

Scientific Aptitude among Higher Secondary Students in Relation to Their Study Practices

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Abstract

Scientific Aptitude plays a major role in deep understanding the concepts 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 science lessons at the Higher Secondary level. A teacher introduces science related activities, concepts, interestingly which arouse thescientific temper among students. The higher secondary students are able to grasp in their mind about the science concepts, because of the role of scientific attitude, scientific aptitude makes the students to be able to understand, and analyze the scientific concepts in a meaningful and purposeful creations. Once, the students learn with healthy study practices thoroughly the science subject which makes them easy to perform well in the examinations. The purpose of this study is to critically analyze the relationship between study practices and scientific aptitude of 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 as sample for this study by using a simple random sample technique. The data was analyzed by using descriptive, differential and correlation analysis. The study found a significant positive correlation between scientific aptitude and study practices of Higher Secondary students. The higher secondary boys and girls do not differ significantly in respect of their scientific aptitude and their study practices in

different learning environment.

Keywords: Scientific aptitude, Study practices, Higher Secondary students, and Learning Environment.

Introduction

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 of 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 sprit can do better in their science related activities in a creative way, through careful observation at schools by regular 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 the science related exercises in the classroom while teaching the science subject. This arouses the students better knowledge and about the subject understanding, because of the scientific aptitude. And the higher secondary students are able to grasp the notion of the theoretical and practicum in their mindsets. Students with sound scientific aptitude are capable of understanding the science 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 is worthy meaning 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 their 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 schools. While scientific aptitude is one of the variables that support students study practices in learning science. Therefore, it is felt need to investigate the study practices on science in relation to their scientific aptitude among higher secondary students.

Objectives of the Study

The followings are the objectives of the study,

1. To find out the level of scientific aptitude of higher secondary students.
2. To find out whether there is any significant difference if any, in the scientific Aptitude of higher secondary students with respect to the variables: gender, group of study, locality and type of management.
3. To find out the level of study practices of higher secondary students.
4. To find out whether there is any significant difference if any, in the study practices of higher secondary students with respect to the variables: gender, group of study, locale and type of management.
5. To find out the relationship between Scientific Aptitude and Study Practices among the higher secondary students.

Hypotheses of the Study

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

1. The level of scientific aptitude among higher secondary student is not high.
2. There is no significant difference in the scientific aptitude mean scores of higher secondary students with respect to Gender. Locale, subject group and type of management of schools.
3. The level of study practices of higher secondary students is not high.
4. There is no significant difference in the study practices mean scores of higher secondary students with respect to Gender. Locale, subject group and type of management of schools.
5. There is no significant relationship between the Scientific Aptitude and Study Practices of Higher Secondary students.

Statement of the Problem

To be successful in one's own life, one should achieve something new. To achieve something new one needs interest, attitude, aptitude, sincerity and dedication towards work and study. These qualities make one to achieve the aims and goals which he/she sets for himself/herself. For achieving something, the basic need is to understand the subject of science thoroughly and 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, students study practices are the systematic way of exercising and practicing their abilities for learning. Study practices serve as the vehicle of learning. In school, the students learning and their routine study practices associated with an act of studying and it can be learned and acquired enough knowledge and skills through regular study. Therefore, the investigator made an attempt to investigate into "Scientific Aptitude Among Higher Secondary Students in Relation to their Study Practices"

Operational Definition of Key Terms**Scientific Aptitude**

Scientific Aptitude refers to a potential for acquiring scientific knowledge and skills. The natural talents and special abilities for doing or learning to do certain kinds of things correctly and quickly. It reflects cumulative influences of a multiplicity of experiences. A test that measured the reasoning ability, numerical ability, science information and science process skills of the students.

Study Practices

Study Practices refers to the behaviour used when preparing for tests or for learning study materials. Study practices means the way of studying whether systematically or regularly, Thereby retaining knowledge related to science.

Higher Secondary Students

Higher secondary 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.

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 Inventory' 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 Scientific Aptitude among higher secondary students is not high

Table – 1

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 2

There is no significant difference in the scientific aptitude mean scores with respect to

demographic 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 type of management.

Table – 2

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

Demographic 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
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.

Table 2 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 plus one 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 male and female students, maths and science group students, government and self-financing school students do not differ significantly in their scientific aptitude.

Hypothesis 3

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

Table – 3**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 students have less study practices in science. Therefore the null hypothesis is accepted.

Hypothesis 4

There is no significant difference in the study practices mean scores of higher secondary students with respect to certain demographic 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 demographic variables

Table – 4**Significance of difference in the study practices mean scores with respect to Gender, Locale, subject group and type of management of schools.**

Demographic 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
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.

Table 4 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 scientific aptitude mean score under consideration is statistically significant with respect to Gender, Locale and type 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. The students of maths and science groups do not differ in their study practices.

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 finding revealed that the level of higher secondary student's scientific aptitude is found to be low.
2. 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.

3. The level of higher secondary students study practices is found to be low.

4. 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.

5. There is significant positive relationship between scientific aptitude and study practices of higher secondary 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 be necessary.
- 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 maybe accelerated in enhancing the achievement of the students in science.

REFERENCES

1. Aggarwal,J.C(2005).EducationPolicy in India 1992 and Review2005,Shipra Publications, New Delhi.
2. 2.Aggarwal,J.C(2007).Psychology of learning and development, Shipra Publications. New Delhi.
3. Aqeel Raza& Ahmad Farooq Shah (2011).Impact of Favourite Subject towards the Scientific Aptitude of the students at Elementary Level, Pakistan journal of social science (PJSS),Vol.31,No.1(June 2011),pp.135 – 143.
4. Agarwal,K.K&Aurora,S.(1986),Manual for Scientific Aptitude Test Battery,National Psychological Corporation,Agra.
5. Bhaskara Rao(2000),A comparative study of scientific attitude, scientific aptitude and achievement in biology at secondary level. NCERT Research study in Education, New Delhi.
6. Kalyanaraman.K (2018), Statistical Method for Research, Atlantic Publishers & Distributors (P) Ltd, New Delhi.