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## Study Practices of Higher Secondary Students in Relation to Scientific Aptitude

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### Abstract

Studying is a skill and it is an art. Being successful in school requires a high level of study skills. Students must first learn these skills, practice them and develop effectively study practice in order to be successful. Very often the study practice and practices developed and used are not permanent throughout the student life. Good study practices include many different skills: time management, self discipline, concentration, memorization, organization, and effort. Without good study practice, a student cannot succeed. To succeed, students must be able to appropriately assimilate course content, digest it, reflect on it, and be able to articulate that information in written and/or oral form. It is the ability to acquire effective study skills. Many people feel the hours of study are the most important. Scientific aptitude plays a major role in understanding the contents of science subject. It is a special intellectual ability to comprehend scientific facts and knowledge. It is a specific ability which enables the individual to acquire scientific knowledge and understanding through the process of teaching and learning. While teaching any lesson of science subject, particularly Physics, Chemistry and Biology at the Higher Secondary level in the class room. A teacher introduces meaningful and interesting science related activities which arouse the scientific temper and understanding among Higher Secondary Science students. The students are able to grasp in their mind about the science concept, because of the role of Study Practices and Scientific aptitude makes the students to be able to understand, apply, analyse, organize, synthesize, evaluate and create the scientific concepts in a meaningful and purposeful way. Once the students learn with healthy study practices thoroughly the science subject, it makes them easy to perform well in the term examinations. The purpose of this study is to analyse the study practices and scientific aptitude in higher secondary science students. The study adopted a descriptive method with normative survey technique. A sample of 215 higher secondary plus one students was selected in Trichirappalli District as sample for this study by using a stratified random sample technique. The data was analysed by using descriptive, differential and correlation analysis. The study found a significant and positive relationship between study practices and scientific aptitude of Higher Secondary Science students. Further, the study found that the higher secondary boys and girls do not differ significantly in respect of their Study Practices and Scientific Aptitude.

**Keywords:** Study Practices, Scientific Aptitude, Higher Secondary Science Students, and Scientific temper.

### Introduction

“Education means facilitating the mind to find out ultimate truth which is from the bondages of the dust and give us the wealth, not of thing but inner life, not of power but of the love making the truth its own and giving expression to it”. Education helps in the systematization of information and the realization of life's values, and it works tirelessly to progress of the society. It develops the individual who can make significant contributions to science and technology. Education is critical in the advancement of science and technology. Science is both a collection of knowledge and a method for acquiring it. Science teaching and learning which enables the students to develop scientific inquiry, analytical thinking, problem-solving, and decision-making skills among higher secondary students. There are certain factors which influence them by sustaining their science interest, scientific attitude, scientific aptitude creation of good learning environment, and so on. Here the students study practices play a vital role in the improvement of their academic performance in science, particularly Chemistry at higher secondary level an attempt to investigate into the relationship between

### Scientific Aptitude and Study Practices.

In addition to intellectual qualities and their scientific temper among the higher secondary students are considered to have a unique ability and aptitude that helps them in achieving the new objectives. The higher secondary Students with good scientific aptitude can do better scientific activities in a creative and original way, are also observed by teachers at schools by testing and experimentation. It is a unique intellectual talent that allows one to absorb scientific truths and knowledge. It is a skill that allows a person to study and understand scientific concepts through the classroom and laboratory activities. A teacher gives significant and entertaining science related exercises, to the class room while teaching the Science subject. This arouses the student's better knowledge and about the subject understanding, because of the role of scientific aptitude. Higher secondary students are able to grasp the notion of the theoretical and practical lesson in their minds. Students with scientific aptitude are capable of understanding the scientific concepts in a purposeful and meaningful manner.

### Need for the Study

Scientific aptitude can be considered as a specific skill that enables the students to reach the desired degree of accomplishment in science in general and its specialisation in particular. Knowing about scientific aptitude, it's worth asking how this variable affects the teaching and learning process in the field of science and technology. It is also critical that scientific aptitude be developed in the appropriate way in order to improve science education among higher secondary students. Hence the students that are motivated are more likely to do well in their academic activities, by means of healthy study practices at schools and be reviewed at home. There are number of factors that can influence a student's desire to succeed in school. While study practices is one of the variables that support student's scientific aptitude in learning Science, there is also a need to investigate how this factor can be improved among the higher secondary students. Hence, it is paramount important to study 'Study Practices' among Higher Secondary Students in Relation to their Scientific Aptitude.

### Objectives of the Study

The followings are the objectives of the study,

- (1) To find out the level of Study Practices of higher secondary science students.
- (2) To find out whether there is any significant difference in the study practices of higher secondary Science students, with respect to the variable: Gender, Subject group, Locale and Types of Management.
- (3) To find out the level of Scientific Aptitude of higher secondary students.
- (4) To find out whether there is any significant difference in the scientific aptitude of higher secondary Science students, with respect to the following variables: Gender, Subject group, Locale and Type of Management.
- (5) To find out the relationship between Study Practices and Scientific Aptitude among the higher secondary science students.

### Hypotheses of the Study

Based on the above objectives, the following hypotheses are formulated for testing,

- (1) The level of study practices of higher secondary science students is not high.
- (2) There is no significant difference in the study practices mean scores of higher secondary students with respect to Gender, Locale, Subject group and Types of management of schools.
- (3) The level of Scientific Aptitude among higher secondary science student is not high.
- (4) There is no significant difference in the scientific aptitude mean scores of higher secondary science students with respect to Gender, Locale, Subject group and Types of management of schools.

(5) There is no significant relationship between the Study Practices and Scientific Aptitude of Higher Secondary science students.

### **Method of study**

The present study was conducted by adopting a descriptive method with the normative survey. The investigator has used two tools namely "scientific aptitude scale" and "A scale on study practices". Higher secondary Plus one students were selected as the population of the study. Among the population the investigator has selected 215 students from various higher secondary Schools in Tiruchirappalli District by using a stratified random sampling procedure and collected the objective data from the respondents.

### **Statement of the problem**

To be successful in life one should achieve something in his life. To achieve something in his life one needs interest, attitude, aptitude, sincerity and dedication towards work and study. These qualities make one to achieve the aim and goals which he sets for himself. For achieving something, the basis need is to understand the aims and objectives completely. Study practices means the way of studying, whatever systematic or unsystematic, efficient or otherwise the habit that an individual might have formed with respect to their learning activities. In the process of learning, practices way of exercising and practicing their abilities for learning are considered as study habits of learners. The parent of behaviour adopted by students in the pursuit of their studies is considered under the caption of their study practices. Study practices serve as the vehicle of learning. School climate refers to the quality and character of school life. It has been described as "the heart and soul of the school that essence of a school that leads a child, a teacher, and administrator to love the school and look forward to being there each school day." A positive school climate helps people feel socially, emotionally and physically safe in schools. It includes students, parents, and school personal norms, beliefs, relationships, teaching and learning practices, as well as organisational and structural features of the school. According to the national school climate council, a sustainable, positive school climate promotes students academic and social development. Therefore, the investigator made an attempt to investigate into "Study Practices of Higher Secondary Students in Relation to Scientific Aptitude."

### **Operational Definition of Key Terms**

#### **Study Practices**

It refers to the behaviour used when preparing for tests or learning academic material. Study practices means the way of studying whether systematically or unsystematically, efficiently or otherwise. Study can be interpreted as a planned programme of subject mastery. Studying is a skill. Students must first learn these skills, practice them and develop effective study habits in order to be successful. Good study practices include many different skills: time management, self-discipline, concentration, memorization, organization, and effort. To succeed, students must be able to appropriately assimilate course content, digest it, reflect on it, and be able to articulate that information in written and or oral form.

#### **Scientific Aptitude**

A scientific aptitude is a potential for acquiring certain skill of knowledge. Scientific aptitude test performance reflects cumulative influences of a multiplicity of experiences and scientific aptitude tests measure the effects of learning under relatively uncontrolled and unknown conditions. Aptitude is natural talents, special abilities for doing, or learning to do certain kinds of things easily and quickly. A test that measured the reasoning ability, numerical ability, science information and science vocabulary level of the students. Specific scientific aptitude tests also measured "innate capacity" independent of learning.

#### **Higher Secondary Students**

Higher secondary science students are studying plus one and plus two under 10 + 2 + 3 system of education between the age group of 15, 16, and 17 years of age. The researcher considers the students of

Maths and Science groups at plus one level.

### Methodology in Brief

The study was conducted by adopting a descriptive method with normative survey technique. The researcher gave a proper instruction to the respondents and as they have freely responded to the tools administered. The data thus collected from the students were scored, tabulated and analysed by using appropriate statistical techniques viz mean, standard deviation and t – test for this study, a sample 215 plus one students have been selected from various higher secondary schools in Tiruchirappalli District by using a simple random sampling procedure and collected the objective data from the respondents.

### Tools Used

For the purpose of measuring the variables selected for the study, the following tools were used by the Investigator.

1. ‘Scientific Aptitude Scale’ was constructed and standardized by the Investigator.
2. ‘Study Practices Scale’ was constructed and used by the Investigator.

### Statistical Techniques Applied

The hypotheses of the study were tested by making an analysis of the collected data with the following statistical techniques,

1. Descriptive statistics – Mean and Standard Deviation.
2. Differential Statistics – t-test.
3. Relational Analysis – Pearson Product Moment Correlation.

### Data Analysis

#### Hypothesis 1

The level of study practices among higher secondary science students is not high

Table – 1

Mean and Standard Deviation for study practices mean score for the total sample

Variables	N	Maximum	Minimum	Standard Deviation
Study practices	215	105.0	35.0	8.05

The mean and standard deviation for the study practices score of the higher secondary students are presented in the table-3. The maximum possible score in study practices is 105.0. The mean value is found to be 35.0 that is less than 50 percent. Hence the higher secondary science students have less study practices in science. Therefore the null hypothesis is accepted.

#### Hypothesis 2

There is no significant difference in the study practices mean scores of higher secondary students with respect to certain Back ground variables. This hypothesis was tested by using ‘t’ test. The ‘t’ test was computed to find out the significance of difference in the study practices mean scores with respect to certain Back ground variables.

**Table – 2**

**Significance of difference in the study practices mean scores with respect to Gender, Locale, subject group and types of management of schools.**

Background variables	No. of Students	Mean	Standard Deviation	't'values
Male	97	35.68	7.56	5.03**
Female	118	44.21	8.31	
Rural	104	37.86	7.91	3.95**
Urban	91	42.32	8.27	
Maths Group	110	42.06	8.13	0.91 <sup>NS</sup>
Science Group	105	43.12	8.56	
Government	101	38.67	8.05	2.57**
Self-Financing	114	42.94	7.98	

\*\*Significant at 0.01 level.

NS-Not significant at 0.05 level.

Table 2 shows that the calculated 't' value 5.03, 3.95 and 2.57 are greater than the critical value corresponding at the 0.01 level of significance. This implies that the difference in the study practices mean score under consideration is statistically significant with respect to Gender, Locale and types of management of schools. Hence, the null hypothesis is rejected. Therefore, it can be concluded that the higher secondary plus one male and female students, rural and urban area students, government and self-financing schools students differ significantly in respect of their study practices. Further, the higher mean scores of female students, urban students and self-financing school students have better study practices than the male students, rural students and government school students. The students of maths and science groups do not differ significantly in their study practices.

### Hypothesis 3

The level of Scientific Aptitude among higher secondary students is not high

**Table – 3**

**Mean and Standard Deviation for scientific aptitude mean score for the total sample**

Variables	N	Maximum	Minimum	Standard Deviation
scientific aptitude	215	87.0	29.0	7.91

The mean and standard deviation for the scientific aptitude score of the higher secondary students are presented in the table-1. The maximum possible score in scientific aptitude is 87.0. The mean value is found to be 29.0 that is less than 50 percent. Hence the higher secondary students have little aptitude in science. Therefore the null hypothesis is accepted.

#### Hypothesis 4

There is no significant difference in the scientific aptitude mean scores with respect to background variables. This hypothesis was tested by using 't' test. The 't' test was computed to find out the significance of difference in the scientific aptitude mean scores with respect to gender, locale, subject group and types of management.

**Table – 4**

**Significance of difference in the scientific aptitude mean scores with respect to gender, locale, subject group and types of management.**

Background variables	No.of Students	Mean	Standard Deviation	't' values
Male	107	38.32	7.56	7.30**
Female	108	44.56	7.59	
Rural	103	39.8	8.32	3.21**
Urban	112	45.21	8.67	
Maths Group	97	43.68	7.56	1.03 NS
Science Group	118	44.21	8.31	
Government	91	41.82	7.97	4.65**
Self-Financing	124	45.93	8.31	

\*\*Significant at 0.01 level.

NS- Not significant at 0.05 level.

Table 4 shows that the calculated 't' value 7.30 is greater than the critical value 2.51 corresponding to the 0.01 level of significance. This implies that the difference in the scientific aptitude mean score under consideration is statistically significant.

Hence, the null hypothesis is rejected. Therefore, it can be concluded that the higher secondary science students differ significantly in respect of their scientific aptitude. The higher mean scores of female students have better in their scientific aptitude than male students. Further it can be revealed that the higher secondary students of Maths and Science group do not differ significantly in their scientific aptitude.

#### Hypothesis 5

There is no significant relationship between scientific aptitude and study practices among higher secondary plus one students.

This hypothesis was tested by using correlation. The Pearson product moment correlation coefficient was computed to find out the significant relationship between scientific aptitude and study practices among higher secondary students.

**Table – 5**

**Relationship between the Scientific Aptitude and Study Practices of Higher Secondary plus one students.**

Variable	No. of Students	Category	Correlated Values(r)
Higher Secondary Students	215	Scientific Aptitude	0.918
		Study Practices	

Table-5 shows that the coefficient of correlation obtained between scientific aptitude and study practices among plus one higher secondary schools students is 0.918. Hence, there is high positive correlation between them. So the hypothesis is rejected. Therefore, it can be concluded that there is a significant positive relationship between scientific aptitude and study practices among plus one higher secondary schools students.

**FINDINGS OF THE STUDY**

The major findings of the present study are given below,

1. The level of higher secondary students study practices is found to be low.
2. Significant difference is found between male and female students, rural and urban students with respect to study practices. At the same time, No significant difference is found between maths and science groups students. The students who have studied in government and self-financing schools with respect to their study practices. Maths and science groups students do not differ significantly in respect of their study practices.
3. The finding revealed that the level of higher secondary students scientific aptitude is found to be low.
4. Significant difference is found between male and female students in terms of scientific aptitude. No significant difference is found between rural and urban students, maths and science groups students and the students studying in government and self-financing schools with respect to scientific aptitude of higher secondary students.
5. There is significant positive relationship between study practices and scientific aptitude of higher secondary science students .

**RECOMMENDATIONS OF THE STUDY**

Based on the finding of the study, following recommendations have been made through this investigation

- Students with poor study practices can be considered and trained in them to get good practices in science related activities at higher secondary schools.
- Proper care must be taken by parents at home in their wards study practices and at schools by teachers and be created an appropriate learning environment for their study and for practicing it healthily among students to achieve better achievement scores in science.
- Steps must be taken to improve the academic achievement among higher secondary students by regular study practices with confident, time consciousness, self – discipline, concentration, memory and team spirit.
- Attending the regular classes, taking down the notes, active participation, careful listening in the classroom, laboratory experiment and enquiry based teaching benecessary.
- Forming peer discussions, peer tutoring, reading groups to exchange ideas with classmates and senior students and the teachers.
- The teachers should update their knowledge and skills in their respective subject by attending phase to phase orientation / refresher courses be offered by DIET/SCERT/NCERT etc.

- The plus one student of all the higher secondary schools must be offered training programme on science related project work, activities to improve their knowledge and skills towards science.

### **CONCLUSION**

The present study reveals that the higher secondary level students have considerable level of scientific aptitude, and proper study practices. The study reveals certain student related and institutional related variables may be influenced in their academic performance of the students. The scientific aptitude and study practices individually cultivated by them are likely to determine the level of their success. The findings and results are not the end of the problem but just a beginning of the search for innovation. A study practices is something that is done on a scheduled, regular, planned basis and orient them to develop the scientific aptitude with proper. Study practices may be accelerated in enhancing the achievement of the students in science.

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