, strategic

environment education and control have different influence on the groups with regard to bring change in the above mentioned variables.
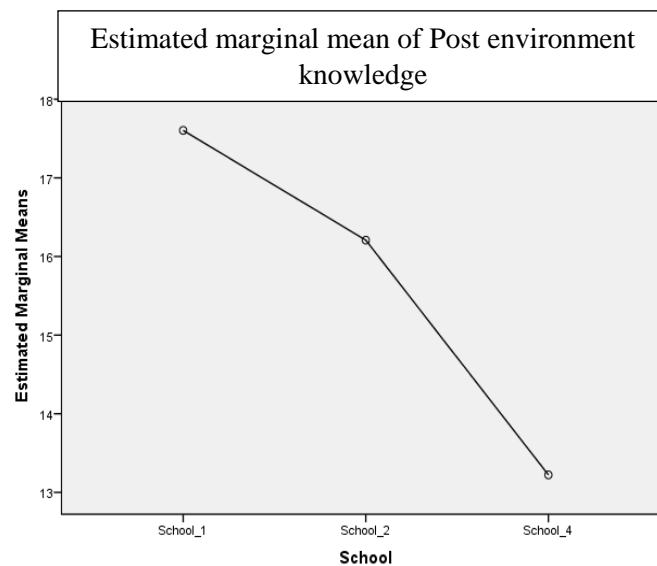
Chart: Estimated marginal mean of post environment responsible behaviour, concern for environment and environment knowledge

Estimated marginal mean of Post environment responsible behaviour

Covariates appearing in the model are evaluated at the following values: Env_Res_Beh = 56.44

Estimated marginal mean of Post Concern for Environment

Covariates appearing in the model are evaluated at the following values: Concern_for_Env = 48.10

Estimated marginal mean of Post environment knowledge

Covariates appearing in the model are evaluated at the following values: Knowledge = 13.44

The above charts show that the adjusted mean scores (at the posttest stage) of environment responsible behaviour, concern from environment and environment knowledge of students of school 1 intervened through whole house approach are more than the students of school-2 intervened through whole house approach. Hence, whole house approach has a better effect on

improving environment responsible behaviour, concern from environment and environment knowledge among students than strategic environment education.

Conclusion:

From the analysis, it is found that both 'strategic environment education' and 'whole house approach' have positive impact on environment responsible behavior, concern and knowledge of students. However, effect of 'whole house approach' on environment responsible behavior, concern and knowledge is better than the effect of 'strategic environment education'. Hence, parents'involvement in environment management may have effect on environment responsible behavior of children. In the current study, one to one motivational interview was conducted with parents. It may not be possible for the teachers to visit homes to motivate parents but class wise parents and students' group discussion may be conducted to motivate parents and students to carry out environment action. The current study involved only classroom session as the part of intervention with an intention to demonstrate schools having space issues to conduct environment sensitisation activities. Future studies may include out-door activity in strategic environment education to find out the effect on environment responsible behavior or may compare the effect of outdoor environment activity with current 'strategic environment education'.

References:

Asah, S.T., Bengston, D.N., Westphal, L.M. (2012). The influence of childhood: Operational Pathway to adulthood participation in nature based activities. Environment and Behavior. 44 (4). pp.545-569

Behera, J. &Samal, R. M. (2013). Pro-environment behaviour of secondary students: A topographical analysis. International Journal of science and research. 4 (5), pp. 698-703

Center for Disease Control and Prevention. (2012). Parents Engagement: Strategies to involve parents in School Health. *Department of Health and Human Services*. Atlanta, GA:U.S.

Chawla, L. (1988). Children's concern for the natural environment. *Children's Environments Quarterly*, 13-20.

Chawla, L., & Cushing, D. F. (2007). Education for strategic environmental behavior. *Environmental Education Research*, *13*(4), 437-452.

Davis, J. (1998). Young children, environmental education, and the future. *Early Childhood Education Journal*, *26*(2), 117-123.

Emerson, L., Fear, J., Fox, S., & Sanders, E. (2012). Parental Engagement in Learning and Schooling: Lessons from Research. *Family-School & Community Partnerships Bureau*. Australia

Gatersleben, B., Steg, L., Vlek, C. (2002). Measurement and determinants of environmentally significant consumer behavior. Environment and behavior. 34, 335-362 http://eab.sagepub.com

Hettema, J., Steele, J., & Miller, W. R. (2005). Motivational interviewing. *Annu. Rev. Clin. Psychol.*, *1*, 91-111.

Hines, J.M.; Hungerford, H.R.; Tomera, A.N. (1987). Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. Environment Education. Vol.18, pp.1-8

Krajhanzl, J. (2010) Environmental and Pro-environmental Behavior. *School and health.* 21, 251 -274

Kollmuss, A., &Agyeman, J. (2002). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? Environment Education Research. Vol. 8, No. 3, 239-260

Linden, S.V.(2015). Exploring Beliefs about bottled water and intentions to reduce consumption: the dual effect of social norm activation and persuasive information. Environment and Behaviour. 47(5), 526-550

Miller, W.R.; Rollnick, S. (2002). "Motivational Interviewing: Preparing People to Change". *Guilford press*

Palmberg, I.E., &Kuru.J (2000). Outdoor activity as a basis for environmnet responsibility. Journal of environmental education. 31 (4). 32-36

Pancer, S. M., & Pratt, M. W. (1999). Social and family determinants of community service involvement in Canadian youth. *Roots of civic identity: International perspectives on community service and activism in youth*, 32-55.

Saini, P. (2014). Environment awareness among deprived and non-deprived intermediate students of Agra city. *Journal of community guidance and research*. Vol. 31, No. 1, pp. 152-159

Siddiqui, T.Z. & Khan, A. (2015). Environment Education: An Indian Perspective. Research Journal of Chemical Sciences. 5 (1), pp.1-6

Sintov, N.D., Desario, G., & Prescott, C.A. (2010). Effectiveness of a competition based intervention in promoting pro-environmental behaviour in a university residential setting. ACEEE Summer study on energy efficiency buildings. pp. 322-336

Steg, L., &Vlek, C. (2009) Encouraging pro-environmental behavior: An integrative review and research agenda. *Journal of Environmental Psychology*. Elsevier. 29, 309-317

Strong, C. (1998). The impact of environmental education on children's knowledge and awareness of environmental concerns. *Marketing Intelligence & Planning*, *16*(6), 349-355.