Original Article

Construction And Tryout Of Natural Environment And Animal Welfare Awareness Program On Grade-IX Students

Sukanya Kadian[1*], Dr. Harikrishna A. Patel[2*]

[1]Research Scholar, Department of Education, Kadi Sarva Vishwavidyalaya, Gandhinagar.

[2*]Professor, Department of Education, Kadi Sarva Vishwavidyalaya, Gandhinagar.

Introduction

Animal welfare is essential as many animals around the globe suffer from food, entertainment, fashion, and technological advances and are also being utilized for exotic pets. Each animal deserves an enjoyable life in which they can benefit from five areas, i.e. food, environmental behaviour, health, and mental health. The sum of all living and non-living elements and their impact on our lives is the environment. It is the concept that calls for the necessity and duty of humans to protect, respect, and save the natural world from human-caused (created by humans) problems.

The secondary school students are the future of India and the protectors of our planet in the future. Students must be aware and knowledgeable about the environment and animal welfare. That is why the researcher created an environmental awareness of animal welfare program for students in Grade IX. In this research, the researcher conducted the program with Grade-IX students and then evaluated the program's effectiveness.

Objectives

Following is a list of the objectives that this study aims to accomplish.
1. To create a natural environment and animal welfare awareness program for students in Grade IX.
2. To examine the effectiveness of the natural environment and animal welfare awareness program among the students in Grade IX.
3. To Study the impact of the natural environment and animal welfare awareness program on students in Grade IX regarding performance.
4. To Study the efficacy of the natural environment and animal welfare awareness program; for students in Grade IX within the gender setting.
5. To study the effectiveness of natural environment and animal welfare awareness program on Grade-IX students in the context of their academic achievement in the previous year.

Hypotheses

The hypotheses of the present study are as follows.

Sr. No.	Hypothesis
1	There is no significant difference between the mean scores of post-test obtained by students of experimental and controlled groups.
2	There is no significant difference between the mean scores of post-test obtained by boys of experimental and controlled groups.
3	There is no significant difference between the mean scores of post-test obtained by girls of experimental and controlled groups.
4	There is no significant difference between mean scores of post-test obtained by students having higher achievement of experimental and controlled groups.
5	There is no significant difference between mean scores of post-test obtained by students having lower achievement of experimental and controlled group.

Limitations

The limitations of the present study are given below.

Sukanya Kadian

Sr. No.	Limitations
1	The present study was conducted in a New Shayona School selected from Ahmedabad city.
2	The researcher constructed a natural environment and animal welfare programme. Thus, this program's limitations were the limitations of this study.
3	The researcher constructed a post-test. Thus, all the limitations of this post-test were the limitations of this study.

Research Method

In the present study, the researcher checked the effectiveness of the awareness program constructed by the researcher. To fulfil this purpose, the researcher used an experimental research method in which only post-test equivalent groups experimental research design was used.

Figure 1: Experimental Design
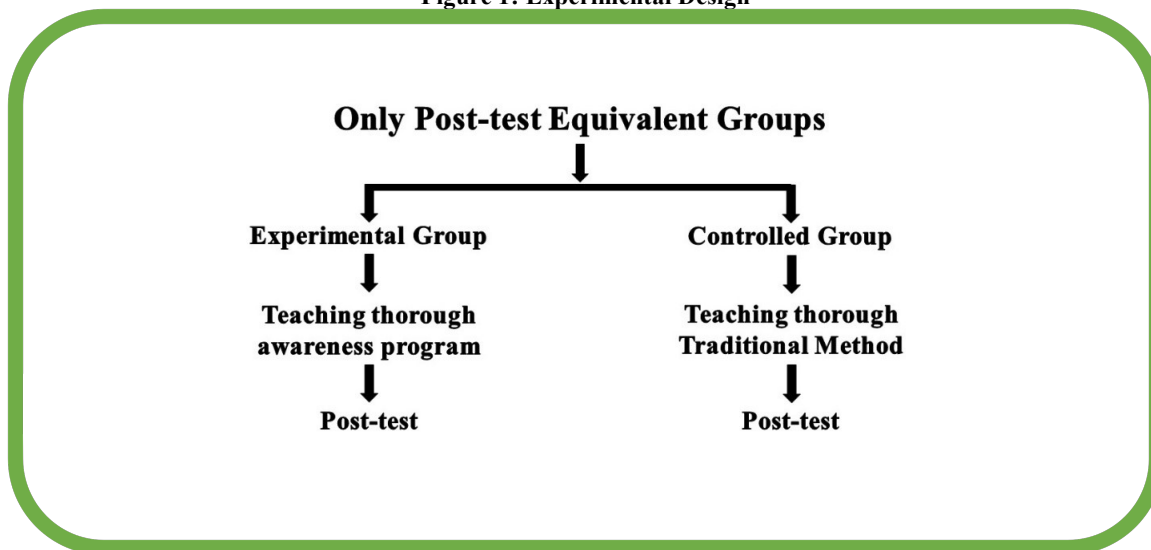
Research Tool

The researcher used an awareness programme and post-test as research tools:

1. Natural Environment and Animal Welfare Program

The researcher created an awareness program with different activities. It included group discussions where people could share their thoughts and ideas. There were films and videos to watch that showed important information. Experts also gave lectures to teach people about the topic.

The program went beyond the classroom, too. Participants went on nature walks to experience the outdoors directly. They also did drawings to express themselves artistically. As a hands-on activity, they planted trees and plants.

The program raised awareness by combining various activities like discussions, videos, lectures, nature walks, art, and planting. People could learn through different methods that appealed to their interests and learning styles. The program aimed to increase understanding and inspire people to care about the environment.

2. Post-test

The final test has 50 multiple-choice questions. Each question has four answer choices. Only one answer choice is correct, while the other three are wrong answers. For each question a student answers correctly, they get 1 mark. If a student answers incorrectly, they get 0 marks. There is no penalty for guessing. The total marks possible on the test is 50 marks. This is because there are 50 questions, and each correct answer is worth 1 mark. The number of marks a student gets shows how well they learned the material. Higher scores mean better understanding. The 50 multiple-choice questions allow the same testing for all students.

Careful review ensures the questions and answers are proper.

In summary, it is a test with 50 multiple-choice questions. Students get 1 mark for each correct answer, with the highest possible score of 50 marks.

This score measures how much a student has learned.

Sukanya Kadian

Research Sample

The researcher selected 80 students from New Shayona school and employed a pair-matching method to divide them into two equal groups of 40 students each. This division was based on the students' total marks from the previous year's (Grade 8) annual examination. The researcher calculated the median of the previous year's total marks and then classified the students into "high achievement" and "low achievement" groups accordingly. Those students whose total marks exceeded the median value were designated as the "high achievement" group, while those scoring below the median fell into the "low achievement" group. Consequently, one group comprised 40 "high achievement" students, and the other group consisted of 40 "low achievement" students, creating two comparable groups balanced in their prior academic performance as measured by the previous year's total marks.

Table 1.0 Sample of the Study

Group	Experimental		Controlled		Total
Gender / Achievement	Boys	Girls	Boys	Girls	
High	8	13	8	11	40
Low	12	7	12	9	40
Total	20	20	20	20	80
	40		40		

Table 10 shows that there are 80 students total in the study, equally divided into 2 groups of 40, called Experimental and Controlled. In each group, the students are further split into 4 categories based on gender (boys or girls) and previous achievement (high or low scores from last year). The Experimental group has 8 high-scoring boys, 13 high-scoring girls, 12 low-scoring boys, and 7 low-scoring girls. Likewise, the Control group has 8 high-scoring boys, 11 high-scoring girls, 12 low-scoring boys, and 9 low-scoring girls. So, there are an equal number of boys and girls and high and low achievers, spread evenly across the experimental and controlled groups. This balanced arrangement ensures a fair comparison between the two groups when looking at later study results.

Data Collection

The researcher conducted a 15-day experiment with two groups of students. One group, the experimental group, participated in nature and animal welfare activities. The other group, called the control group, received traditional teaching methods.

After the 15 days, both groups took a post-test. The post-test had 50 multiple-choice questions worth one mark for 50 marks. The students had 50 minutes to complete the test. Once the test was over, the researcher collected all the answer sheets from the students.

The purpose of the experiment was to see if nature and animal welfare activities had an impact on student learning compared to traditional teaching methods. The researcher will analyze the post-test scores to determine if there is a difference between the two groups.

Data Analysis

The researcher carefully checked and graded all the answer sheets, giving each student a score out of 50 marks. These scores were then used for data analysis. The researcher developed five hypotheses to test the effectiveness of the two teaching methods. These hypotheses compared the students' average scores in the experimental group (who did nature and animal welfare activities) and the control group (who had traditional teaching).To test these hypotheses, the researcher used t-test statistical methods to compare the two groups' mean (average) scores.

The results of these t-tests are presented in the tables below. The tables show the numerical findings from analyzing and comparing the scores of the two student groups.

Using these t-tests and analyzing the scores, the researcher aimed to understand if the nature and animal welfare activities helped students learn better than traditional teaching methods.

$H0_1$	There is no statistically significant discrepancy in the average post-test scores achieved by students in the experimental and controlled groups.

Table 2.0 The result of the t-test between mean scores of post-tests obtained by students of experimental and controlled groups

Sukanya Kadian

Group	N	M	SD	SED	t	Significance
Experimental	40	40.98	4.29	1.19	8.58	0.01
Controlled	40	30.73	6.21			

df	0.05	0.01
78	1.99	2.64

Table 4.10 presents the results of a t-test analysis conducted to compare the mean scores of students in the experimental and control groups. The calculated t-value, which measures the difference between the two group means relative to the variability within each group, is reported as 8.58.

To determine the statistical significance of this calculated t-value, we need to compare it with critical t-values from the t-distribution table. For a degree of freedom (df) of 78, which is likely based on the sample sizes of the two groups, the critical t-values at the 0.05 and 0.01 significance levels are 1.99 and 2.64, respectively.

Since the calculated t-value of 8.58 is greater than the critical t-values at both the 0.05 and 0.01 significance levels, we can reject the null hypothesis (H01) that there is no significant difference between the mean scores of the experimental and control groups. This result indicates that the difference in mean scores between the two groups is statistically significant.

Furthermore, the data reveals that the mean score of the experimental group in the post-test is 40.98, while the control group's mean score is 30.73. The higher mean score of the experimental group suggests that the Natural Environment and Animal Welfare Awareness program implemented for the experimental group positively impacted student performance compared to the traditional teaching methods used for the control group.

Based on these findings, the researcher can conclude that the Natural Environment and Animal Welfare Awareness program constructed for Grade-IX students was highly influential in enhancing their learning outcomes, as evidenced by the significantly higher mean score achieved by the experimental group compared to the control group.

It is important to note that these conclusions are based on the assumption that the study was conducted with appropriate experimental controls, randomization, and other necessary precautions to ensure the validity of the results.

H0₂	There is no significant difference between the mean post-test scores obtained by boys of experimental and controlled groups.

Table 3.0 The result of the t-test between mean scores of post-tests obtained by boys of experimental and controlled groups

Boys	N	M	SD	SED	t	Significance
Experimental	20	40.50	4.31	1.79	5.63	0.01
Controlled	20	30.40	6.76			

df	0.05	0.01
38	2.02	2.71

Table 4.13 shows the results of a statistical test called a t-test. This test was used to compare the average scores of boys in the experimental group (who did the nature and animal activities) and the control group (who had regular teaching).

The calculated t-value from this test is 5.63. To know if this value is significant, we compare it to standard values called "table t-values". These values depend on the number of boys in each group, captured by "degrees of freedom" (df).

For this study, with df=38, the table t-value is 2.02 at a 0.05 significance level and 2.71 at a 0.01 level. The score difference is statistically significant since the calculated t-value of 5.63 is higher than both these table values.

So, we reject hypothesis H021, which states that there is no real difference between the boys' scores in the two groups. The results show there is a meaningful difference in their average scores.

Looking at the actual average scores, the boys in the experimental group scored 40.50, while the boys in the control group scored 30.40. The higher score for the experimental group indicates that the nature and animal welfare program helped the boys learn better than traditional teaching methods.

In simple terms, the data analysis reveals that the researcher's nature and animal welfare activities were very effective in improving learning for 9th-grade boys compared to regular teaching methods alone.

H03	There is no significant difference between the mean post-test scores of girls in the experimental and controlled groups.

Table 4.0: The result of the t-test between mean scores of post-tests obtained by girls of experimental and controlled groups

Girls	N	M	SD	SED	t	Significance
Experimental	20	41.45	4.33	1.61	6.44	0.01
Controlled	20	31.05	5.77			

df	0.05	0.01
38	2.02	2.71

Table 4.16 presents the results of a statistical analysis comparing the learning outcomes of girls in the two study groups. The calculated t-value, a measure of the difference between the groups, is an impressive 6.44.

To put this number into context, we need to consider what's called the "degrees of freedom" (df), which is related to the number of girls in each group. For this study, with 38 degrees of freedom, the critical t-value thresholds are 2.02 at a 0.05 significance level and 2.71 at a 0.01 significance level.

Remarkably, the calculated t-value of 6.44 surpasses both critical values, indicating that the difference in learning outcomes between the girls in the two groups is doubtful to have occurred by chance alone.

As a result, we can confidently reject the null hypothesis (H03) that stated there is no meaningful difference between the groups. The data demonstrates a significant divide in the academic performance of girls exposed to the nature and animal welfare program compared to those who received traditional instruction.

Digging deeper, we find that the average score for girls in the experimental group was 41.45, while their counterparts in the control group trailed behind with an average of 31.05. This discrepancy underscores the profound impact of the researcher's innovative nature and animal welfare curriculum on the learning experiences of young female students.

In essence, the numbers speak volumes: the researcher's thoughtfully designed program, which integrated elements of the natural world and animal welfare, proved to be a resounding success in enhancing the academic achievement of ninth-grade girls. The data leaves little doubt that this holistic approach to education unlocked newfound potential and fostered a deeper understanding of the subject matter among the young learners who had the privilege of experiencing it firsthand.

H04	There is no significant difference between mean post-test scores obtained by students with higher achievement in experimental and controlled groups.

Table 5.0 The result of the t-test between mean scores of post-tests obtained by students having higher achievement of experimental and controlled groups

High	N	M	SD	SED	t	Significance
Experimental	21	43.81	2.65	0.89	8.66	0.01
Controlled	19	36.11	2.94			

df	0.05	0.01
38	2.02	2.71

Table 4.19 shows the results of a critical analysis comparing the learning of high-achieving students in the two study groups.

The analysis used a statistical test called a t-test, which gives us the "calculated t-value" of 8.66. This number tells us how different the scores of the two groups are.

To understand if this difference is meaningful or just by chance, we compare the calculated t-value to some standard values from tables, called "table t-values." These depend on the number of high-achievers in each group.

For this study, with 38 degrees of freedom (related to the group sizes), the table t-values are 2.02 at a 0.05 level and 2.71 at a 0.01 level. Since the calculated t-value of 8.66 is much higher than both these values, the difference between the groups is doubtful to have happened by chance.

Based on this evidence, we can reject hypothesis H04, which stated there is no real difference in scores between the high-achieving students who did the nature activities and those who did regular teaching.

Looking at their actual average scores drives this point home. The high-achievers in the experimental nature group scored an impressive 43.81 on average, while their counterparts in the regular teaching group trailed far behind at 36.11.

This stark difference highlights how powerful and effective the researcher's innovative nature and animal welfare program were, especially for students who were already academically high achievers. By tapping into their natural curiosities and connecting learning to the real world, this unique curriculum boosted their achievement to even greater heights.

In simple terms, the data analysis proves that for ninth-grade students at the top of their class, incorporating elements of nature and animal welfare into their learning was unparalleled, helping them soar even higher academically compared to traditional teaching alone.

H05	There is no significant difference between mean post-test scores obtained by students with lower achievement in experimental and controlled groups.

Table 6.0 The result of the t-test between mean scores of Post test obtained by students having lower achievement of experimental and controlled groups

Low	N	M	SD	SED	t	Significance
Experimental	19	37.84	2.87	1.07	11.15	0.01
Controlled	21	25.86	3.89			

df	0.05	0.01

38	2.02	2.71

Table 4.22 compares the scores of lower achieving students in the two groups - one that did nature and animal activities and one that had regular teaching.

The researchers used a statistical test called a t-test to see if there was a fundamental difference between the groups' scores. The calculated t-value from this test was 11.15.

They compared this value to standard values called "table t-values" to understand if it is meaningful or just by chance. For this study, with 38 students in each group, the table t-values were 2.02 and 2.71.

Since 11.15 is much higher than both these values, it means the difference in scores between the two groups was very unlikely to have happened just by luck. This allowed the researchers to reject their initial hypothesis that there would be no difference.

Looking at the actual average scores shows a clear gap. The lower achievers who did the nature program scored 37.84 on average, while those with regular teaching only scored 25.86.

This significant difference shows that nature and animal activities helped lower-achieving students learn and perform better academically than regular teaching methods.

In simple terms, the data proves that for ninth graders who had previously struggled, incorporating nature and animal elements into their learning was hugely beneficial and helped them improve their scores substantially.

Major Findings

Based on the results of t-tests, the following significant finding could be derived:

1. The Natural Environment and Animal Welfare Awareness programme constructed by the researcher is very effective for students of Grade- IX.
2. The Natural Environment and Animal Welfare Awareness programme constructed by the researcher effectively affects boys of Grade- IX.
3. The Natural Environment and Animal Welfare Awareness programme constructed by the researcher is very effective on girls of Grade- IX.
4. The Natural Environment and Animal Welfare Awareness programme constructed by the researcher is very effective for students with higher Grade- -IX achievement.
5. The Natural Environment and Animal Welfare Awareness programme constructed by the researcher is very effective for students with lower Grade- IX achievement.

Final Thoughts

The quality of the physical environment plays a pivotal role in shaping human existence and enabling communities to thrive. Access to a favorable climate, abundant clean water sources, and fertile soil create an ecological foundation that nurtures life and sustains human endeavours. Conversely, harsh environmental conditions characterized by extreme temperatures, water scarcity, and infertile land pose formidable challenges, making survival and progress an uphill battle. Recognizing the profound impact of the natural world on human well-being, the researcher embarked on an innovative study to explore the potential benefits of integrating environmental and animal welfare education into mainstream curricula. Specifically, the researcher crafted and implemented a comprehensive "Natural Environment and Animal Welfare" program tailored for ninth-grade students, a critical juncture in their academic journey. To rigorously evaluate the efficacy of this pioneering program, the researcher designed an experimental study involving two distinct groups of ninth-grade students. The experimental group was immersed in the Natural Environment and Animal Welfare program, a multifaceted curriculum that aimed to nurture a deep appreciation for the natural world, foster environmental stewardship, and cultivate compassion for animal welfare. Through hands-on activities, interactive lessons, and real-world applications, these students were exposed to the intricate web of life that sustains our planet and the ethical considerations surrounding our interactions with the natural realm.

In contrast, the control group received traditional teaching methods, devoid of the specialized nature and animal welfare curriculum, as a baseline for comparison.

Upon conclusion of the interventions, the researcher meticulously analyzed the outcomes, employing rigorous statistical methods to evaluate the program's impact on student learning. The results were remarkable: students who participated in the Natural Environment and Animal Welfare program demonstrated significantly higher academic achievement and understanding than their counterparts in the control group.

These findings underscore the profound potential of integrating environmental and animal welfare education into mainstream curricula. By bridging the gap between academic concepts and the world around us, the innovative program tapped into students' innate curiosity and fostered a deeper connection with the natural rhythms that sustain life on Earth. This holistic approach enhanced academic performance and instilled a sense of responsibility and stewardship towards the planet and its inhabitants.

The study's implications are far-reaching, highlighting the need to reframe education as a vehicle for imparting knowledge and cultivating a profound appreciation for the delicate balance of ecosystems and the ethical treatment of all living beings. By equipping students with a comprehensive understanding of the intricate relationships that govern the natural world, we empower them to become agents of positive change, armed with the knowledge and compassion necessary to tackle our time's environmental and ethical challenges.

Sukanya Kadian

This groundbreaking research serves as a clarion call to educational institutions worldwide, urging them to embrace a holistic approach to learning that transcends traditional boundaries and fosters a deep reverence for the natural world that sustains us all.

References
1. Baker, L. W. (2015). *Animal Rights and Welfare*. Denver: Greenwood.
2. Broom, D. M. (2005). Animal Welfare Education: Development and Prospects. *Journal of Veterinary Medical Education,* 32(4), 438-441. DOI: https://doi.org/10.3138/jvme.32.4.438
3. Crutzen, P. J., Aselmann, I. & Seiler, W. (1986). *Methane production by domestic animals, wild ruminants, other herbivorous fauna and humans.* New York: Springer Publishing Co.
4. Diaz, R. J., Rosenberg (2008). Spreading dead zones and consequences for marine ecosystems. *Science*, 321, 926-929.
5. Fine, A. H. (2006). *Handbook on Animal-Assisted Therapy: Theoretical Foundations and Guidelines*. London: Elsevier Inc.
6. Grulzaski, B. (1983). The Case Against Raising and Killing Animal for Foods. *Ethics and Animals*, 251-265. DOI: https://doi.org/10.1007/978-1-4612-5623-6_17
7. Keeling, L. J., Rushen, J. & Duncan, I. J. H. (2017). Understanding of Animal Welfare. *Animal Welfare*. DOI: https://doi.org/10.1079/9781845936594.0013
8. Lodrick, D. O. (1981). *Sacred cows, sacred places: Origins and survivals of animal homes in India*. Berkeley: University of California Press.
9. Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V. & Rosales, M. (2006). Livestock's Long Shadow: Environmental Issues and Options. *Food and Agriculture Organization of the United Nations,* Rome.
10. Webster, A. J. F. (2001). Farm Animal Welfare: The Five Freedoms and the Free Market. *Veterinary Journal*, 161(3), 229-237.