



Exploring The Impact Of Demonstration Models And Activity-Based Learning Approach In Teaching Science At Government Higher Secondary School Trespone, Kargil.

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Abstract: This research investigates the efficacy of demonstration models and activity-based learning approaches in enhancing science education at Government Higher Secondary School Trespone, Kargil. The conventional teaching methods, solely focusing on curriculum completion for exams, have resulted in students lacking deeper understanding and creativity in science. This study aims to address this issue by implementing innovative teaching strategies to foster curiosity, creativity, and inventiveness among students. The demonstration model coupled with activities has emerged as a promising approach, significantly impacting student enrollment, academic performance, and extracurricular achievements. Over the past three years, this approach has consistently resulted in the achievement of a 100% result in biology annual exams and notable success in national competitive exams. Additionally, students excelled in science competitions, demonstrating enhanced critical thinking and innovation. This learner-centric approach not only reduces teacher workload but also improves student engagement and communication skills. The findings of the research underscore the importance of adopting innovative teaching methods to cultivate a generation of creative thinkers and innovators in science education.

Introduction

In recent years, the traditional lecture-based approach to teaching science in schools in general and at Government Higher Secondary School Trespone, Kargil, in particular, has been under scrutiny due to its limited effectiveness in fostering student creativity and innovation and in-depth understanding of the subjects. Recognizing the need for change, this study explores alternative teaching methodologies to address this pressing issue. The prevailing trend of focusing on exam-oriented instruction has resulted in superficial learning outcomes, with students passing tests without a genuine grasp of scientific concepts. This gap in understanding not only hampers academic performance but also stifles students' potential for innovation, a critical skill in today's rapidly evolving world.

To bridge this gap, the research advocates for the adoption of demonstration models and activity-based learning approaches. These methods have demonstrated significant success in other educational contexts and are poised to revolutionize science education at Government Higher Secondary School Trespone. Over a three-year period, the implementation of these strategies has yielded promising results, with notable improvements in student performance, engagement, and extracurricular achievements. By shifting the focus from rote memorization to hands-on experimentation and exploration, this research aims to cultivate a generation of scientifically literate individuals equipped with critical thinking and problem-solving skills. The success of this approach not only benefits individual students but also contributes to the overall academic excellence and reputation of the school. Through this study, we hope to inspire other educators to embrace innovative teaching methodologies and empower students to become active participants in their own learning journey.

Research Problem

The learning outcomes of our students were insufficient, and they lack the drive to put in extra effort, make goals, or attempt novel experiences. Additionally, our students showed no interest in participating in science exhibitions or hands-on activities. Teachers were making more effort, but the results did not reflect this. But I discovered that there is an issue at our school where students are not enjoying their coursework and are absent more often than not. The vast majority of absentee girls attend school because they have no interest in learning, despite the extremely low enrollment. Students were not aware of competitive examinations because career counseling was not provided. Ultimately, by utilizing a range of research techniques and factors, I was able to pinpoint this problem, which influences our students' participation in extracurricular and academic activities and aids our teachers and students in resolving a range of problems.

Research Question

- Which instructional strategy yields the highest ratings from students among those using it?
- Could Government higher secondary school Trespone be significantly impacted by the demonstration model and activities-based learning?
- What is the impact of the Demonstration model and activities on learning on academic performance, such as the results of the twelve class board examinations?
- To what extent students' creativity and innovation in science and technology are enhanced through science model competition participation, encouragement, and motivation stems from the demonstration model and activities base methods?
- How many students have been selected for competitive exams like NEET and JEE after we implemented the demonstration model as a basis for our teaching and learning activities?

Research Methodology

- A specific sampling technique was implemented for selecting the higher secondary schools Trespone, located in Kargil.
- There are 212 students registered in classes eleven and twelve. A convenient sample of each class was selected and questions about the best pedagogies used by their teachers for teaching and learning were presented to the students. They also inquired as to why the students gave a particular teaching strategy such high ratings.
- A total of 212 students received questions. Students were asked to assign a number on a scale of 1 to 5, where 5 was the highest significance, to the various teaching strategies employed by their teachers. The percentage-based method was used to gather and assess the study's findings.

Objective

- To determine the most effective teaching strategy based on student ratings.
- To analyse the effect of demonstration and activity-based learning on students' academic performance as determined by their institution's results.
- To ascertain the impact of the demonstration model of instruction on students' innovation and creativity.
- To find out how much this approach motivates students to take competitive examination.

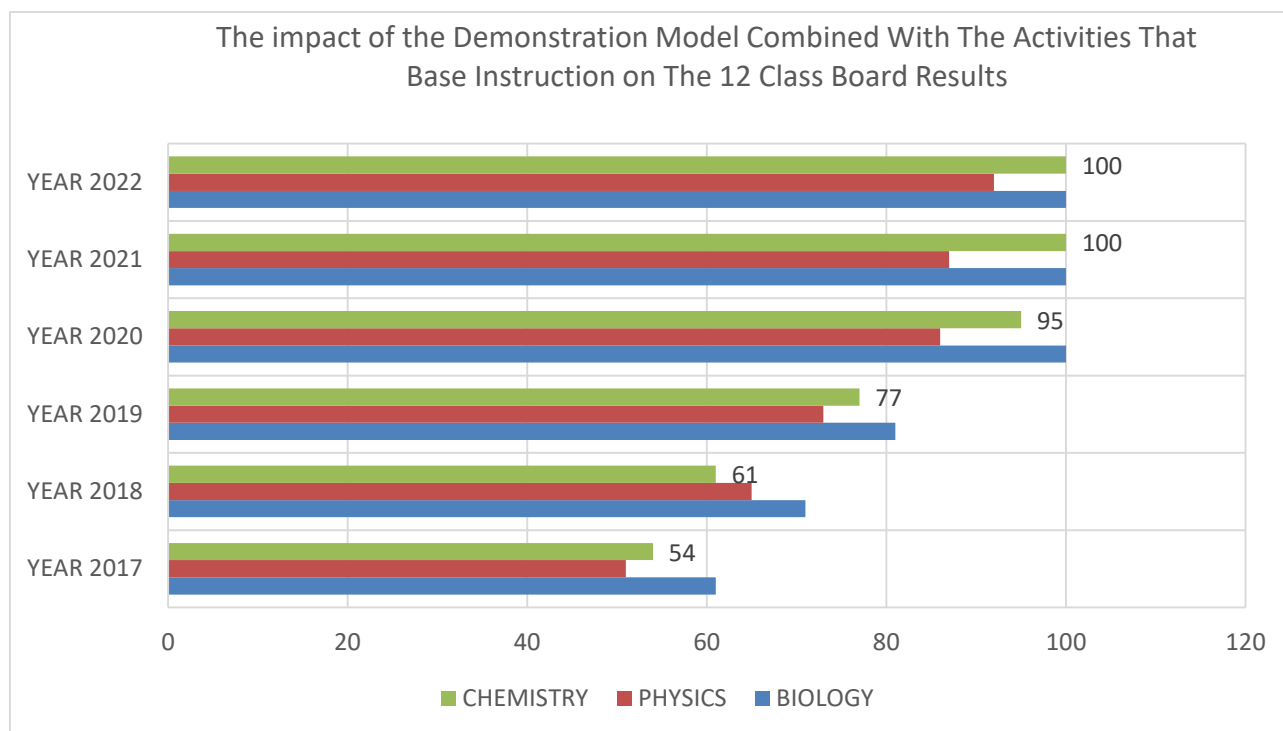
Results and findings

When we used various teaching methods, such as the demonstration model's activities base, play-way method, lecture method, brainstorming, case study, and assignment method, students rated the demonstration model's activities higher, which had an impact on our students' extracurricular as well as academic performance. We have adopted a demonstration model for activities and teaching that impact Our school's biology results have been wholehearted for the past three years, and the results of physics and chemistry have also improved as a result of using the best teaching strategies based on student ratings. It also affects the creativity of learners.

According to table 1. N, which shows the number of students, ratings were given on a scale of 1 to 5, with 1 representing the least interesting teaching method and 5 the most interesting.

Total Method of Teaching	Rating					Number of Students
	1	2	3	4	5	
	N %	N %	N %	N %	N %	
1.Demonstration Model Cum Activities Base	22 10.3%	43 20.2%	23 10.8%	33 15.5%	91 42.9%	212 Students at each teaching method
2.Group discussion and play way method	22 10.3%	32 15%	38 17.9%	42 19.8%	78 36.7%	
3.Lecture Method	36 16.9.6%	31 14.6%	47 22.1%	47 22.1%	51 24%	
4.Brainstorming	57 26.8%	46 21.6%	22 10.3%	55 25.9%	32 15%	
5 Case study	56 26.4%	48 22.6%	22 10.3%	57 26.8%	29 13.6%	
6 Assignment	60 28.3%	51 24%	57 26%	23 10.8%	21 9.9%	

Table 1's Figure depicts the comparative analysis of the different teaching methods.



Our school has placed first position four times in this science creativity model competition, and our students have position holder at the zonal, district, UT, and national levels as a result of adopting the best teaching practices that foster students' critical thinking and creativity additionally, following the application of the best learner-centric demonstration cum activities base teaching methodology, over 25 students were selected in the NEET and JEE exams. Two students named Nawaz Ali, who placed first in the UT Ladakh NEET examination in 2022, and Zulfikar Ali, who placed first in the JEE exam in 2023, did so as a result of the effect of using the best teaching practices. Furthermore, it enhanced the quantity of students enrolled in upper secondary education programs. As a result of this learner-centered approach that involves many students in the process, teachers are not as burdened and students are able to create over 100 functional models on their own. This method also fosters creativity and encourages discussion, both of which improve interpersonal communication skills.



Figure 1. 2nd position at State level in science model exhibition 2023
National Level 2023



Figure 2. 1st position at



Figure 3. 1st position at District level in science exhibition 2023
District in science exhibition 2022

Figure 4. 2nd position at



Figure 5. 1st position in science Model competition 2021
Model exhibition 2021

figure 6. 2nd position in science



Figure 7. 1st position in NEET UT Ladakh



Figure 8. 1st position in JEE UT Ladakh

GOVT. HIGHER SECONDARY SCHOOL TRESPONE
DEPARTMENT OF BIOLOGY (ZOOLOGY)
 Name of the Students who got Selected in NEET/JEE Examination under the Guidance of Mr. Mehboob Ali (Lecturer Zoology)

Serial Number	Name Of Candidates	Year	Mode Of Teaching	Selected In
1	Nawaz Ali	2022	Classroom (Offline Mode)	NEET Topper UT Ladakh
2	Zulfqar Ali	2022	Classroom (Offline Mode)	JEE Topper UT Ladakh
3	Nawaz Ali	2022	Classroom (Offline Mode)	JEE UT Ladakh
4	Rafiq Akbar	2022	Classroom (Offline Mode)	NEET UT Ladakh
5	Mohd Ali	2022	Classroom (Offline Mode)	NEET UT Ladakh
6	Syed Hadi	2022	Classroom (Offline Mode)	NEET UT Ladakh
7	Hussain Bano	2022	Classroom (Offline Mode)	NEET UT Ladakh
8	Nusrat Fatima	2022	Classroom (Offline Mode)	NEET UT Ladakh
9	Aysha Bano	2022	Classroom (Offline Mode)	NEET UT Ladakh
10	Mohd Ali	2019	Online Mode	A.I.M.S Topper UT Ladakh
11	Nusrat Fatima	2018	Classroom (Offline Mode)	NEET UT Ladakh
12	Archi Farzana	2020	Classroom (Offline Mode)	NEET UT Ladakh
13	Aga Nurhan	2018	Online Mode	A.I.M.S & NEET UT Ladakh
14	Kawana Fatima	2019	Classroom	JEE (IIT) ADVANCE
15	Mohd Ali	2022	Classroom	NEET
16	Fatima	2021	Online	NEET
17	Nusrat Fatima	2015	Online	NEET
18	MUHAMMAD ALI	2023	Offline	NEET
19	Sulaiman Bano	2020	online	NEET
20	Fatima Bano	2020	online	NEET
21	Nusrat Fatima	2019	Online	B.D.S

Figure 9. Names of NEET Selected Students



figure10. Effective Demonstration Model that encourages learning

Our school's activities are impacted by the new knowledge that both teachers and students are gaining, as well as by the effective demonstration model and activity-based approach to instruction. Our performance and other activities have been impacted by the last three years of teaching. We saw the impact of that on the activities at our school, and parents and the school development community are ecstatic about their children's improvements and selections in multiple competitive exams.

Implication

In Ladakh, higher secondary schools still use the lecture method, which is time-consuming and teacher-centric and largely inhibits students' ability to develop mental skills like creativity and invention. Our three years of investigating and assessing the best instruction have demonstrated that students' growth as exceptionally imaginative, critical thinkers, and innovators is positively impacted when they are more involved and rate the demonstration model and activities higher. In both the board examination and the class test, they did the best. It has an effect on all students' attendance in the classroom as well. In light of this, we would encourage all educators to give this a try in their classrooms. It will definitely affect students, and if it works, it should be implemented. Because this approach is learner-centric, involves more students in the process, and fosters the development of interpersonal and communication skills, it will take some time at first, but in the end, you will enjoy it more and have less work to do. It is also more grounded in reality, which helps educators and learners alike appreciate the value of the practical—something that is frequently absent from our higher secondary curriculum. Ultimately, our learners will exhibit greater engagement, daily attendance, and improved performance in both academics and extracurricular activities. At our school, we finished this assignment, which had a big impact on all of the extracurricular and academic aspects.

CONFLICT OF INTEREST

All authors confirmed that there is no conflict of interest involve with any parties in this work.

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