

# **A study on the availability of science laboratories and use of equipments among the higher secondary schools of Goalpara town**

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## ***Abstract***

*Beyond any doubt, science as a subject is an absolute necessity in the school curriculum. It is the subject that imparts knowledge of established facts, laws and principle which has an extensive effect on the overall development of an individual. Science presents the sum total of the experiences by human beings and relates them to past experiences. In this context, science laboratories have a paramount role to play in imparting science education and developing a scientific attitude among the learners. Quality of science laboratories and the availability of equipment are directly related to the achievement of students. The current study aims at finding out the availability of science laboratories among the higher secondary schools of Goalpara town and makes an analysis on their utilization. The researcher has used her own experiences for the study. The researcher has covered the study's design, analysis and interpretation using appropriate techniques. Standard statistical tools were used for the analysis and interpretation. The researcher's conclusions are purely based on the goals of the study.*

**Keywords:** science, laboratories, availability, shortage, effectiveness.

## **Introduction:**

Science education plays an indispensable role in building a strong and solid foundation for students in their school life. Science is not just a subject, it is a way of thinking and exploring the world around us. It equips students with the knowledge, skills and attitudes that are not only helpful in the classroom but also serves a great purpose outside the classroom in the real world. It helps the students to engage with questioning, investigation and logic from an early age. Science encourages curiosity among pupils and invites them to find answers to the mysteries of the universe. It enhances creativity and innovation in students and helps them to find solutions to real world problems. In today's digital generation, scientific literacy is more important than any other type of literacy. Science education not only involves memorizing mere facts, it involves nurturing minds making them inquisitive and developing critical thinking skills. The importance of proper science laboratories and well maintained science equipment lies in the fact that they make science practical. Science practical are considered to be a key factor in making science teaching and learning more effective and interesting. Science practical classes provide real life experiences to science students and impart science knowledge and skills that are relatively permanent and highly useful. Scientific literacy aims at ensuring a sufficient supply of science graduates for which requires that elementary, secondary and higher secondary schools offer science education that are realistic and inquiry oriented curriculum that engage students and inspire students to continue their education with science. Lack of conducive teaching environment for science is a great problem for students. Lack of adequate science teaching and learning facilities affects the achievement the learning outcomes of students. It has been studied according to many researches that a great portion of students have a low interest in science and subjects related to science. Interest plays an important role in the understanding of a subject. Low interest in a subject will result in low understanding of the knowledge

delivered to them. Lack of proper science laboratories and sufficient equipment, reagents and solutions is also an emerging problem. Students, who always learn science with abstract concepts may not have the proper idea of what the teacher is teaching without practical knowledge.

### **Significance of the study:**

It is an established fact that any course in science does not show its excellence until it is related to practical work and real life experiences. One of the vital aims of the government of India is Universalization of secondary education. For this purpose, huge expenditures have been made on increasing various facilities in secondary schools like classrooms, infrastructure, laboratories, equipment etc. A laboratory activity is a way of learning where the students construct knowledge by doing various activities and at the same time engage in understanding the processes.

The present study focuses on the harms that shortage of science laboratories and equipment causes to science education. The conclusions drawn from the study will facilitate qualitative teaching for teachers. This study is meant to help the authorities associated with science education realize the importance of practical work in science. This study also notifies the problems and the influence it has on the academic achievement of science students.

### **Statement of the problem:**

Considering the importance of practical work in science and its importance in the holistic development of the students, the investigator has selected the following topic for the study “**A study on the availability of science laboratories and use of equipment among the higher secondary schools of Goalpara town**”.

### **Objectives of the study:**

The following objectives have been selected by the researcher for the study:

1. To study the availability of science laboratories for the teaching of science among the higher secondary schools of Goalpara town.
2. To study the role of science practical works in developing scientific attitude in students.
3. To study the effect of utilization of science laboratories on the academic achievement of students in science.

### **Methodology of the study:**

#### **Research design**

The study has been carried out in the area of Goalpara town covering a total area of 1,824 square kilometres. The area is situated at 26.170000° latitude and 90.620003° longitude.

#### **Sampling technique**

The study is conducted using the descriptive survey method. This method is found to be relevant and appropriate for the study. Here, the teachers and students of the higher secondary schools are regarded as the population for the study. For the study, a simple random sampling technique has been adopted. The sample involves 5 CBSE and 5 AHSEC higher secondary schools in the Goalpara town making a total of 10 schools. 10 students and 2 science teachers were randomly selected from each school giving a total population of 100 students and 20 teachers.

## Research instrument

In the present study, a questionnaire consisting of ‘yes or no’ questions have been administered to the students and teachers based on the respective objectives. The questionnaire consists of a total of 15 questions related to the various aspects of science education. The questionnaire used in this study is self-developed.

## Analysis and interpretation of data:

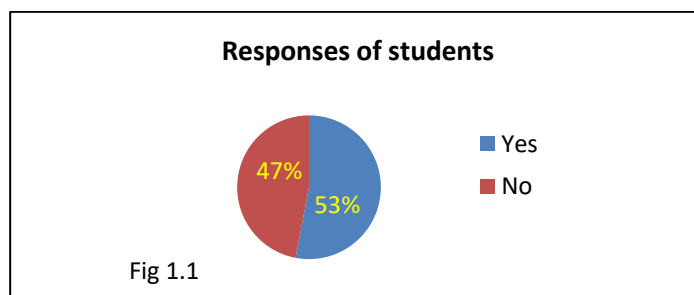
Data interpretation refers to the process of using various statistical and analytical methods to arrive at relevant conclusions. It is important to help researchers to categorize, manipulate and summarize the obtained information in order to answer critical questions.

After obtaining the data, the investigator used quantitative method for analysis and interpretation of the obtained data. The collected data are tabulated and classified for better interpretation. The data has been stated in terms of percentage.

### 1. Availability of separate laboratories for physics, chemistry and biology.

Table 1.1

Response	Number of students	Percentage of students
Yes	53	53%
No	47	47%

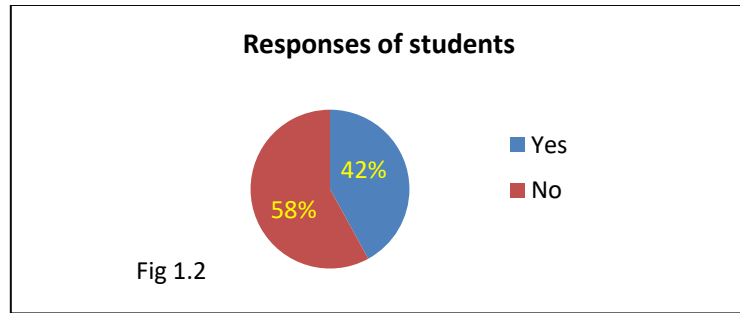


**Interpretation:** Fig 1.1 shows that out of 100 students, 53 students (53%) have answered that they have separate laboratories for physics, chemistry and biology in their schools while 47 (47%) of them replied that they don't have.

### 2. Availability of sufficient apparatus and equipment in the laboratories.

Table 1.2

Response	Number of students	Percentage of students
Yes	42	42%
No	58	58%

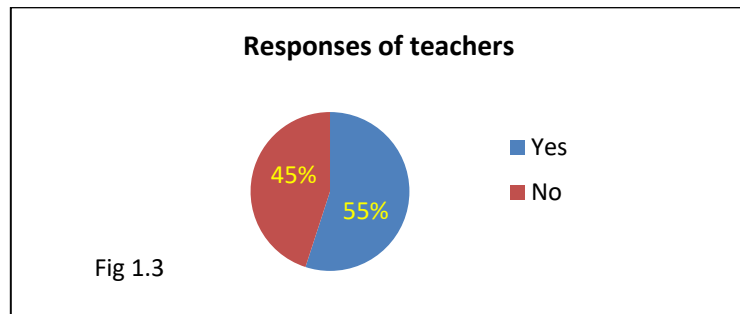


**Interpretation:** Fig 1.2 shows that out of 100 students, 42 students (42%) have answered that they have sufficient apparatus and equipment in the laboratories in their schools while 58 (58%) of them replied that they don't have.

**3. Demonstration before practical classes.**

Table 1.3

Response	Number of teachers	Percentage of teachers
Yes	11	55%
No	9	45%

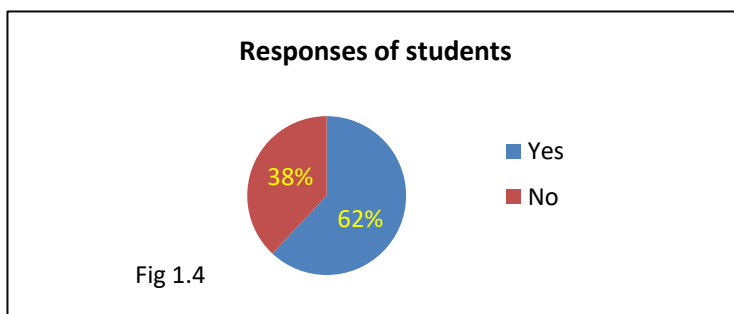


**Interpretation:** Fig 1.3 shows that out of 20 teachers, 11 teachers (55%) have answered that they hold demonstration classes before practical in their schools while 9 (45%) of them replied that they there is no provision for demonstration classes.

**4. Separate practical classes allotted in the time-table.**

Table 1.4

Response	Number of students	Percentage of students
Yes	62	62%
No	38	38%

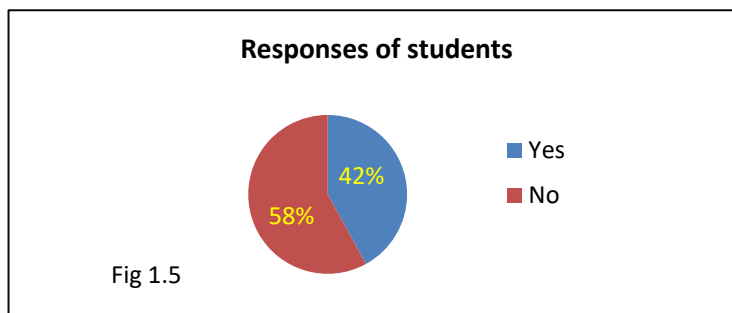


**Interpretation:** Fig 1.4 shows that out of 100 students, 62 students (62%) have answered that they have separate practical classes allotted in their time-table while 38 (38%) of them replied that they there are no separate practical classes allotted in their time-table.

**5. Lab assistants in the laboratories.**

Table 1.5

Response	Number of students	Percentage of students
Yes	42	42%
No	58	58%

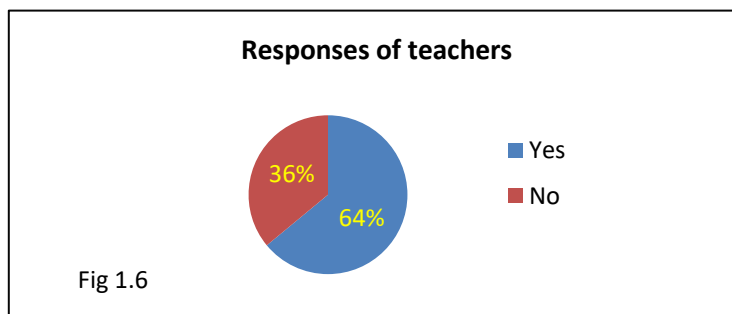


**Interpretation:** Fig 1.5 shows that out of 100 students, 58 students (58%) have replied that they have lab assistants appointed in the laboratories while 38 (38%) of them replied that there are no lab assistants appointed in the laboratories in their schools.

**6. Involvement of science teachers in practical classes.**

Table 1.6

Response	Number of students	Percentage of students
Yes	64	64%
No	36	36%

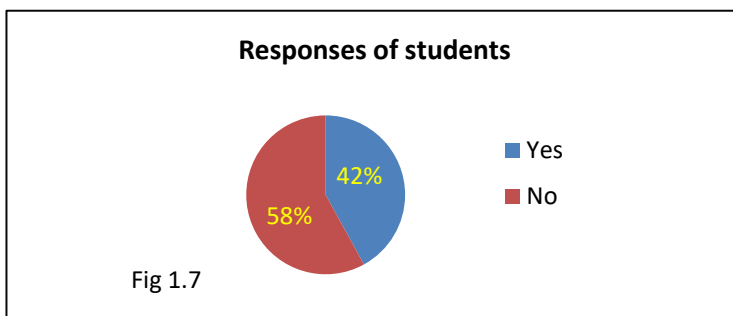


**Interpretation:** Fig 1.6 shows that out of 100 teachers, 64 teachers (64%) have answered that their science teachers guide them during the practical activities while 36 (36%) of them replied that they there is no involvement of science teachers in their practical activities.

### 7. Sufficient time for practical classes

Table 1.7

Response	Number of students	Percentage of students
Yes	42	42%
No	58	58%

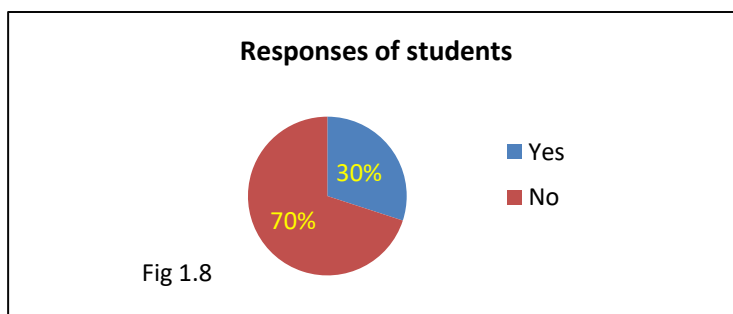


**Interpretation:** Fig 1.7 shows that out of 100 students, 42 students (42%) have answered that the time allotted for the practical classes are sufficient while 58 students (58%) replied that the time is insufficient to complete their practicals.

### 8. Practice before examinations.

Table 1.8

Response	Number of students	Percentage of students
Yes	30	30%
No	70	70%

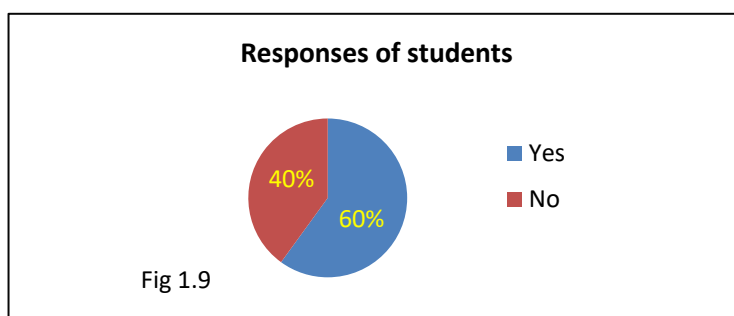


**Interpretation:** Fig 1.8 shows that out of 100 students, 30 students (30%) have answered that there are revision of practicals before the examinations while 70 students (70%) replied that the practicals are not revised before the examinations.

## 9. Separate practical examinations.

Table 1.9

Response	Number of students	Percentage of students
Yes	60	60%
No	40	40%

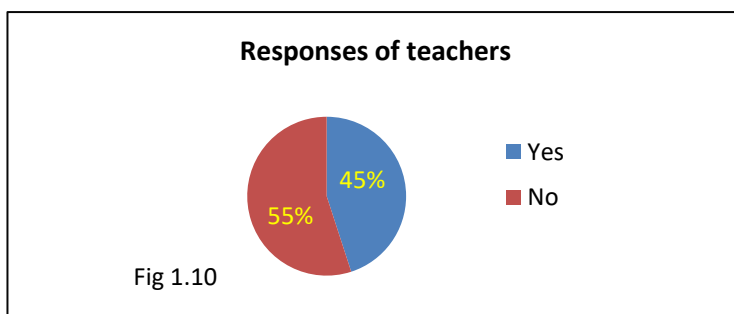


**Interpretation:** Fig 1.9 shows that out of 100 students, 60 students (60%) have answered that separate practical examinations are being held in their schools while 40 students (40%) replied that there are no separate practical examinations.

## 10. Sufficient financial grants.

Table 1.10

Response	Number of teachers	Percentage of teachers
Yes	9	45%
No	11	55%



**Interpretation:** Fig 1.10 shows that out of 20 teachers, 9 teachers (45%) have answered that they receive sufficient financial grants for the infrastructure of laboratories while 11 teachers (55%) replied that there are no such grants sanctioned.

## Major findings of the study

- It has been found in the study that most of the schools have separate laboratories for physics, chemistry and mathematic whereas still an appreciable number of schools do not have separate laboratories.
- In the study, it has been observed that most of the schools do not have sufficient number of equipment in their laboratories.
- It has been found in the study that in most of the schools, demonstration classes are conducted before the practical classes.
- In the study, it has been found that a large number of schools have separate practical classes allotted in the daily time-table.
- Most of the schools have laboratory assistants appointed in their schools while some of the schools do not have laboratory assistants.
- It has been found in the study in most of the schools, the science teachers are actively involved in the practical classes.
- Most of the students feel that the time allotted for the practical classes are not sufficient for them.
- In the study, it has been found that most of the schools do not have practice sessions before the practical examinations.
- It has been found that most of the schools conduct separate practical examinations fairly.
- It has been found in the study that most of the teachers agree that they do not receive regular funding for improving the quality of their laboratories.

## Conclusion

Science experiments teach students observation and experimentation. It teaches students science in a way that they can process. It is one of the most interesting ways to motivate students towards the subject and improve their performance in the subject. Experiments make students more observing and inquisitive. It raises the power of critical thinking and questioning. By experiments, concepts can be taught to students by having experience for themselves. This study investigated the availability and quality of science laboratories in the schools of Goalpara town and found it to be below the mark. There are many schools where there is no laboratories and proper assessment of the practical since, practical work do not contribute directly to the assessment of the children. It is of utmost importance that practicals are made mandatory in science subject and steps are been taken to ensure proper assessment of the examinations.

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