

EFFECTIVENESS OF ALTERNATIVE ENVIRONMENTAL EDUCATION PROGRAM IN PROMOTING CONNECTEDNESS WITH NATURE AMONG SECONDARY SCHOOL STUDENTS OF GOA

¹Chittaranjandas V.Devulkar, ²Dr.Anna Neena George

¹Investigator, ²Research Guide

¹Ph.D. Scholar, Dr. Dada Vaidya College of Education, Ponda Goa

¹Graduate Science Teacher, Vivekananda Vidyalaya, Bori-Ponda Goa

²Principal-Acting, Dr. Dada Vaidya College of Education, Ponda Goa

Abstract

A Goan secondary school student today can name the planets of our solar system, draw a diagram of chloroplast, and recite the causes of air pollution. Yet, the same student playing a free fire or PUBG game on mobile under the shade of a well knitted natural canopy of green fronds of coconut doesn't know that the Konkani ecological terminology used for this leaf is "Molla". He is so much connected to screen that he is disconnected from nature and is unaware of the fact that the fallen cashew seeds under the cashew tree during summer sprouts up few days after "Mirgh" (Mrigh Nakshatra) monsoon to give us "Ghodhka" the soft, green -tender tasty cashew cotyledons which forms an traditional tasty monsoon recipe called ghodkachi xacuti on plates of majority of Goan's. This is the central paradox of modern environmental education in Goa. The emotional bond between people and nature has a curcial role in influencing their inclination to interact with natural environment (Hinds and P.(2008). A world famous biodiversity hot spot & tourist destination site where some nature loving tourist come only to study the endemism in Goa's wildlife like bird watching. The challenge for 2025 is not to add more data, but to forge a new relationship of connectedness with nature (CWN) and contribute to the emergence of a generation that does not just live in Goa, but feels, knows, and fights for its soul. Connectedness with nature is a stable state of consciousness comprising symbiotic cognitive, affective, and experiential traits that reflect, through consistent attitudes and behaviors, a sustained awareness of the interrelatedness between one's self and the rest of nature. CWN has been found as a reliable predictor and motivation for environmentally responsible behaviour (ERB). It is not a subject to be taught, but a latent sense to be *awakened*. It moves beyond assessing "alternative programs" to proposing a fundamental re-imagining of learning as an act of ecological belonging. The goal of environmental education is to develop a world population that is aware of, and concerned about the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively towards obtaining solutions for current problems and the prevention from forthcoming ones (UNESCO, 1976).

Keywords: Connectedness with Nature (CWN), Alternative Environmental Education Program(AEEP) , Responsible Environmental behaviour(REB),Environmental Literacy Test (ELT)

Current EE has failed to help young learner internalize "nature". Nature is something "out there" in the existing EE discourse. If ones notion of self-incorporate nature, any damage to nature is felt as harm to oneself (Roszak et al(1995).This sense of belonging may potentially function as a prerequisite for the formation of an affective bond with nature thus contributing to environmental protection. For positive environmentalism, we need to cultivate a new level of consciousness, associated with the principles of deep ecology among students (Miller, 1996) that focuses on understanding the interconnectedness of all life forms and the complexity of global ecosystem.Promoting connectedness with nature among school students in Goa is crucial due to the state's unique biodiversity and environmental challenges, such as coastal degradation and loss of natural habitats. Current environmental education approaches in Goa have limitations, including a lack of tailored programs for local contexts. An effective alternative environmental education program can potentially foster connectedness with nature among school students, contributing to the conservation of Goa's natural heritage. This study's novelty lies in its focus on an alternative program specifically designed for Goa's context. Furthermore, this research aligns with broader goals, such as SDG 4 (Quality Education) and Goa's environmental policies aimed at sustainable development.

Government of India has introduced the EE subject at formal school at all the levels of educational strata with the objective of creating environment sensitive and responsible citizens with change in attitude & skills to solve the local environmental problems. However, inspite of all these initiatives we are still facing the problems in

environmental education. Empirical evidence further substantiates the claim that only addressing knowledge in Inadequate. In generating behavioral changes (Bradley al. 1999), Manoli Johnson et al. 2007) experiential learning strategies in EE is the need of the hour. A.K. Liefländer et al.(2013), suggested that a positive human-nature relationship is essential for countering today's environmental problems. Research conducted over the past 3 decade (Orr 2004) suggest that environment awareness issues has a limited effect on ecological behavior. It turns act that awareness is an essential but secondary variable whose substantial impact is entirely mediated by emotions therefore environment behavior can only be shaped by environment knowledge that evokes environment emotions (Carmi et al. 2015). Collado et al. (2013) suggest that enjoyment and play may have a positive effect on nature connection in children. Bruni et al. (2017) found that only the activity in which children engaged artistically with the natural world, such as narrative writing, art work, and photography, created a positive shift in nature connection. Immersive experiences and free outdoor play were seen as a positive feature by Mullenbach et al. (2018) as well as Schneider and Schaal (2017). Research suggests that bonds to the natural world are often formed in childhood (Chawla 1998; Wells and Lekies 2006). Prior environmental education research has focused largely on knowledge or attitudinal outcomes, and few studies have examined the ability of environmental education programmes to promote connectedness with nature. For school based environmental education programmes, It has been suggested that a positive human-nature relationship is essential for countering today's environmental problems. Prior environmental education research has focused largely on knowledge or attitudinal outcomes, and few studies have examined the ability of environmental education programmes to promote connectedness with nature. For school based environmental education programmes, Milbrath (1994, p. 278) recommends integrating both the cognitive aspects and affective direct experiences with nature. This integration 'will be a blessing for life' as it helps pupils to bond with nature. Feeling connected with nature is linked to pro-environmental actions and is a strong motivation for protecting nature, which makes the investigation of connectedness to nature important (Frantz et al. 2005; Kals, Schumacher, and Montada 1999; Kaiser, Roczen, and Bogner 2008). Bruni and Schultz (2010) showed that children between the ages of 10 and 11 are highly connected with nature, just as high as environmental activists. College pupils, however, showed less connection with nature, which they interpreted as a loss of connection to nature in some children from childhood to adulthood. Schultz and Tabanico (2007) have developed the Implicit Association Test (IAT) to measure the tendency to associate self with the environment. They investigated the effect of a one-day outing on visitors to a wild-animal park and found an increase in connectedness with nature, even after such a short stay. Studies with adults have also shown that spending time in a natural environment increases connectedness to nature and hence, positive experience in and with nature seems to increase connectedness. A similar study is being carried out by Zylstra et al.(2014) on Connectedness as a core conservation concern, in this studies the researcher highlights the importance of CWN as a reliable predictor and motivation for environmentally responsible behavior (ERB). In recent times several studies Promoting connectedness with Nature related to correlational and theoretical type, have explored the human-nature relationship (e.g. Frantz et al. 2005; Schultz and Tabanico 2007; Davis, Green, and Reed 2009; Brügger, Kaiser, and Roczen 2010).

Present research study focuses on the practical influence of environmental education on connectedness with nature by utilising 10-11 years age group (Class VII) of students from Goa. In India, Very few studies are being carried out on Effectiveness of connectedness with Nature (CWN) as a core environment conservation construct hence the researcher has carried out the research on the topic Effectiveness of Alternative Environmental program (AEEP) in promoting connectedness with nature among secondary school students of Goa. AEEP is a systematic, sequential, stepwise Environmental education program consisting of small duration(2-3hrs), Medium duration(1 day) & High duration(2-3 weeks) Multi-sensory activities conducted with secondary school students of 7th Class in an indoor and outdoor setup which gives them the opportunity to have direct contact with nature, experience the nature & being with nature and reflect on the meaning of what they have experience by infusing the concept of Connectedness with Nature (CWN) which is a multidimensional stable state of consciousness comprising symbiotic cognitive, affective, and experiential traits that reflect, through consistent attitudes and behaviours, in a sustained awareness of the interrelatedness between one's self and the rest of nature which comprises of information about nature; experience in nature; and committed connectedness with nature. In this Program students will be allowed to inculcate the knowledge of environment, Understand and get aware about the environment by developing attitude and skills through environment so as to develop responsible Environmental behaviour for taking positive action (Action competence) for preservation & conservation of environment around him and community as a whole. Eventually, Here the students will take the Education about the Environment by means of indoor activities(Theory), Education through the Environment by experiencing (Outdoor activities), Education for the Environment by taking action by

performing following various complex Indoor as well as outdoor environmental activities using their all senses (Cognitive, affective & psychomotor domain)

Broad Research Objectives

- 1) To design and develop Alternative environmental Education Program (AEEP) by identifying suitable environmental activity and pedagogical practices for teaching selected concepts in Environmental education from the prescribed course of study at grade VII .
- 2) To study the effectiveness of the AEE Program in promoting connectedness with nature on the grade VII students in Environmental education(EE)
- 3) To compare the effectiveness of AEE program strategies and conventional method of teaching EE on connectedness with nature of grade VII students.
- 4) To compare & find the differences in connectedness with nature w. r. t. gender.
- 5) To compare & find out the impact low duration (2-3 hrs), medium duration (one day) and long duration (3-weeks) environment activities on VII std.school students of Goa.

Objectives of Alternative Environmental Education Program:

- 1) Promote Environmental Awareness: Increase students understanding of environmental issues.
- 2) Foster connection with nature: Encourage students to develop a sense of connection with the natural world.
- 3) Develop critical Thinking: Encourage critical thinking and problem solving skill related to environmental issues.
- 4) Inspire environmental stewardship: Inspire students' to take action in protecting environment.
- 5) Improve environmental literacy: Enhance students' knowledge and understanding of environmental concepts.
- 6) Encourage sustainable practices: Promote sustainable practices and behavior among students

Methodology and Strategies used in AEEP:

The different activities selected for the students in AEE program will be developed & implemented with the help of students according to the local socio-economic environmental problems that the students would like to address through their actions. All the activities would be realistic based on concrete situations allowing the students to develop and apply their knowledge to a given situation and the problems they consider socially relevant. To achieve the learning outcomes listed in the AEE program some active, socio-constructivist & student centered methodologies and strategies would be applied combined in a pedagogical model to maximize its effectiveness as follows: Collaborative learning, Play based learning, critical inquiry learning, community oriented learning, Contemplative learning, outdoor nature based learning, and socio emotional learning. This model has potential to develop in students the ability to think critically make informed & conscious decision & enhance active participation leading to changes in society related socio environmental problems so as to develop responsible environmental behavior and connectedness to nature. Hands on activities like field trips, nature walk and experimentation in outdoor setup to connect with nature to witness the appreciation and curiosity about nature. They learn to observe, listen, smell and touch the nature developing a deep connection & empathy for the living organism & ecosystem around. Students can use apps like Merlin bird ID (for bird song identification) or simply observe & sketch what they see. Use of storytelling on construction of nest by birds or construction of houses of wild animals and narrative. Use of reflection by using reflective journal and self-assessment. After every activity this will facilitate discussion among children about what they learned, what surprised them and how they can apply these lessons to their daily lives. Community engagement and collaboration by involving students in community based projects that addresses environmental. Issues such as conservation, sustainability and environmental Justice.

Expected outcomes from students in the form of change in attitude/ responsible environment behavior after AEE Program intervention:

While designing the various activities in AEE program in teaching the concepts of Local biodiversity conservation, Garbage management, water conservation, Energy conservation are taken in to consideration. Students at the end of the program will be able to: Reuse, Recycle & Reduce concept (3R's of waste management), (Buy Reusable instead of disposable materials), Use homemade food. Buy traditional, local organic food & avoid Junk food. Prefer walking to school or use Bicycle(Good Health), Turn off lights & fans when not in use at home & school(Save Energy), Use energy saving devices like CFL bulb in school & at home (Energy conservation), Use Organic Manure in gardening practice & Avoid Pesticides, fertilizers while Gardening in school & at home(Healthy Food practices), Prepare your own compost in kitchen garden in school & at home (Recycling), Use water Judiciously at home & while in school (Water conservation), Growing indigenous, local vegetables & medicinal plants at home & in school.(Local Biodiversity conservation) , 10) Exhibition of Local Indigenous Plants in collaboration with local panchayat, Preparing & using a bird bath & animal feeder at home & school, Keep our surrounding neat & clean (school & at home), Use water harvesting technique in school & at home, Identifying Local environmental

Research Method And Design of the Study:

The method adopted for the present study would be true experimental method with Pre-test, post -test and single equivalent group design. In the first step the investigator will administer pre-test for the experimental and control group followed by post-test on experimental and control group.

Population, Sample & sampling methods used for the study:

A population is any collection of specified groups of human beings or non-human entities such as objects, educational institutions, time units, geographical areas etc. The population of the present study refers to ten Secondary school students of Dharbandoda taluka of Goa. Samples are representative group of population under study. Sampling is a process by which a relatively small number of individuals or events are selected and analyzed in order to find out connectedness with nature from the entire population or universe from which it was selected. The investigator selected VII class students of ten secondary schools of Dharbandoda taluka of Goa. The experimental group and control group will have 25 students each. For conducting Pilot study of 25 students from a school in Dharbandoda was selected by using Simple random sampling whereas for tryout of 100 students cluster sampling by selecting four schools of Dharbandoda was used. To design & develop activities for AEEP Simple random sampling was used.

Tool & Statistical techniques used for the study: The researcher designed & developed an Environmental literacy test (ELT) as a tool to find the connectedness of VII std. students with nature and Descriptive statistical techniques like Mean, Median, mode, standard deviation, skewness and kurtosis were used and Inferential statistic techniques like paired t-test, and Analysis of Variance (ANOVA), were used for analysis of data.

References

1. K. Liefländer et al.(2013), Promoting connectedness with nature through EE
2. Ajzen, I. (1985). From intention to actions: A theory of planned behaviour
3. Allen, J., & Ferrand, J. (1999). Environmental locus of control, sympathy, and pro-environmental behavior. *Environment and Behavior*, 31, 338-353.
4. Barrett, M. J. (2008). Participatory pedagogy in environmental education: Reproduction or disruption? (pp. 212- 224). Springer Netherlands.
5. Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.
6. Bradley, J., Waliczek, T., & Zajicek, J. (1999). Relationship between environmental knowledge and environmental attitude of high school students. *Journal of Environmental Education*, 30, 17-22.
7. Chawla, L. (1998). Significant life experiences revisited: A review of research on sources of environmental sensitivity. *Journal of Environmental Education*, 29, 11-21.
8. Chawla, L. (2007). Childhood experiences associated with care for the natural world: A theoretical framework for empirical results. *Children, Youth and Environments*, 17, 144-170.
9. Chawla, L., & Cushing, D. (2007). Education for strategic environmental behavior. *Environmental Education Research*, 13, 437-452.)Centre for Environmental Education. (2010). School EE in India. Retrieved from <http://www.greenteacher.org/page63>, Google Scholar
10. Chhokar, K. B. (2010). Higher education and curriculum innovation for sustainable development in India. *International Journal of Sustainability in Higher Education*, 11(2), 141–152.

11. Davis, B., Rea, T., & Waite, S. (2006). The special nature of outdoors: Its contribution to the education of children at aged 3-11. *Australian Journal of Outdoor Education*, 10, 3-12.
12. Geller, E. (1995). Actively caring for the environment: An integration of behaviourism and humanism. *Environment and Behavior*, 27, 184-195.
13. Gabby Salazar tal (2020). Practitioner guide to assessing connection to Nature: Washington DC: North American Association for Environmental education
14. Genc, M., (2014). The project-based learning approach in environmental education. *International Research in Geographical and Environmental Education*. 24(2), 105-
15. Gosling, E., & Williams, K. J. (2010). Connectedness to nature, place attachment and conservation behaviour: Testing connectedness theory among farmers. *Journal of Environmental Psychology*,
16. Greg R. Lankenau, (2018). Fostering connectedness to nature in higher education, *Environmental education Research*, DOI.10.1080/135046222016.1225674
17. Hungerford, H., & Volk, T. (1990). Changing learner behavior through environmental education. *Journal of Environmental Education*, 21, 8-21.
18. Ilga Salite, (1998). An Ecocentric Paradigm: An Important Tool for Teachers of Environmental Education, *Australian Journal of Environmental Education* / Volume 14 / Cambridge University Press: 23 June 2015, pp. 81-85
19. Jain S, Raghunathan M. (2001) Towards Incorporating Major Environmental Concepts into Science Education in South Asia.
20. Khirwadkar A. & Pushpanadam, K. (2007). Education for Sustainable Development: Implications for Teacher Education. *International Forum of Teaching and Studies*, 3(3), 5-13. Google Scholar
21. Kals, E., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior*, 31, 178-202.
22. Louv, R. (2005). *Last child in the woods*. Chapel Hill, NC: Algonquin Books.
23. Peterson, N. (1982). Developmental variables affecting environmental sensitivity in professional environmental educators. Unpublished master's thesis, Southern Illinois University, Carbondale.
24. & Evans, G. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior*, 35, 311-330. at UNIV OF FLORIDA Smathers Libraries on January 19, 2012 Stephan Mayer & Cynthia M. Frantz (2004), Connectedness to Nature Scale
25. Mayer F. S. & Frantz C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of environmental Psychology*, 24 (4), 503-15.
26. Ministry of Environment. Annual Report 2013-14. Environmental Information System, (2015), Government of India, New Delhi, India.
27. M. Walsh, (2015). Environmental education: a decade of failure but some hope for the future, *Australian Journal of Environmental Education* / Volume 1 / Issue 1 / July 1984, Published online by Cambridge University Press: 23 June 2015, pp. 21-24
28. National Council of Teacher Educators. (2005). *Environmental Education Curriculum Framework for Teachers and Teacher Educators*. New Delhi, India: NCTE. Google Scholar
29. Navarro O & et al, (2017). "Connectedness to Nature Scale": Validity and reliability in the French context. *Frontiers in Psychology*, 8, 2180.
30. Pandya, M. (2000). Teacher Education for Environmental Education in India. Paper presented at the Third UNESCO Japan Seminar on EE in Asia Pacific Region. Tokyo, Japan. Google Scholar
31. Rabindranath, M. J. (2007). Environmental education in teacher education in India: experiences and challenges in the United Nation's Decade of Education for Sustainable Development. *Journal of Education for Teaching: International research and pedagogy*, 33(2), 191-206. CrossRef Google Scholar Rayelynn Brandl, Arlene Alvarado, Abigail Peltomaa, (2019). Evaluating efficacy of environmental education programming, first published: 23 January 2019
32. Sarabhai, K. (1995). Strategy for Environmental Education: An Approach for India. Paper presented at the North American Association for Environmental Education. Google
33. Song, Y. I. K., (2010). Crossroads of public art, nature, and environmental education. *Environmental Education Research*. 18 (6), 797- 13. <https://doi.org/10.1080/13504622.2012.670208>
34. Sonowal C.J. (2009) Environmental Education in Schools: The Indian Scenario. *J Hum Ecol.*; 28(1):15-36.
35. Schultz, W. (2000). Empathizing with nature: The effects of perspective taking on concern for environmental issues. *Journal of Social Issues*, 56, 391-406.
36. Schultz, W. (2002). Inclusion with nature: The psychology of human-nature relations. In P. Schmuck & W. P. Schultz (Eds.), *Psychology of sustainable development*
37. Theodori, G., Luloff, A., & Willits, F. (1998). The association of outdoor recreation and environmental concern: Reexamining the Dunlap-Heffernan thesis. *Rural Sociology*, 63, 94-108.
38. UNESCO. (2007). The UN Decade of Education for Sustainable Development (DESD 2005-2014). United Nations of educational, scientific and cultural organization, France; 2007.
39. Wells, N. (2000). At home with nature: Effects of "Greenness" on children's cognitive functioning. *Environment and Behavior*, 32, 775-795. Wells, N
40. Zylstra M.J., & Et al, (2014). Connectedness as a core conservation concern: An interdisciplinary review of theory and a call for practice. *Springer Science Reviews*, 2(1), 119-143. <https://doi.org/10.1007/s40362-014-0021-3>