

An Empirical Study of the Teaching-Learning Environment of the Science Subjects in the CBSE Schools in Dholpur in Rajasthan (With Special Reference to AVM Convent Dholpur)

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Abstract

Dholpur, famous all over the world for its stone, is now one of the most leading educational hubs in Rajasthan where through several schools and coachings every student irrespective of caste, class, religion and sex, is desirous of joining the main stream of education. The educational richness of the district lies in the various types of schools and coachings. In the educational field, the towering feature of the district is Military School Dholpur which has produced several scholars of great eminence since it started. Jawahar Navodaya Vidyalaya is another educational positive feature of the district which imparts education in a healthy environment to the students from the rural background in particular. In the district, there are total 05 CBSE affiliated schools, of which 4 are in Dholpur and 1 is in Mania. The Vardhman Public School Mania is only up to X. However, the other four including the above mentioned Military School and JNV are up to XII. Each of the CBSE schools in the district is imparting education in a healthy environment and is preparing the students to join the main stream of education by proving their academic potential.

The research paper is an empirical study of the teaching-learning environment of the science subjects AVM Convent (CBSE affiliated school) Dholpur. Conducted on 60 randomly selected units of information that include the students, parents, teachers, principal, other staff members and the visitors, the study aims at covering all the possible aspects associated with the teaching-learning environment of the science subjects in the school. The particular focus in the study is on the causes and effects of the students' joining the various science subjects and on the academic environment in the school.

Keywords: Environment, Hub, Refresher Courses, Smart Classes, Equipment, Indifference of The Students, Updation, Ongoing Trends, Bent of The Students, CBSE

Introduction

Teaching science requires special attention and special training of teachers in teaching methods that invoke reasoning and curiosity. It also requires laboratory equipment to let students explore and verify phenomena and learn methods of scientific inquiry. It requires textbooks that make scientific phenomena understandable through systematic exploration. End-chapter exercises in textbooks must not ask recall questions, but demand thinking, reasoning and analysis. The same is true for examinations.

Three Challenges Being Faced by the Science Education In Senior Secondary Schools

1. A serious lack of adequate equipment
2. A serious lack of trained teachers
3. A consensus on what should be taught in school science²

This is our inability to provide schools with labs and equipment to be used while teaching science. Science is knowledge about the material, natural world. It is knowledge produced from systematic observation,

measurement, experimentation, exploration, and speculation and theorisation about natural objects, their properties and their interactions. Whether the topic of forces in Physics or the solubility of substances in water from Chemistry, or germination in Biology, the science curriculum directs attention to the material world, to things and processes in it, about which it would like children to learn—to notice, name and think about things based on concepts and theories that characterise these disciplinary approaches. However, this material world is conspicuously absent in the Indian science classroom and the school.

The science classes are no different from history or geography or language. They are also taught by teachers from textbooks. The textbooks talk about things, experiments and processes and show pictures. They often take the route of not only describing the experiment, but also telling children what they will observe and what they should conclude. Nehru had dreamt of the day when every science classroom would have a microscope and children would have the direct experience of viewing the microscopic world. All of us have studied about the paramecium in our school biology textbooks, which told us that it was a slipper shaped single cell organism. Yet how many of us have viewed a drop of ordinary water through the microscope, learnt to adjust the focus to see this for ourselves? We have all seen pictures in our book of Saturn and its rings. But most likely we have never been asked to look and spot Saturn in the sky and watch it through a pair of ordinary binoculars to see its rings. It is not just a problem of providing infrastructure in schools. Even in private schools which could afford the infrastructure, few school managements actually make this provision.

It is true that there are several other careers, but the careers through the science stream is the first priority to most of the students and their parents. Only very few of the parents in Dholpur permit their children to join arts, commerce, agriculture stream. No doubt, the girls' bent of mind is on the study of arts subjects, but it is just because of the approach of the parents that the girls are meant for the family of their husbands. However, in some of the advanced families, even the girls are forced to study science subjects, to join some good coaching in Kota, to make preparation there, and thus, to build up their career in the field of medicines and engineering. This trend of joining science stream is seen not only in Dholpur but all over Rajasthan. Exceptions of meritorious and successful students are there, but very few. According to the reports of the students studying in the coachings of Kota, most of the students are living under pressure just in order to please their parents. A true school is identified not by its building, but by its teachers, infrastructure facilities and its educational and competitive environment. It is true that in the district, there are several schools, but most of them lack the standards required for enabling the science students to join the main stream.

At present, in the Dholpur district, there are more than 250 schools with the facility of teaching of

Science, Commerce, Arts and Agriculture subjects. In more than 130 of them, there is the facility of the teaching of Science subjects. The number of enrolled Science students in these schools is about 2500. Obviously, the many of the students in the district are interested in the Science stream. Hence, the Government should have a proper strategy so that the students may get what they deserve and what they deserve.

The students are from different family backgrounds. All of them cannot afford the expenses of the studies in the other parts of the country. As a result, only very few of them are able to continue their studies, and most of them fail to make their career in the concerned field. If the facilities of teaching and preparation for the competitions are provided here, they will be able to see their dreams turning into reality. It can be possible only when each of the private and government schools in the district considers its liability to educate and train the students properly.

Dholpur with several private and government schools, colleges and coachings meant for the various competitive examinations held from time-to-time by various agencies, is now an education hub where both the male and female candidates from the various parts of the district can be seen burning midnight oil to seek some good career for them. In the district as a whole, probably, all the popular streams are available for the students. In most of the schools and colleges, besides the arts and commerce streams, there is the Science stream with the teaching facility of Chemistry, Physics, Biology, and Mathematics.

In the Dholpur district, in addition to several private and government schools affiliated to Rajasthan Board of Secondary Education (RBSE), there are- Military School which has produced several great scholars so far since it was opened, Jawahar Navodaya Vidyalaya and three CBSE Schools, of which two are in Dholpur city and one is in Mania.

The modern trend is of Science Stream. Of course, the entire Dholpur district in Rajasthan is making a tremendous contribution in this field. However, still the improvement is required to satiate the curiosity of the Science students, and to prevent them from going to other cities for the sake of higher studies and career in the field.

Objectives of the Study

The study was made with the following objectives:

1. To observe the educational and academic environment of the school.
2. To observe and interpret the academic standard of the teachers appointed in the school to teach the various science subjects to the students at the senior secondary level.
3. To study the infrastructure facilities being provided to the students.
4. To explore and analyze the number of students in the school, and to find out the percentage of the students who have offered Science subjects at the senior secondary level.
5. To be familiar with the causes of the growing interest of the students in Science subjects at the

senior secondary level through the students, teachers, parents and family members, and through the inhabitants of the various localities in Dholpur.

6. To study and analyze the teacher-student ratio in the selected schools
7. To learn through the students about the fields that they want to join as a result of their study of the science subjects.
8. To learn about the result of the Science students of the previous five years in the school.
9. To find out about the socio-cultural and educational background of the science students.
10. To analyze the cause and effect relationship of the students' bent of mind to the study of the science subjects at the senior secondary level.

Review of Literature

Woolnough and Allsop (1985) have suggested three categories which might aid discussion about practical work: exercises, experiences and investigations: Schoolteachers themselves get very keen on new approaches – which in itself is half the battle won – but their enthusiasm is not untinged with scepticism about the value of pupils finding out for themselves in the laboratory... Demands on time mean fewer facts – that is, a lower syllabus content; and that is a price which, in present circumstances, we can afford to go on paying for some time yet as long as we get the right kind of return in the form of minds which are lively and inquiring and not going under in a morass of information. (Jevons, 1969, p. 147)

Wellington (1988) notes that there are 'at least six types of activity' that take place in school science 'that we would probably all class as practical work' (p. 12): teacher demonstrations; class practicals, with all learners on similar tasks, working in small groups; a circus of 'experiments' with small groups engaged in different activities, rotating in a carousel; investigations, organized in one of the above two ways; and problem-solving activities. (p. 12) The different types of activity have different purposes (Gott and Duggan, 1995) but, as Wellington also points out, many 'experiments' are nothing of the sort, not least because no new knowledge is being made.

The authors of the Handbook on Research on Science Education (Abell and Lederman, 2007) provide what they call a classical definition of 'school science laboratory activities' (which it notes are called 'practical activities in British Commonwealth parlance'). Such activities are: learning experiences in which students interact with materials or with secondary sources of data to observe and understand the natural world (for example: aerial photographs to examine lunar and earth geographic features; spectra to examine the 16 nature of stars and atmospheres; sonar images to examine living systems), (Lunetta et al., 2007, p. 394)

The Royal Society's stated position on terminology is that "practical science" is used as shorthand for the full programme of experimental and investigative activities (including fieldwork) conducted as part of science education in schools and colleges'

(House of Lords, 2006, p. 63). However, various terms are in common use in science education to describe different sub-categories of practical work.

It may well be the case that tradition and convenience perpetuate outmoded methods. Dissatisfaction with the large number of science facts (the 'content') in the curriculum and the emphasis on rote learning have driven debates about science education for many years and prompted new approaches to science education in the mid-to-late 1980s (Hodson, 1990; Donnelly and Jenkins, 2001). This shift occurred partly as a result of an increased focus on the processes of science and how they could be taught and assessed. The movement was recognised and accelerated by the publication of Science 5-16: a Statement of Policy (DES, 1985).

Early attempts to focus on the processes of science tended to take an atomistic view of what science involved. For example, the science education research team of the Assessment of Performance Unit, which commenced its work in 1979, devised a set of categories of skills (see, for example, Gott and Murphy, 1987). This atomistic, skills-based approach had an impact on science teaching and on its assessment during the 1980s and 1990s.

Hypothesis

1. At present Dholpur is a hub of education where the various good schools, colleges and coachings of competitive examinations are magnetically drawing the students from far and wide to study here in order to build up their career.
2. In Dholpur, there are several private and government senior secondary schools which are joined by thousands of rural and urban students for the sake of the study of the science subjects.
3. Most of the schools are RBSE affiliated while a few of them are CBSE affiliated
4. The teaching and learning environment in the CBSE schools is more or less different from that in the RBSE schools
5. Most of the schools in Dholpur lack basic infrastructure facilities required for the study of science subjects.
6. The classrooms of the science subjects are overcrowded.
7. The teacher-student ratio in such schools is not proper, and it requires improvement.
8. At present there is the ongoing trend of offering science subjects like Physics, Chemistry, Biology and Mathematics.
9. The posts of these subject teachers are vacant in most of schools.
10. The facility of teaching the science subjects through English medium is not provided in most of the schools.
11. The refresher courses need to be organized for the science teachers in order to update them with the current ongoing trends in the subjects
12. The teachers of the various science subjects are not sent for the refresher courses.
13. The senior secondary schools in Dholpur lack a conducive teaching environment because of the various government schemes and other reasons.

14. The CBSE schools provide a better educational and academic environment than the RBSE schools

Research Methodology

The study was conducted on 60 units associated with the teaching and learning of the Science subjects in AVM. The units whose views and information find room in the study were randomly selected, covering the students, teachers, principal, parents, staff members and even visitors. For the purpose, both the primary and the secondary data were used. The tool which was adopted to collect the primary data was schedule technique with more than 70 questions covering several aspects of the problem. In order to keep up the scientific spirit, observation method was used. The researcher individually observed the conditions under which the students of Science stream in the school study and the teachers teach the various science subjects. Not only this, she also visited the labs and observed herself the various laboratories and the equipments in them. Besides it, some of the persons associated with the selected problem, were interviewed. The mode of sampling was random and stratified. The school was selected in a stratified way, while the units of information were selected randomly.

In order to keep up the scientific spirit of the study, all the steps of research prescribed by the various social scientists, were observed. The conduction of research included review of literature, formation of hypothesis about the problem, selection of the study area of the five varied schools, random selection of the units of information for the purpose of the collection of the primary data, selection of the tool named schedule, pre-testing of the schedule, collection, classification, analysis, interpretation, tabulation of the data, and finally, the generalization. No doubt, the researcher faced much problem while collecting the primary data, but she got over it through her sense of determination and constant endeavours.

Key Findings

1. At present Dholpur is an education hub with the Military School, Jawahar Navodaya Vidyalaya, and three other CBSE schools.
2. In the urban area, Dholpur city has the highest number of Government and Private Senior Secondary Schools (4 and 27 schools respectively).
3. There are qualified teachers to teach the Science students in the schools that provide the facility of teaching Science subjects (91% units).
4. 80% - 100% science teachers in the school are qualified (80% units)
5. Salary to the science teachers is as per norms (61% units)
6. In the school there are only science and commerce streams, but the science stream is more preferred than the commerce stream (61%)
7. The students join the science stream because it is good for career and because it is in demand (60% & 30% respectively)
8. About 80% - 100% of the students in the school are in the science stream.

9. The girls in the science stream in the school are only from 20% - 40%.
10. The rooms available in the school are sufficient for the teaching of science subjects.
11. 80%-100% of the total Science students in the study area are boys
12. Facility of well-equipped laboratories is not there in the school (50% units).
13. Teachers are available to teach all the Science subjects (90% units).
14. Sufficient staff is not available to manage practical labs and to conduct the practicals (61% units).
15. Chemicals and equipments required for conducting practicals are available (30% units).
16. Equipments required for the practicals of Physics are available (69% units).
17. Equipments required for the practicals of Biology are available (35%).
18. Equipments required for the practicals of Chemistry are available (20% units).
19. The units randomly selected are satisfied (56%).
20. The units randomly selected are dissatisfied (35%).
21. Classrooms are both and small, and not entirely modern and well-equipped (60% units).
22. Lecture method is used in the specified school for the teaching of the science subjects (40%).
23. Regular class tests are not conducted for the Science students in the specified study area (70% units).
24. Tests for the Science students in the specified school are conducted monthly (37% units).
25. Regular tests for the Science students are not conducted because the syllabus is too wide (36% units) and the students do not take the tests seriously (47% units).
26. The Science students in the specified study area familiar and unfamiliar with the ongoing trends in the field of Science (30% and 70% units respectively).

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