

Effect of Eco-Pedagogy on the sensitivity of Teacher Trainees towards Biodiversity Conservation

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Abstract

The key role of the teacher in EE is to foster environment friendly attitudes, values and appreciation of nature, inculcate a deep conviction to protect and conserve environment. This study is carried out to find the effect on the outlook of the teacher trainees, by doing EE projects, on the biodiversity of Goa. It will provide an insight into, whether EE is having impact on the teacher trainees and what kind of pedagogy would help in making EE achieve the same. The study becomes even more imperative because Goa is immensely rich with biodiversity and it is not incorporated into the EE syllabus. The lack of research studies in India in the field of EE and most of them tended to be mainly quantitative, revealing a wide gap in qualitative research studies (Almeida & Cutter-Mackenzi,2011). The study is to sensitize teacher trainees about the biodiversity (terrestrial and aquatic) of Goa and to equip teacher trainees to document local specific biodiversity. The study used field trips, interviews and viewing documentaries as a means of exposing teacher trainees to Goa's biodiversity. The data was collected from quiz, journal entries and interviews.

Keywords: *teacher education, biodiversity sensitivity, environment education projects*

Introduction

India's commitment towards environment conservation and protection is evident , from the Indian Constitutional provision,

Article 51-A (g) expects every citizen of India to “protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.”

and the Supreme Court of India's 2003 ruling to make environment education, as a compulsory subject at all levels of education .The subsequent changes in the National Curriculum Framework (2005) and the National Council for Teacher Education, new curriculum for teacher educators has included EE as a compulsory subject at all levels of teacher education, establishes the importance of EE. National Curriculum Framework(NCF), Section 3.9 is devoted entirely to Habitat and Learning, acknowledges that formal education has become largely alienated from the students "habitats", which in turn implies that the current education system is far removed from the current lifestyles of students.

The key role of the teacher in EE is to foster environment friendly attitudes, values and appreciation of nature , inculcate a deep conviction to protect and conserve environment. Participation and involvement in environmental activities and awareness about environment through activities are integral part of EE. The expectations from the teacher, in achieving the aims of EE, is enormous. Environment Education a compulsory subject, for the two year B.Ed. programme in Goa. The author, as a teacher educator for Environment Education, assigned several projects to the teacher trainees of second year B.Ed. The field based projects connect the trainees to their environment and exposes them to the rich biodiversity and the hazards ,to the fragile ecosystems in Goa, due to rampant haphazard developmental projects. Goa being in the Western Ghats , which is one of the seven hotspots of the world,is affected severely by developmental projects catering to tourism and industries.

Rationale for the study

The concern for investigating the effectiveness of EE on teacher education has been reiterated by several researchers, though EE has been incorporated into teacher education at all levels as a compulsory subject since 2005. It has been noted by several researchers, (Almeida, & Cutter-Mackenzie, ,2011),Narlanka (2017), that EE has become yet another subject devoid of any personal involvement or experiential learning, to encourage students to find personal reasons to conserve their environment. It is regretful that not much research has been done to find the effectiveness of EE on teacher trainees, the perceptions and experiences of teacher educators though teachers and teacher education has been recognized as the vital element in the successful implementation of EE (Almeida & Cutter-Mackenzie ,2011). Teachers are recognized by all apex bodies, as responsible for inculcating the desirable values and skills in the future generations to protect and conserve the environment. The lack of research studies in India in the field of environmental education and most of them tended to be mainly quantitative, revealing a wide gap in qualitative research studies(Almeida & Cutter-Mackenzie ,2011). This study is carried out to find the effect on the outlook of the teacher trainees, by doing EE projects, on biodiversity of Goa. It will provide an insight into, whether EE is having impact on the teacher trainees and what kind of pedagogy would help in making EE achieve the same. The study becomes even more imperative because Goa is immensely rich with biodiversity and it is not incorporated into the EE syllabus. India's diverse environment makes it particularly "difficult" and "fragile" as each region poses a different kind of challenge in terms of the environmental issues it raises (Joshi, 2005). This iterates the need to know one's own local specific environment in order to protect and conserve it. According to Narlanka (2017) the environment science classes should allow the students in creating a personal association with their environment and internalize the problems surrounding them. This can be done by sensitizing and educating the teacher trainees through EE. They can inspire and equip the future citizens to protect and conserve the fast depleting biodiversity.

Objectives of the study

1. To sensitize teacher trainees about the biodiversity (terrestrial and aquatic) of Goa.
2. To equip teacher trainees to document local specific biodiversity.

3. To find whether there exists any significant difference in boys and girls in the score of sensitivity towards biodiversity.
4. To find whether there exists any significant difference among boys and girls in their knowledge about local-specific biodiversity.
5. To find whether there exists any significant difference in rural and urban trainees in the score of sensitivity towards biodiversity.
6. To find whether there exists any significant difference among rural and urban trainees in their knowledge about local-specific biodiversity.

Hypothesis

H₀1. There is no significant difference among boys and girls in the score of sensitivity towards biodiversity.

H₀2. There is no significant difference among boys and girls in their knowledge about local-specific biodiversity.

H₀3. There is no significant difference in rural and urban trainees in the score of sensitivity towards biodiversity.

H₀4. There is no significant difference in rural and urban trainees in their knowledge about local-specific biodiversity.

Methodology of the study

This is a mixed method research. Qualitative and quantitative methods have been employed.

Sample

The sample for the study, were fifty teacher trainees from the second year of B.Ed.programme batch, chosen at random, to do the study on biodiversity of Goa as their Environment Education project. The sample consisted of thirty five girls and fifteen boys. There were twenty eight rural and twenty two urban teacher trainees.

Procedure of the study

First month

The trainees were given elaborate orientation about the project its objectives and modus operandi. They were also oriented about the data gathering tools, interview techniques and data analysis.

The teacher trainees were exposed to different film shows regarding Western Ghats biodiversity, Goa's rich ecosystems, biodiversity hotspots of Goa, in the college itself. The following films were shown.

<https://youtu.be/7uPBKxODEh0>

<https://youtu.be/mvOCeV8GMYc>

<https://youtu.be/pkk0tk5WUtA>

<https://www.youtube.com/watch?v=b7daXv1k7b8>

<https://www.youtube.com/watch?v=ZsaZkx6HYs0>

Second month: The trainees are given the different locations they were supposed to visit, in the second month, according to their place of residence. The necessary permissions are procured beforehand.

Field visits : Two biodiversity hotspots of Goa, Bhagwan Mahavir wildlife sanctuary/Cotigao wildlife sanctuary, walk along the beach (Benaulim/ Miramar)

Third month

Field visits : the mangrove forests (Chorao island/ Divar island) ,rice fields (Curtorim/ Madkai),khazan lands(Rachol/ Rasai)

Fourth Month

Trainees were provided opportunity to interact with farmers, researchers, local biodiversity cell members, environment experts in the state at different locations depending on their place of residence.

Tools (constructed by the investigator)

1. Quiz
2. Interview schedule (2)
3. Observation schedule for field visits
4. Journal entry format

The quiz of twenty four items, was constructed and send to experts for verification of the questions.

The quiz was administered to identify the following among the trainees:

1. Able to identify the terrestrial flora and fauna
2. Able to give accurate data of the local specific biodiversity
3. Able to differentiate between terrestrial flora and aquatic flora
4. Able to identify the aquatic ecosystem interdependence
5. Able to identify the aquatic flora and fauna
6. Able to detect the threat to biodiversity due to human activities

Interview schedule for the trainees to take interviews of experts and authorities was also constructed. Another semi-structured interview schedule to take interview of the trainees was

also constructed keeping in view, the following, based on the field visits and interaction with the experts:

1. Able to report the location of different trees and plants
2. Able to describe the location as thick/sparse vegetation
3. Able to identify and describe the topography
4. Able to report the interdependence found on trees, near ponds, fields
5. Able to detect the threat to biodiversity due to human activities
6. Able to describe the unique flora and fauna found in different locations

Data gathering: A written quiz of twenty four items was made, based on the biodiversity of Goa, to find the sensitivity towards biodiversity. It was administered at the end of the first month. For all the field visits, the trainees were given a format to document in their observations, regarding, places, persons, facts. They also employed the interview schedule to get information from concerned persons. Apart from this, they were asked to write their own observations and experiences in their journals using the format. Triangulation method (quiz, interviews, journal entries)was used.

Data analysis

The data analysis of the study was carried out quantitatively with the help of descriptive statistics, Mean, SD and inferential statistics t test on the scores of the quiz.. Interview was conducted using a semi-structured interview schedule. The journal entries and interview statements were analysed and coded. The data from the interview revealed several common statements. The journal entries also rendered certain common elements.

Analysis and interpretation based on gender

Objective 3: To find whether there exists any significant difference between boys and girls in the score of sensitivity towards biodiversity.

Table 1

Difference between boys and girls with respect to sensitivity to biodiversity

Area of concern	Gender	N	Mean	SD	t-value
Sensitivity to biodiversity	Boys	15	67.8	12.336	1.7939
	Girls	35	79.6	7.956	

Table 1 describes the mean scores and t-value of the sensitivity towards biodiversity between boys and girls based on the quiz. The table displays that there is no significant difference between sensitivity towards biodiversity of boys and girls as the calculated t value is 1.7939 and the result is not significant at ($p > .05$). Therefore, H_0 is accepted.

Objective 4: To find whether there exists any significant difference between boys and girls in their knowledge about local-specific biodiversity.

Table 2

Difference between boys and girls in their knowledge about local-specific biodiversity

Area of concern	Gender	N	Mean	SD	t-value
Local-specific biodiversity	Boys	15	78.6	17.3723	0.978597
	Girls	35	69.8	10.2330	

Table 2 describes the mean scores and t-value of their knowledge about local-specific biodiversity between boys and girls based on the quiz. The table displays that there is no significant difference in their knowledge about local-specific biodiversity between boys and girls as the calculated t value is 0.978597 ; ($p > .05$). Therefore, H_02 is accepted.

Analysis and interpretation based on place of residence

Objective 5. To find whether there exists any significant difference between rural and urban students the score of sensitivity towards biodiversity.

Table 3

Difference between rural and urban with respect to sensitivity to biodiversity

Area of concern	Place of residence	N	Mean	SD	t-value
Sensitivity to biodiversity	Rural	28	81.6	4.5055	3.2081
	Urban	22	68.6	7.8612	

Table 3 describes the mean score and t-value of the sensitivity towards biodiversity between rural and urban based on the quiz. The table displays that there is significant difference between sensitivity towards biodiversity between rural and urban as the calculated t value is 3.2081; ($p < .05$). Therefore, H_03 is rejected.

Objective 6. To find whether there exists any significant difference between rural and urban students in their knowledge about local-specific biodiversity.

Table 4

Difference between rural and urban in their knowledge about local-specific biodiversity

Area of concern	Place of residence	N	Mean	SD	t-value
Local-specific biodiversity	Rural	28	75.8	8.0436	4.1311
	Urban	22	56.6	6.5802	

Table 4 describes the mean scores and t-value of their knowledge about local-specific biodiversity between rural and urban based on the quiz. The table displays that there is significant difference in their knowledge about local-specific biodiversity between rural and urban as the calculated t value is 4.1311 ; ($p < .05$). Therefore, H_0 is rejected.

The analysis of the interview of the trainees revealed these common conclusions:

1. The link between local environmental problems and the haphazard developmental activities were not known to them.
2. The teacher trainees were alarmed at the biodiversity loss in their own locality and were overly saddened by the apathy.
3. The trainees were not aware of the rich biodiversity around them though, they had lot of general information about the environment, eco-systems and threats to environment.
4. The trainees confessed that the interaction with experts created lot of interest about environmental concerns in them and they would like to work with them.
5. The experiences of interaction and field visits had made an ineradicable mark on the teacher trainees which they said would not have come from seeing digitally.
6. The importance of the various plants in their own locality was revealed to them through field visits and interaction with the experts.
7. The trainees were not aware of the severity of the damage done to the biodiversity by the developmental activities in the state.
8. They confessed that caring for the biodiversity was of supreme importance.
9. The field visits helped them to know about the unique biodiversity in different places.
10. The trainees iterated they would create awareness about the threats to biodiversity in their locality.

The analysis of the journal entries

The journal entries were analysed and categorized. The common statements are given below.

1. I was astonished to see the amount of vegetation on the beach which I never noticed much earlier. I was not aware of their role in beach sand conservation.
2. The information about mangroves really blew my mind. I had thought of it as submerged land. They didn't look particularly attractive. It was surprising to hear from the experts about their vital role.
3. The number of trees,climbers,birds,animals I saw in the sanctuary was amazing. I never knew about them,never looked at them carefully and never bothered to know their names and uniqueness. The guided tour of the sanctuary was priceless.
4. I will take my students to the places I visited when I become a teacher.
5. I will take care of my garden and farm.
6. I will try to persuade my locality to keep the pond and waste land, clean.
7. I will encourage my friends to document the birds in their surroundings.

Discussion

Sensitivity to biodiversity and gender: It is clear from the result of objective 3 that there is no significant difference between the boys and girls on sensitivity to biodiversity. This indicates that the gender does not play a role on sensitivity to biodiversity .

Knowledge about local-specific biodiversity and gender: It is clear from the result of objective 4 that there is no significant difference between the boys and girls on sensitivity to biodiversity. This indicates that the gender does not play a role on knowledge about local-specific biodiversity.

Sensitivity to biodiversity and place of residence: It is clear from the result of objective 5 that there is significant difference between the rural and urban trainees on sensitivity to biodiversity. This indicates that the place of residence plays a vital role on sensitivity to biodiversity. It could be their proximity to surrounding flora and fauna in rural locale, that gives more sensitivity to biodiversity in terms of familiarity with terrestrial and aquatic flora and fauna.

Knowledge about local-specific biodiversity and place of residence: It is clear from the result of objective 6 that there is significant difference between rural and urban trainees on their knowledge about local-specific biodiversity. It indicate that they have developed the acumen and skill to identify plants, topography, interdependence in an ecosystem by repeated observation than from books or formal education. The rural trainees experienced the link between human activity and threat to biodiversity in their own village/farm.

Effects based on interviews and journal entries:The interviews revealed that the objective 1,2 were achieved to a large extent by the various activities. It reveals the conviction the trainees had after interacting with several experts, of the urgent need to conserve the biodiversity in their immediate surroundings. The trainees were convinced about the need to visit places rather than read about them or see documentaries. The journal entries give several confessions about their ignorance and indifference. The journal entries also reveal the change in their approach towards biodiversity conservation. The journal entries expose the desire to act towards biodiversity conservation of Goa. The field visits made a strong impact to sensitize the teacher trainees towards the fragile and unique ecosystems of Goa. The subject of EE now, seems to be more real and attracting attention of the trainees, than formal education through lectures.

Recommendations

1. There is need for several researches to be undertaken, on the implementation of the EE syllabi in various teacher education institutions in India.
2. There is need for several researches to be undertaken, on the implementation of the EE syllabi in various regions of India.
3. EE syllabus must include study of local specific ecosystems, biodiversity and region/area specific challenges to environment conservation.
4. There is an urgent need to make EE assessment, more based on project work and presentation rather than memory based exam.

5. The EE syllabi needs to include more cases studies of success stories of conservation by local people of the region along with much acclaimed national and international conservation success stories.
6. There is need to involve the teacher trainees to design activities for school children inculcate biodiversity conservation skills and attitudes.

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