



ATTITUDE OF STUDENTS TOWARDS PRACTICAL AND THE LABORATORY FACILITIES IN SCHOOL

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ABSTRACT Laboratories are considered to be the heart of science education. It is in laboratory that many scientific skills are developed. This study is an attempt to see if there is any correlation between the materials available in the laboratory and in school for practical and the attitude of students towards practical. The study was conducted on 495 student of XI standard of Mathematics and Science group from four Government schools, three Private schools, and four Government aided schools in Coimbatore city. The results of the study revealed that attitude of the students towards practical is not related to the availability of materials in the laboratory.

KEYWORDS

Attitude, Availability, Laboratory materials.

Introduction

We can never imagine a world without science and technology. All our activities are intertwined with the scientific principles and teaching learning process is also not an exception. Science is a subject which always depends upon experimentation and demonstration. Hence practical in science is very important and the practical should create interest among the students to pursue their higher education in science.

Laboratory is a place which is of utmost importance in science education which is considered as a valuable tool in maximizing the learning experiences of both students and teachers. The value of laboratory led education is not only recognized by the academic and private sector but is also highly valued by students themselves, who appreciate the opportunities, contextualization and challenges that laboratory practical offer. (Hofstein & Lunetta, 2004). Having a distinctive role in science curriculum, laboratory activities and experiences are crucial for science learners to comprehend concepts, acquire scientific and problem solving skills, scientific 'habits of mind' as Hofstein and Naaman (2007) stated. Laboratory applications should include activities which allow students to make choices with exploratory actions. They should be learner-centered, comprise before and after experiment studies, exciting experiments that are connected with real-life rather than boring experiments (Feyzioglu, 2009; Hofstein, Navon, Lei, 2006; Stewart, 1988). In their paper about studies on laboratory applications in several countries, Hofstein and Naaman (2007) reported that laboratory applications aim at developing students' scientific processing skills, problem solving skills, and draw their attention and develop positive attitudes towards scientific approaches according to objectives of fundamental science education. Garnett and Hackling (1995), mentioned that the laboratory helps students develop their conceptual understandings, application skills and techniques, interrelations among variables and analyzing skills for chemical analysis and synthesis. They also implied that in order to develop students' research skills which include problem analysis, planning and conducting research, data collection and interpreting findings; laboratory approaches that enable learners to be active participants need to be followed.

Research questions

- Is there a correlation between availability of chemistry laboratory facilities and attitude of students towards chemistry practical?
- Whether the attitude of the students towards chemistry practical differs based on their gender, locale and the type of school in which they study?

METHODOLOGY

Participants

The research was carried out with 495 student of XI standard

of Maths and Science group from four Government schools, three Private schools, and four Government aided schools in Coimbatore city. Of the sample there were 249 male students and 246 female students. 294 students were from rural locality and 201 students belong to Urban set up. Of the total sample 196 students were from Government school 125 from private schools and 174 from Government aided school. Data was collected by survey method. The

Research Instruments

In order to find answers to the two research questions mentioned above, the study used two types of data collection instruments: An attitude scale and a questionnaire

Likert type Attitude scale (3 point) was constructed and validated for assessing the attitude of students towards Chemistry practical. The scale consisted of 29 items after establishing split half reliability(0.77) and face validity and content validity. The scale consisted of both positive as well as negative attitude towards Chemistry practical. In attitude scale for the positive items the score was 3, 2 and 1 for strongly agree, undecided and strongly disagree and the scores were reversed for the negative items. As there are 29 items in the scale the maximum score that could be obtained by an individual was 87 and minimum score was 29.

Questionnaire on availability of laboratory facilities and its utilization (prepared by the investigator).

Questionnaire was prepared to collect details related to the different facilities like equipments, chemistry lab furniture, water facilities and other materials related to chemistry practical. These facilities were classified under different sections like materials needed for salt analysis, titration, and general facilities. 8 items were included in the salt analysis, 7 items were included in the titration and 26 items were included in the general facilities. For the availability of materials questionnaire a score of '1' was given to the item if it was available and '0' if the facility is not available.

Data Collection Procedure

First a rapport was created with the students and the tools were administered one by one by clarifying the doubts if any and the students were asked to fill in the questionnaire and attitude scale. The data collected were scored based on the scoring procedure mentioned in the research instrument and final data was analysed.

Results and Discussion

Table.1. Correlation between Attitude towards practical and availability of materials in the laboratory

Availability of materials	Attitude towards practical
Availability of materials for salt analysis	-0.126

Availability of equipment and materials for titration	-0.025
Availability of General facilities	-0.0112

The correlation coefficient reveals the fact that there is no correlation between the materials available for doing practical and attitude towards practical of students.

Comparison of attitude towards chemistry practical based on gender

Attitude of boys and girls towards chemistry practical were compared by using the t-test and the t-value obtained is given in Table 2.

Table 2. Gender and Attitude towards Chemistry Practical

Gender	N	Mean	SD	df	t value
Male	249	79.638	8.092	493	0.413 ^{NS}
Female	246	79.357	6.990		

NS-Not significant, SD-Standard deviation, df-degrees of freedom, N-number of students.

From Table,2 it is seen that the calculated 't' value was found to be (0.413) which is not significant statistically. Hence we could conclude that there is no significant difference between male and female student on attitude towards practical.

Comparison of attitude towards practical based on locality

Attitude of students from rural and urban area towards practical were compared by using t-test, and the values obtained are given in Table 3

Table.3. Locality and Attitude towards chemistry practical

Locality	N	Mean	SD	df	t-value
Rural	293	79.307	7.179	398	0.666 ^{NS}
Urban	202	79.77	8.086		

NS-not significant, SD-Standard deviation, df-degrees of freedom, N-number of students

It is seen from Table 3 that the t-value obtained (0.666) is not statistically significant. Hence we could conclude that there is no significant difference in the attitude of students based on locality..

Comparison of attitude towards practical based on type of school

Analysis of variance was done to test if there is any significant difference in scientific attitude score among the students belonging to three types of schools namely, Government, Private and Government aided. The results of ANOVA for three groups are given in Table 4.

Table.4 Attitude towards practical based on type of school

Type of school	Mean Score	Source of variation	Sum of squares	df	Mean square	'F' Value
Government	80.748	Between groups	422.923	2	211.461	3.743 ^{**}
Private	78.842	Within groups	27798.83	492	56.5016	
Government Aided	78.788	Total	28221.75	494		

**($p < .01$)

From Table 4, it is observed that 'F' value (3.743) is greater than the critical value (3.01) at 0.01 level. It infers that there exists a significant difference in the attitude towards practical of students based on the type of school they study. The mean scores indicate that students of government school possess more positive attitude towards chemistry practical than students in Private and Government aided school.

Conclusion

Inculcation of attitude towards chemistry practical is one of the objectives of teaching of science that can be achieved only through regular practical work in the laboratory. A student should not be a passive listener but an active worker, an enthusiastic experimenter and a discoverer. If the chemistry laboratory is fully equipped and the facilities are utilized properly, students will develop positive attitude towards chemistry practical.

Reference

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