CHAPTER - 4

DATA ANALYSIS AND INTERPRETATION

4. INTRODUCTION

The present chapter is devoted to the analysis and interpretation of the data collected through the interaction. They have been placed before the objectives with which the research had been under taken. Thus, the objectives and the outcomes of the research have been verified and the hypothesis has been tested.

The present chapter deals with the scores of Pre-test and Post-test, tabulation of the data, data analysis and interpretation.

In this study the calculations are based on the scores of Pre-test and Post-test. These scores are analyzed and frequency distribution is prepared on the same. In addition to that for every frequency distribution Mean and Standard Deviation are calculated.

4.1 DATA ANALYSIS AND INTERPRETATION

The hypothesis that was put to test was as given below.

There will be no significant difference in Mean achievement scores of Pre-test and Post-test.

The collected data were analyzed quantitatively using ‘t’ test.

The analyzed data have been presented in Table 4.1. 1

Table 4.1.1 Analysis of Pre-test and Post-test- Mean, SD, SEm, r, DF and 't' value.

Group	No. Of students	Mean scores	SD	SEm	r	DF	t-value & significance level
Pre-test	40	15.97	2.54	0.16	0.74	39	8.48 & 0.01
Post-test	40	19.87	2.60	0.29			

Interpretation

The computed t value 8.48 is greater than that of the table t value 2.71 at 0.01level for 39 degree of freedom. The calculated r value is 0.74; hence there is positive moderate correlation between the mean achievement scores of Pre-test & Post-test.

Therefore, the Null Hypothesis that there will be no significant difference between the mean achievement scores of Pre-test & Post-test is rejected. It means there is significant difference between the mean achievement scores of Pre-test & Post-test, which in turn shows effectiveness of the task based programme in Environmental Education.

So, the treatment is found to be effective as evident through the data.

The following are some samples of materials prepared by the pre-service teachers during the tryout of this intervention programme.

Task-1 Jigsaw Technique

Municipality waste

Task sheet -1

Name Nagma Aara **Roll No** 40

College Waymade college of Education.

Instructions: 1. Discuss the given task in the group.

2. Complete the task sheet on the basis of group discussion.

Air pollutant	How can it be exposed to human being	Impact on human beings
NH_3	⊙ It causes Air pollution. ⊙ The NH_3 gas is get exposed out from the deboriation of dumps and Garbages in which food, and Leaves	NH_3 is harmful gas It causes diseases related to respiratory system.
Pollen grain	It is get out from flower with the air from Garbage dumps	It causes respiratory tract disease
CO_2	Increase in CO_2 → Global warming → Green house effect	High temperature In the atmosphere Become hard to sustain.

Task sheet -1

Name Shweta Mishra **Roll No** 16.

College Waymade college of education

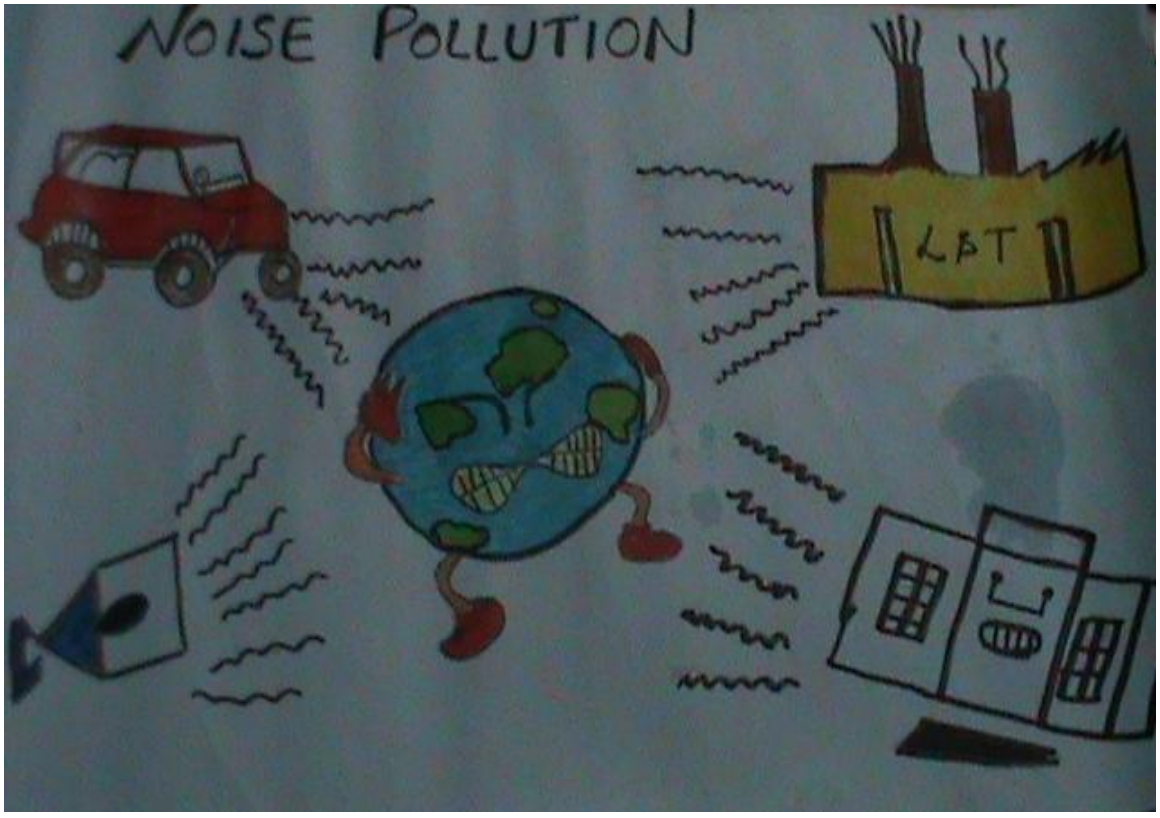
Instructions: 1. Discuss the given task in the group.

2. Complete the task sheet on the basis of group discussion.

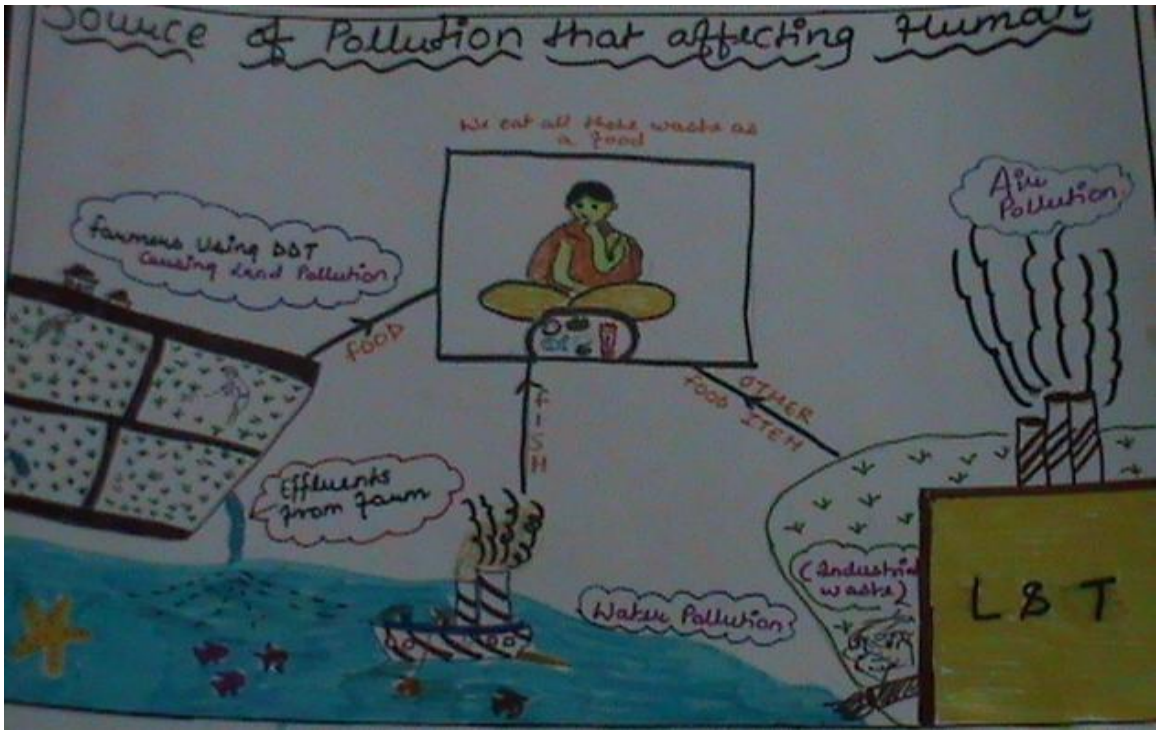
Marriage environment

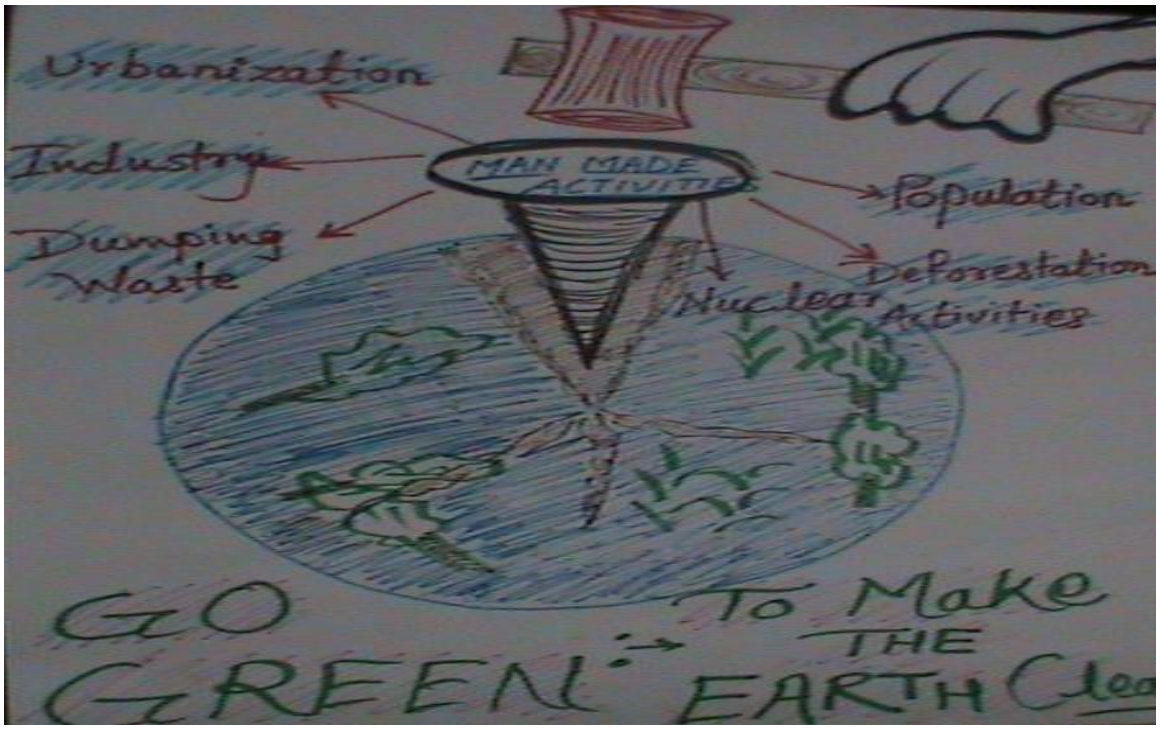
Air pollutant	How can it be exposed to human being	Impact on human beings
Carbon dioxide CO_2.	① Due to ~~excess~~ increased population ② vehicles emit smoke containing CO_2 ③ Smoking. ④ Lamps.	① effects C-O cycle ② suffocation ③ affects food chain
Sulphur dioxide SO_2	Exposed through the burning of crackers.	Causes skin disease like rashes, eczema, blisters, erethema etc.
Nitrogen dioxide NO_2	→ vehicles, exhaust.	→ Acid rain → affects surrounding every of human being.
Carbon monoxide CO.	→ smoke from vehicles.	→ respiratory system → irritation to eyes → asthma → lung cancer → death.

Task 2: Posters prepared by pre service teachers on noise pollution

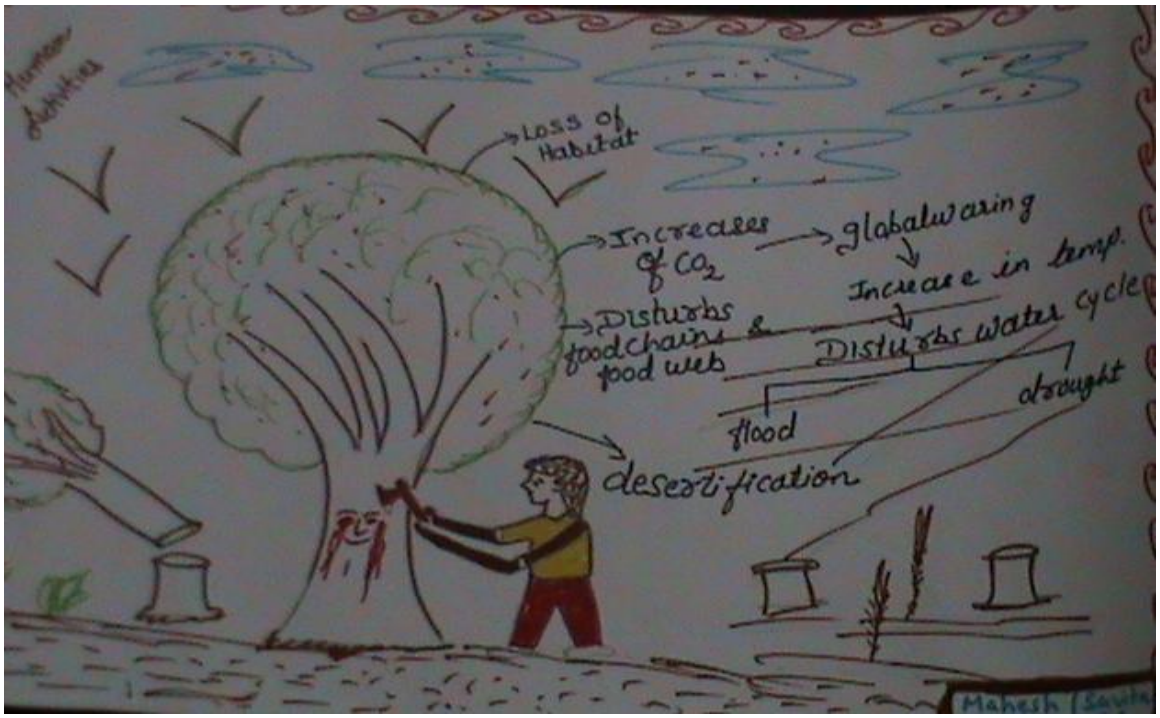


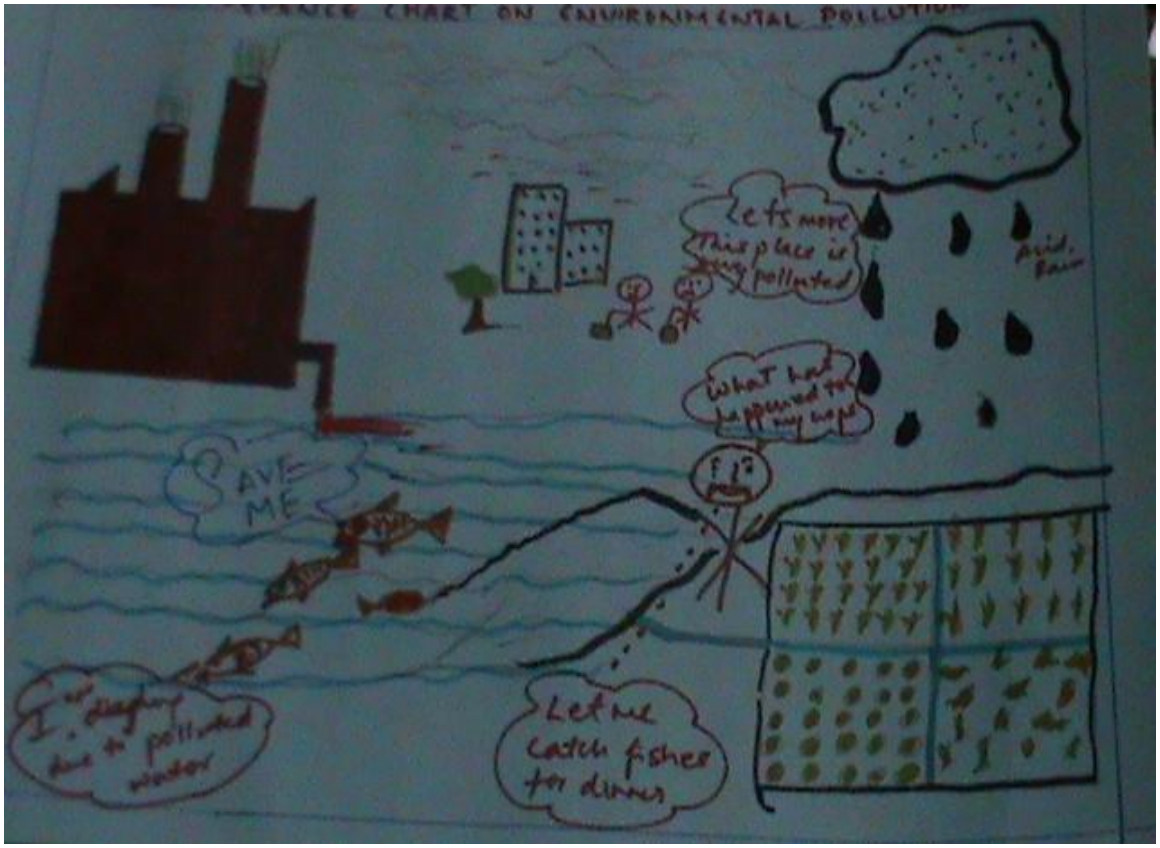
Task 3: Charts prepared by pre-service teachers on Source of pollution that affects human beings



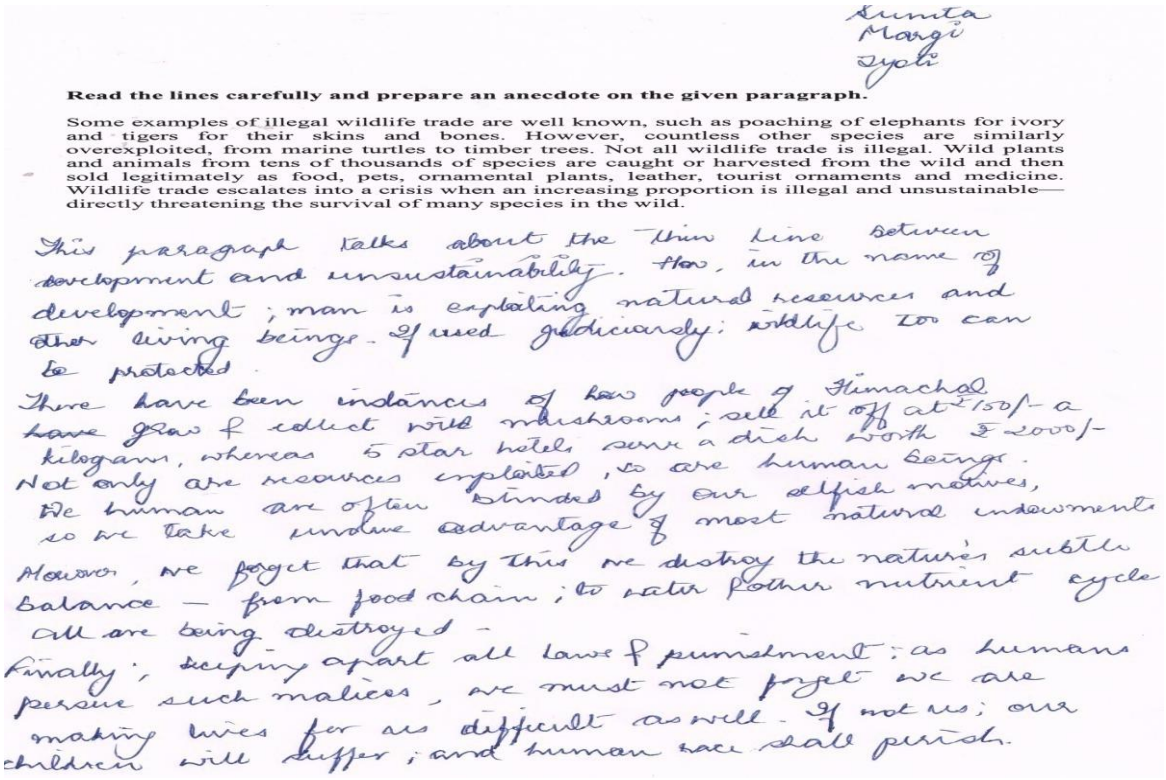


Task 4: Consequence Charts Prepared by pre-service teachers on environmental pollution





Task-5: Anecdotes prepared by pre-service teachers



Sunita
Margi
Jyoti

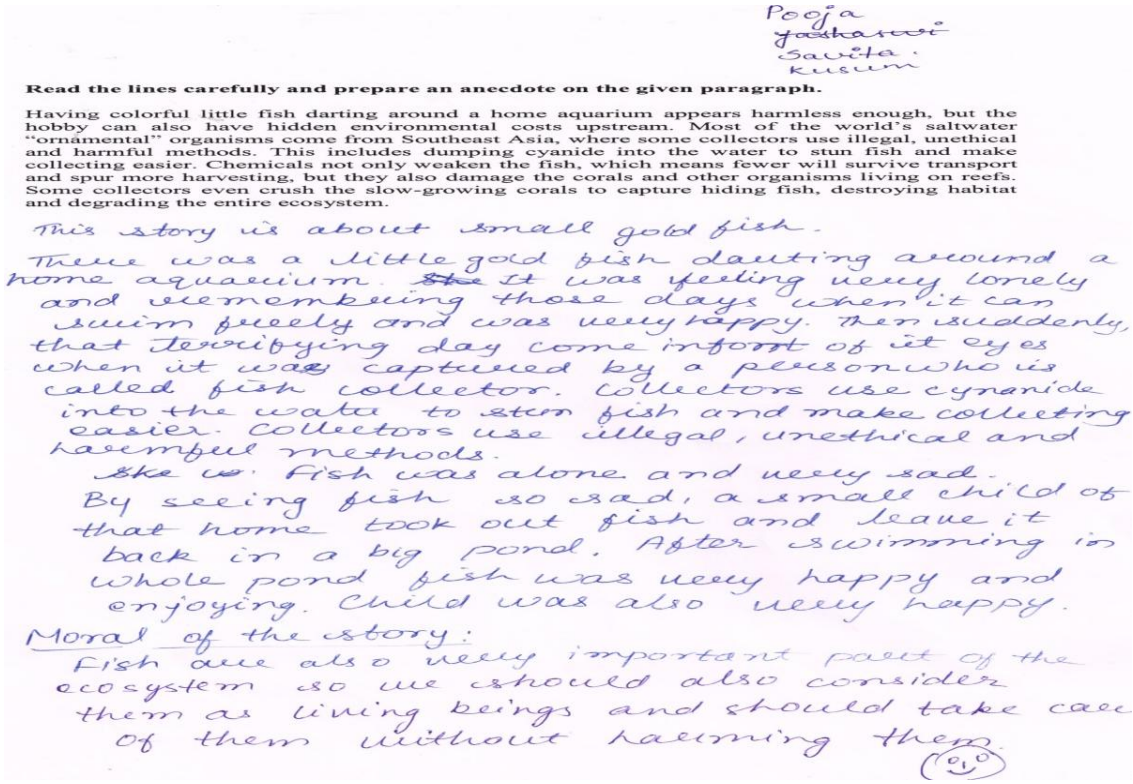
Read the lines carefully and prepare an anecdote on the given paragraph.

Some examples of illegal wildlife trade are well known, such as poaching of elephants for ivory and tigers for their skins and bones. However, countless other species are similarly overexploited, from marine turtles to timber trees. Not all wildlife trade is illegal. Wild plants and animals from tens of thousands of species are caught or harvested from the wild and then sold legitimately as food, pets, ornamental plants, leather, tourist ornaments and medicine. Wildlife trade escalates into a crisis when an increasing proportion is illegal and unsustainable—directly threatening the survival of many species in the wild.

This paragraph talks about the thin line between development and unsustainability. How, in the name of development; man is exploiting natural resources and other living beings. If used judiciously; wildlife too can be protected.

There have been instances of how people of Himachal have given & collect wild mushrooms; sell it off at ₹150/- a kilogram, whereas 5 star hotels serve a dish worth ₹2000/-. Not only are resources exploited, so are human beings. We human are often blinded by our selfish motives, so we take undue advantage of most natural endowments. However, we forget that by this we destroy the nature's subtle balance — from food chain; to water, other nutrient cycle all are being destroyed.

Finally; keeping apart all laws & punishment; as humans persue such malices, we must not forget we are making lives for us difficult as well. If not us; our children will suffer; and human race shall perish.



Pooja
Jashanvir
Savita
Kusum

Read the lines carefully and prepare an anecdote on the given paragraph.

Having colorful little fish darting around a home aquarium appears harmless enough, but the hobby can also have hidden environmental costs upstream. Most of the world's saltwater "ornamental" organisms come from Southeast Asia, where some collectors use illegal, unethical and harmful methods. This includes dumping cyanide into the water to stun fish and make collecting easier. Chemicals not only weaken the fish, which means fewer will survive transport and spur more harvesting, but they also damage the corals and other organisms living on reefs. Some collectors even crush the slow-growing corals to capture hiding fish, destroying habitat and degrading the entire ecosystem.

This story is about small gold fish.

There was a little gold fish darting around a home aquarium. ~~She~~ It was feeling very lonely and remembering those days when it can swim freely and was very happy. Then suddenly, that terrifying day come infront of it eyes when it was captured by a person who is called fish collector. Collectors use cynaride into the water to stun fish and make collecting easier. Collectors use illegal, unethical and harmful methods.

~~She~~ Fish was alone and very sad. By seeing fish so sad, a small child of that home took out fish and leave it back in a big pond. After swimming in whole pond fish was very happy and enjoying. Child was also very happy.

Moral of the story:

Fish are also very important part of the ecosystem so we should also consider them as living beings and should take care of them without harming them.

(9.5)

4.2 DATA ANALYSIS AND INTERPRETATION OF REACTION SCALE

Prior to commencing the research through the intervention, the researcher had formulated a null hypothesis, i.e. "There will be no significant difference in the observed frequencies and frequencies expected against equality hypothesis on various statements of scale".

To test the hypothesis on each statement frequencies and χ^2 (χ square) was calculated and then % analysis was done to get a more precise picture of responses.

Reactions of the students were analyzed in terms of frequencies, percentage responses, χ^2.They have been presented below

STATEMENT-1: During the session I was able to understand the concepts related to environmental education.

TABLE 4.2.1 Analysis of responses of pre-service teachers on statement-1

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	–	2 (5%)	10 (25%)	20 (50%)	8 (20%)	23 (0.01)
fe	8	8	8	8	8	

Interpretation

50% of the pre- service teachers said that all the sessions helped them to understand the concepts. Thus, the researcher found that all the sessions enabled the pre-service teachers to understand the concepts related to environmental education.

The computed χ^2 value 23 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-2: I enjoyed all the activities given by the instructor.

TABLE 4.2.2 Analysis of responses of pre-service teachers on statement-2

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	–	–	5 (12.5%)	10 (25%)	25 (62.5%)	37.76 (0.01)
fe	8	8	8	8	8	

Interpretation

62.5% of pre-service teachers enjoyed all the activities given by the researcher while 25% pre-service teachers enjoyed all the activities most of the times given by the researcher and only 5% of the pre-service teachers enjoyed all the activities sometimes given by the researcher. Hence, the researcher found that majority of pre-service teachers enjoyed all the activities given by the researcher.

The computed χ^2 value 37.76 is greater than that of the table χ^2 value 15.27 at 0.01 levels for 4 degree of freedom. Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-3: All the sessions increased my interest in the subject.

TABLE 4.2.3 Analysis of responses of pre-service teachers on statement-3

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	_	_	08 (20%)	18 (45%)	14 (35%)	17 (0.01)
fe	8	8	8	8	8	

Interpretation

45% of the pre-service teachers developed interest in the subjects most of the times.35% of the pre-service teachers developed interest in the subjects always. Therefore the researcher found that the majority of the pre-service teachers increased their interest in the subject.

The computed χ^2 value 17 is greater than that of the table χ^2 value 15.27 at 0.01 level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-4: The session helped to foster awareness about Environment pollution.

TABLE 4.2.4 Analysis of responses of pre-service teachers on statement-4

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	_	_	_	10 (25%)	30 (75%)	61 (0.01)
fe	8	8	8	8	8	

Interpretation

75% of the pre-service teachers found that the sessions helped them to foster awareness about environment pollution. 25% of the pre-service teachers found that the session helped them to foster awareness about environment pollution most of the times.

The computed χ^2 value 61 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-5: The illustrations given during the session enabled me to understand about different types of pollution.

TABLE 4.2.5 Analysis of responses of pre-service teachers on statement-5

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	_	_	9 (22.5%)	12 (30%)	19 (47.5%)	17.25 (0.01)
fe	8	8	8	8	8	

Interpretation

The illustrations given by the researcher during the session enabled a sizeable number (47.5%) of the pre-service teachers to understand about different types of pollution. 30% of the pre-service teachers understood different types of pollution most of the times. Thus the researcher found that the illustrations given during the session helped pre-service teachers to understand about different types of pollution.

The computed χ^2 value 17.25 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-6: I don't think that the activities given by the instructor was not relevant.

TABLE 4.2.6 Analysis of responses of pre-service teachers on statement-6

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	25 (62.5%)	10 (25%)	5 (12.5%)	–	–	37.75 (0.01)
fe	8	8	8	8	8	

Interpretation

62.5% of the pre-service teachers think that the activities given by the researcher was relevant. 25% of the pre-service teachers think that activities were rarely relevant. 5% of the pre-service teachers think that the activities were relevant only sometimes.

Therefore the researcher found that the activities given by the researcher were relevant. The computed χ^2 value 37.75 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-7: The activities given by the instructor were appropriate and the instruction given was clear.

TABLE 4.2.7 Analysis of responses of pre-service teachers on statement-7

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	_	_	_	17 (42.5%)	23 (57.5%)	38.25 (0.01)
fe	8	8	8	8	8	

Interpretation

57.5% of the pre-service teachers found that the activities and instruction given by the researcher were appropriate and clear. 42.5% of the pre-service teachers found that the activities and instruction given by the researcher were appropriate and clear most of the times. Thus, the researcher found that the activities given by the researcher were appropriate and the instruction given was clear.

The computed χ^2 value 38.25 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-8: All the activities given by the instructor helped me to develop skills and inculcate values to create awareness among others.

TABLE 4.2.8 Analysis of responses of pre-service teachers on statement-8

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	_	_	10 (25%)	10 (25%)	20 (50%)	19 (0.01)
fe	8	8	8	8	8	

Interpretation

A large majority (50%) of the pre-service teachers found that the activities given by the researcher helped them to develop skills and inculcate values to create awareness among others. 25% of the pre-service teachers found that the activities given by the instructor helped them to develop skills and inculcate values to create awareness among others sometimes and most of the times. Thus the researcher found that the activities given by the researcher enabled pre-service teachers to develop skills and inculcate values to create awareness among others.

The computed χ^2 value 19 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-9: The instructor encouraged me to share my knowledge about course content.

TABLE 4.2.9 Analysis of responses of pre-service teachers on statement-9

	Not at all	**Rarely**	**Sometimes**	**Most of the times**	**Always**	**χ^2 and level of significance**
fo	_	_	04 (10%)	04 (10%)	32 (80%)	76 (0.01)
fe	8	8	8	8	8	

Interpretation

A majority (80%) of the pre-service teachers responded that the instructor encouraged them to share their knowledge about course content. 10% of the pre-service teachers responded that the instructor encouraged them to share their opinion most of the times.

The computed χ^2 value 76 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

STATEMENT-10: I was motivated to learn the course material.

TABLE 4.2.10 Analysis of responses of pre-service teachers on statement-10

	Not at all	Rarely	Sometimes	Most of the times	Always	χ^2 and level of significance
fo	_	_	_	10 (25%)	30 (75%)	61 (0.01)
fe	8	8	8	8	8	

Interpretation

75% of the pre-service teachers responded that the instructor motivated them to learn the course material. 25% of the pre-service teachers responded that the instructor motivated them to learn the course material most of the times. Thus the researcher found that the pre-service teachers were motivated to learn the course material.

The computed χ^2 value 61 is greater than that of the table χ^2 value 15.27 at 0.01level for 4 degree of freedom.

Therefore, the Null Hypothesis is rejected. That means there is significant difference between the observed frequencies and expected frequencies.

4.3 CONCLUSION

Thus, from the above data analysis development of a task based programme in environmental education for pre-service teachers has been found effective as evident through the significant difference between the mean achievement scores of Pre-test & Post-test and also through the response given by the pre-service teachers on reaction scale.