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Biodiversity Conservation Education: An evaluation of Effects on Students' Knowledge, Perception and Attitudes

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Abstract

The unsustainable exploitation of biodiversity by humanity has lead many of the earth's natural resources to the brink of collapse. In order to reverse this trend, conservation educationist should reduce biodiversity illiteracy among the society, especially younger generation. Students are the future generation of the world. To evaluate the knowledge and attitude of the school students in biodiversity, various analysis and awareness was carried out. In our contribution, we focused on finding the differences between primary school students' attitudes towards biodiversity between their demographic variables such as gender, class level, family type, type of school and family income. The sample consists of 814 students from 10 schools. Students of grades 7^{th}, 8^{th} and 9^{th} were analysed. Data were evaluated with factor analysis and SPSS. The study emphasizes on the necessity to impart education for students regarding biodiversity. According to the results of the analysis of students' point of attitude towards biodiversity, in terms of variables; a significant differences were found in favour of students, female students, and students in joined family and parent's education status.

INTRODUCTION

Biodiversity is defined as the variety of living organisms including their genes, all species and the ecosystems that they inhabit (Cunningham & Cunningham, 2008; Enger & Smith, 2008). The concept has more relevance with regard to the sustainable use of natural resources and is often linked with conservation approaches, often wielding from conservation biology to social, economic and political issues (Perlman and Adelson, 1997). One aspect of biodiversity that has been neglected and is becoming increasingly important is anthropogenic cultural diversity and its dependence on natural habitats. Child stage is very important for life. Lifelong knowledge starts from this stage. The whole life learning also depends on this period. Education about conservation has a strong influence on the extent to which student

become committed to arguments for conserving species and habitats (Tim Caro, 2003). This depends on the successful implementation of educational program. Biodiversity conservation education is vital for the society to conserve the nature. This can be achieved, when the special groups (school children) are been targeted in the earlier stage.

We can understand the importance of biodiversity in terms of the services living organisms provide (Chavas, 2008). At the same time, we are aware of and are part of the forces that threaten global biodiversity (habitat destruction and disturbance, invasive species, pollution, human population growth, over-harvesting, commercial collections, and predator and pest control) (Cunningham, 2008). Modern man with his thirst and hunger for economic growth and blinded by science and technology has strayed from a life of coexistence with nature. The importance of education and awareness of biodiversity in sustaining life on earth is now even more crucial with the current levels of species extinction. Only when the seed of biodiversity conservation and the importance of conservation strategizes are been ploughed in their mind in the earlier stage of life, biodiversity will be protected from the verge of destruction. By implementing biodiversity conservation education from the early stage of school education practically and theoretically, an excellent outcome can be achieved. The present study gives emphasize on the students attitude of biodiversity education and whether they are interested in outdoor activities inside the school campus. To know the students attitude in biodiversity and the difference of attitude of conservation education based on the gender, family type, school type, kind of environment they dwell and parents education level. Without the educational component, conservationist will not be successful in lobbying for change in students perception.

1.1. Purpose of the Study

The present study aims to investigate the effects of students' demographical features such as school students' gender, grade level and income level of their family on students' attitudes towards biodiversity.

METHODS

2.1. Model of the Study

The study is a survey method looking at whether there are differences in students' attitudes towards biodiversity conservation based on gender, income level of the family, education status of the parents, family type, and type of School and socio-economic status of the school.

2.2. Participants

The universe of the study consists of the students attending the schools in the province of vadavalli, Coimbatore, India, were considered. 10 schools were selected around Bharathiar University as the study site. In the study, the locations, economic situations of the school and families were considered. The sampling of the study consists of 814 7th , 8th and 9th grade students attending 10 different schools with differing socio-economic status were analysed.

2.3 Data Analysis

The data obtained in this way were analyzed through SPSS 16 program package. According to the analysis results, the students' scores were found to be normally distributed. In this regard, "Independent t-test" was carried out to determine the impact of gender on students' attitudes towards science, and "One Way ANOVA" was employed to find the effects of grade level, income level of the family and socio-economic level of the school on the attitudes.

RESULTS:

We surveyed 814 children in Coimbatore district, Tamil Nadu, India. Ages ranged from 13 to 14 years and sex-ratio seemed to be slightly skewed towards males in the sample taken. Responses were analysed using SPSS program package. The students were composed of 59.8% private and 40.2% government school. Gender showed 45.1% male and 54.9% female. Family type comprised of 53.9% Nuclear and 46.1% Joined. Educational level of the parents among the students showed that 39.3% parents were graduate and above and 60.7% were schooling and literates. Family income of the students showed that 69.5% had an income

above 10,000 and 30.5% below 10,000 p.m. Area of the students were they dwell showed that 50.2% were from urban and 49.8% were from rural area.

The questionnaires filled by the students were calculated by the total responses given for the total questions and the details are presented in the Table 1. Special instructions regarding the conservation of biodiversity and the basic responsibility of the students to conserve biodiversity were requested to do and not to do and there was good response from the students. An explicit responds were got from them, when the interactive section and games regarding conservation of biodiversity were conducted outside the class room. It is incumbent upon conservation biologists as educators, to take advantage of the unique factors in promoting conservation education among the students. There were some students who argued regarding the term "biodiversity", that it includes only flora or fauna or global warming. They were not much aware of the term Biodiversity. During the ongoing awareness program, the term "poaching", "endangered species" were discussed with the students; most of the government students didn't have much knowledge about the term. The knowledge, attitude and perception about biodiversity conservation of students were analysed and they have merger understanding, due to lack of awareness via public, media etc. Only if the knowledge about biodiversity and their interconnection with the human and the interrelation of biodiversity can help the students group to recognize the importance for them and for the upcoming generation. The attitude of the students were analysed by various questions shown in table 1. Throwing the wastes from the moving vehicles was also not advised and the students responded in a well manner. Most of the people had the habit of throwing the wastes on the road sides and this was strictly advised and the students realized their actions and assured their obedience towards the nature. We advised the students not to keep articles made from animal skin, fur, horns etc that are available free of cost. During the progress of the program, pamphlets, short story books regarding biodiversity conservation, posters of various endangered and threatened species were showed and explained their importance for the nature. The perception of the students was not satisfactory due to the lack of awareness.

Pledge was made to acknowledge by the students to know the significance of biodiversity conservation. Teachers recommended for conducting such awareness camp habitually for students to plant trees and conserve biodiversity within their school premises so that they may know the implication of the diminution of biodiversity in future and they will initiate to commence from school students to the public, which may be awfully effective.

Discussion:

The results indicate students groups have to get engaged in nature activities, so that they get explicit awareness about inter –relationship and interconnection about humans and biodiversity. Despite whatever is the loom considered, conservation has a superior probability of being triumphant when it is aided by public support, or when arising from public needs or willingness (e.g., bear, Ursus spp., conservation in the USA – Jacobson and McDuff, 1998; Kellert, 1994; Miller 2005; Schenk, et al., 2007). Conservation awareness program is not the same for all the students. It depends on age, sex, type of school, occupation of the parents, economic status level of the family, type of family and the area they dwell. There are many factors that determine students' attitudes toward science. These are factors such as teacher, education environment, peer group and parents (Scantlebury *et al.*, 2001). Education has increasingly become a central objective for zoos (Patrick & Tunnicliffe, 2013) as the importance of spreading the conservation message has increased in profile. So these factors are one of the reasons for the lack of awareness about biodiversity from the students. First the teachers should have in-depth knowledge about nature and conservation of biodiversity. So that the acquaintance about biodiversity will be transferred to the students. Another factor is environment, where they dwell and the atmosphere of the school. Only when there is a natural environment, students will have a positive approach and attitude about biodiversity conservation. They should have comprehensive idea about the interconnection between the biodiversity and humans. Another thing that affects positive attitude towards science is teaching method. An effective teaching environment increases positive attitude towards science (Papanastasiou & Zembylas, 2002). The students, who have positive attitude towards science, keep positive attitude en route for their teacher, educational programs, and lessons and even towards their school at the same time. Again in students' developing positive attitude towards science, teachers and parents play an important role. There is a positive relationship between students' attitude towards school and their parents' interest in education (Keeves, 1975). Parents play an imperative role in student's stance about biodiversity. From childhood whatever is taught will be registered in their inner mind. Only when the teachers and parents have a positive attitude to conserve biodiversity, it will be implemented by the students. The attitude of the students towards biodiversity were analysed by various questions. Only some students had concern about conservation of biodiversity.

Awareness and imparting education to the students and the teachers is an appropriate solution to stop any deleterious impacts on biodiversity and to elevate any conservation aspect and the results of our study may be useful for the preparation of conservation programs, since they point out the factors that could confine the commitment of the students, which should be the focus of future conservation programs.

Conclusions

The study shows that students do recognise differences in bio-diversity across habitats and that the presence and character of vegetation are most decisive for perceiving species richness. While experts and lay people expressed such qualities in somewhat different ways, it was clear that preference for one type of environment was not directly motivated by its biodiversity, whether perceived or assessed.

Case Processing Summary

		N	Marginal Percentage
Schooltype	private school	487	59.8%
	government school	327	40.2%
School	school one	76	9.3%
	school two	82	10.1%
	school three	85	10.4%
	school four	78	9.6%
	school five	84	10.3%
	school six	85	10.4%
	school seven	78	9.6%
	school eight	81	10.0%
	school nine	77	9.5%
	school ten	88	10.8%
Gender	Male	367	45.1%
	Female	447	54.9%
Familytype	Nuclear type	439	53.9%

	Joined type	375	46.1%
Familyincome	above 10	566	69.5%
	below 10	248	30.5%
Education	graduate and above	320	39.3%
	schooling and illeterates	494	60.7%
Area	Urban	409	50.2%
	Rural	405	49.8%
Valid		814	100.0%
Missing		0	
Total		814	
Subpopulation		144[a]	

a. The dependent variable has only one value observed in 144 (100.0%) subpopulations.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
school	Between Groups	1255.753	1	1255.753	187.341	.000
	Within Groups	5442.852	812	6.703		
	Total	6698.604	813			
gender	Between Groups	.159	1	.159	.639	.424
	Within Groups	201.376	812	.248		
	Total	201.534	813			
Familytype	Between Groups	.014	1	.014	.056	.814
	Within Groups	202.228	812	.249		
	Total	202.242	813			
Familyincome	Between Groups	16.244	1	16.244	84.446	.000
	Within Groups	156.198	812	.192		
	Total	172.442	813			
education	Between Groups	14.658	1	14.658	66.292	.000
	Within Groups	179.544	812	.221		
	Total	194.201	813			
Area	Between Groups	.002	1	.002	.010	.921
	Within Groups	203.493	812	.251		
	Total	203.495	813			

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Table 1 : Descriptive statistics regarding the questionnaire answered by the Students

No	Questions
1.	Name:
2.	Gender:
3.	Standard: Age:
4.	Type of family: a. Joint b. Nuclear
5.	Residential: a. Rural b. Urban
6.	Type of School a. Govt b. Private
7.	Education status of parents: a. Schooling and illiterates b. Graduate and above
8.	Family income: a. Above 10,000 b. Below 10,000

BIODIVERSITY – AWARENESS QUESTIONNAIRE

1.	What does “Biodiversity” mean? a. Global warming b. The variety of life on Earth c. Genetically modified crops

2.	How many components are there in Biodiversity? a. 3 b. 5 c. 7
3.	Biodiversity is classified into how many kingdoms? a. 5 b. 3 c. 6
4.	We get food and medicines from... a. Plants b. Animals c. Both
5.	What is the most serious threat to biodiversity? a. Scientists collecting specimens b. Habitat loss c. Tourists
6.	Have you heard of the term "Poaching"? a. Yes b. No c. Not aware of it
7.	Do you know the term "endangered" animals? a. Yes b. No c. Not aware of it
8.	Do you know any animals extinct for the past in Indian sub continent? a. Yes b. No c. Not aware of it
9.	Do you feel that animals and plants are important for the food chain balance? a. Yes b. No c. Not aware of it
10.	If you happen to visit a ZOO and someone teases animals by throwing stones. Your

	reaction will be a. Not to do that b. Encourage them c. Ignore the incident
11.	Articles made from animal skin, fur, horns etc are available free of cost. Do you want to keep at home? a. Yes b. No c. Keeping such things are illegal
12.	Have you heard of any of the following terms? a. WWF b. Osai c. ATREE
13.	You see frogs in your veranda on a rainy day a. You kill them b. You put them in a small box to play with your friends c. You take them out and leave them in your garden
14.	Is biodiversity very important for our survival? a. Yes b. No c. Not aware of it.
15.	I hereafter.... a. Will not destroy the forest b. Will not torture the animals c. Will grow more trees and protect my motherland, and will also educate others.