Study of Scientific Aptitude and Academic Performance among Senior Secondary Science Students of Haryana State

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Abstract

The present study was undertaken to analyse the scientific aptitude and academic performance of senior secondary science students of Haryana state with respect to school, gender, stream and coaching. The present study also inspected the influence of scientific aptitude on academic performance of senior secondary science students. Total sample of 400 students was selected at random from twenty government and twenty private schools of Haryana state. The tool used for measuring the level of scientific aptitude was Adolescents' Scientific Aptitude Test (ASAT) developed and standardised by Kusum, Satish Kumar and Sumitra Devi (2021). Academic performance was assessed through marks obtained by senior secondary students in 12th board exam. The result of data analysis concluded that school and coaching significantly influenced the scientific aptitude, but gender and stream does not influence the scientific aptitude. Private school students and students taking coaching have more scientific aptitude. Result also revealed that the school, gender and coaching significantly influenced the academic performance but stream does not influence the academic performance. Significant and positive correlation of between academic performance and scientific aptitude was observed. The result revealed that 28 per cent of academic performance is determined and influenced by scientific aptitude.

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Introduction

Modern life is occupied with scientific technology so enormously that every citizen has to have knowledge of science for effective living. In order to enjoy materialistic happiness in this world, one must be acquainted with adequate knowledge of science. A man with scientific aptitude can easily make his life more happy and comfortable.

Traxler (1957) defines aptitude as "a condition, combination of characteristics, set of qualities in an individual which is indicative of the probable extent to which he will be able to acquire some knowledge, skills or composite of knowledge, understanding and skills, such as ability to contribute to art or music, mechanical ability, mathematical ability or ability to read and speak a foreign language under suitable training". "Scientific aptitude is a complex of interacting hereditary and environmental determinants producing pre-disposition or ability in science" (Rao, 1994).

Scientific aptitude is a composite of abilities which is developed through learning or it is a specific intellectual ability which enables the individual to comprehend scientific facts, to acquire scientific knowledge and understanding through teaching-learning process (Nataraj and Manjula 2012). There ought to be a high degree of interest amongst the scholars to browse the scientific literature and grasp the concepts innately. Quality of numerical ability and information about scientific facts can be raised through development of scientific aptitude among the scholars (Gao and Hangsing, 2019). The students, undoubtedly, will be able to grasp various concepts of science as per the level of their scientific aptitude. Rao (1990) clears that scientific aptitude superbly guides the students to know, understand, organise, comprehend, analyse and synthesise the scientific concepts in a much better manner.

Academic performance or academic achievement is the extent to which a student, teacher or institution has attained their short or long-term goals (Steinmayr et al. 2014).

Academic performance of a student is the ability of the student to study and remember the facts and being able to communicate his knowledge orally or in written form in an exam. Educational researchers have investigated various factors that affect the success in learning. One of these factors is scientific aptitude. Developing scientific aptitude amongst our children should be the major aim of science teaching and education.

Rationale of the Study

The investigation entitled, 'Study of Academic Performance of Senior Secondary Students in relation to their Scientific Aptitude, Interest and Metacognitive Skills', has big importance in shaping the nation's future. By analysing the above mentioned independent variables in students who had chosen science at senior secondary level without having

scientific aptitude, scientific interest and metacognitive skills, we can predict the chances of their success or failure as a professional and accordingly they can be suggested to continue higher study in science subject or switch to other subject/ stream/career. The justification of a research project lies on its contribution in predicting students' performance during studies and entire life ahead. The level of student's scientific aptitude, scientific interest and metacognitive skills, determines the academic performance of the students. That is why the investigator was inspired to study the mentioned variables. The results of this research would be beneficial to educational institutions to develop good quality human resource for developing countries. In addition, this research will revolutionise the field of educational guidance and counseling.

Statement of the Problem

Study of scientific aptitude and academic performance among senior secondary science students of Haryana state

Objectives

1. To study scientific aptitude of senior secondary science students with respect to school, gender, stream and coaching.
2. To study academic performance of senior secondary science students with respect to school, gender, stream and coaching.
3. To observe the influence of scientific aptitude of senior secondary science students on academic performance.

Null Hypothesis

1. There is no significant difference in scientific aptitude of senior secondary science students with respect to school, gender, stream, coaching.
2. There is no significant difference in academic performance of senior secondary science students with respect to school, gender, stream, coaching.
3. There is no influence of scientific aptitude of senior secondary science students on academic performance.

Delimitation of the Study

Four hundred students of Class XII from science stream enroled in Board of School Education Haryana was the sample of the study and scientific aptitude, academic performance, school, gender, stream and coaching were taken as variables.

Research Methodology

The investigator has adopted descriptive survey method for the conduction of his study.

The sample of 400 science students studying in Class XII was selected using multistage random sampling technique. Twenty government and twenty private schools affiliated to Board of School Education Haryana and 10 students from each selected school were selected randomly so as

Sample Design

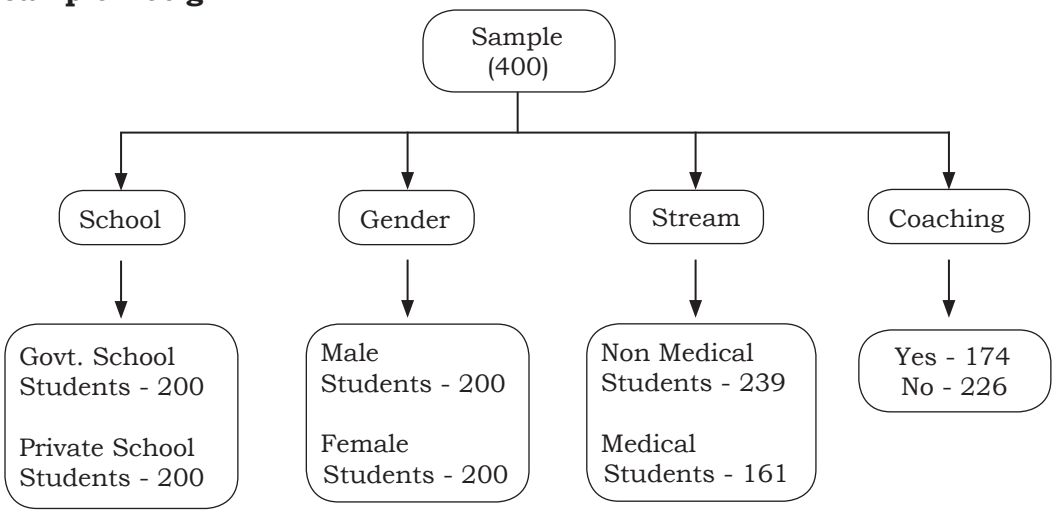

Fig. 1: Distribution of sample

to make a total data collection of 400 students.

Tool Used

1. Adolescents' Scientific Aptitude Test developed and standardised by Kusum, Satish Kumar and Sumitra Devi (2021) was used to study the scientific aptitude of senior secondary science students.
2. Academic performance was determined on the basis of marks obtained by senior secondary science students in Class XII board exam.

Analysis and Interpretation of Data

Statistics like mean, standard deviation and t-test was employed to ascertain the significance of difference of scores of scientific aptitude and academic performance with respect to school, gender, stream and coaching. Relationship between scientific aptitude and academic performance was studied by computing the Pearson's Product Moment Coefficient of Correlation (r).

To Study Scientific Aptitude of Senior Secondary Science Students with respect to School, Gender, Stream and Coaching

Study of Scientific Aptitude of Senior Secondary Science Students with respect to School

It is revealed from Table 1 that mean scores of scientific aptitude of government and private school students are 26.12 and 31.43 with S.D's 7.41 and 9.29 respectively. The computed t-value of 6.320 for the scores of scientific aptitude of government and private school students is found significant at both the level of significance, i.e., 0.05 and 0.01. Therefore, null hypothesis—

Table 1: Differences in Scientific Aptitude of Government and Private School Students

Variable	School	N	Mean	S.D.	p-value	t-value	Level of Significance
Scientific Aptitude	Government	200	26.12	7.41	0.000	6.320	0.05 and 0.01 Significant
	Private	200	31.43	9.29			

N = 400, df = 398

'There is no significant difference in scientific aptitude of senior secondary science students with respect to school' is rejected. So, it is stated that there exists a significant difference in scientific aptitude of government and private school students. Higher mean score value of private school students shows better scientific aptitude of students studying in private school than the students studying in government school.

Study of Scientific Aptitude of Senior Secondary Science Students with respect to Gender

It is revealed from Table 2 that mean scores of scientific aptitude of male and female students are 29.19 and 28.35 with S.D's 9.31 and 8.27 respectively. The computed t-value of 0.954 for the scores of scientific aptitude of male and female students is not found significant at both the level of significance, i.e., 0.05 and 0.01. Therefore, null hypothesis — 'There is no significant difference in scientific aptitude of senior secondary science students with respect to gender' is accepted. It shows that there is no significant difference in scientific aptitude of male and female students.

Study of Scientific Aptitude of Senior Secondary Science Students with respect to Stream

It is revealed from Table 3 that mean scores of scientific aptitude of non-medical and medical students are 29.38 and 27.86 with S.D's 8.65 and 8.98 respectively. The computed t-value of 1.695 for the scores of scientific aptitude of non-medical and medical is not found significant. Therefore, null hypothesis—'There is no significant difference in scientific aptitude of senior secondary science students with respect to stream' is accepted. It shows that there is no significant difference in scientific

Table 2: Differences in Scientific Aptitude of Male and Female Students

Variable	Gender	N	Mean	S.D.	p-value	t-value	Level of Significance
Scientific Aptitude	Male	200	29.19	9.31	0.341	0.954	0.05 and 0.01 Not Significant
	Female	200	28.35	8.27			

N = 400, df = 398

Table 3: Differences in Scientific Aptitude of Non-medical and Medical Students

Variable	Stream	N	Mean	S.D.	p-value	t-value	Level of Significance
Scientific Aptitude	Non-Medical	239	29.38	8.65	0.091	1.695	0.05 and 0.01 Not Significant
	Medical	161	27.86	8.98			

N = 400, df = 398

aptitude of non-medical and medical students.

Study of Scientific Aptitude of Senior Secondary Science Students with respect to Coaching

It is revealed from Table 4 that mean scores of scientific aptitude of students taking coaching and not taking coaching are 30.28 and 27.61 with S.D's 8.42 and 8.93, respectively. The computed t-value for the scores of scientific aptitude of students taking coaching and not taking coaching is 3.033 and is significant. Therefore, null hypothesis—'There is no significant difference in scientific aptitude of senior secondary science students with respect to coaching' is rejected. So, it is stated that there exists a significant difference in scientific aptitude of students taking coaching and not taking coaching. Higher mean score value of students taking coaching shows better scientific aptitude of students taking coaching than the students not taking coaching.

Comparative Analysis of Scientific Aptitude with respect to School, Gender, Stream and Coaching

Comparison of t-value

It is illustrated in Figure 2, that there is a significant difference in scientific aptitude of senior secondary students with respect to school (government and private) and coaching (taking coaching and not taking coaching), but there is no significant difference with respect to gender (male and female) and stream (non-medical and medical).

Comparative analysis of Mean Score of Scientific Aptitude

It is illustrated in Figure 3, that the mean score of private schools students and students taking coaching is significantly higher than the mean score of government schools students and students not taking coaching, which shows that the scientific aptitude of private schools students

Table 4: Differences in Scientific Aptitude of Students Taking Coaching and Not Taking Coaching

Variable	Coaching	N	Mean	S.D.	p-value	t-value	Level of Significance
Scientific Aptitude	Yes	174	30.28	8.42	0.003	3.033	0.05 and 0.01 Significant
	No	226	27.61	8.93			

N = 400, df = 398

and students taking coaching is better than their counterparts. But there is no significant mean difference in scientific aptitude of male and female students and non medical and medical students.

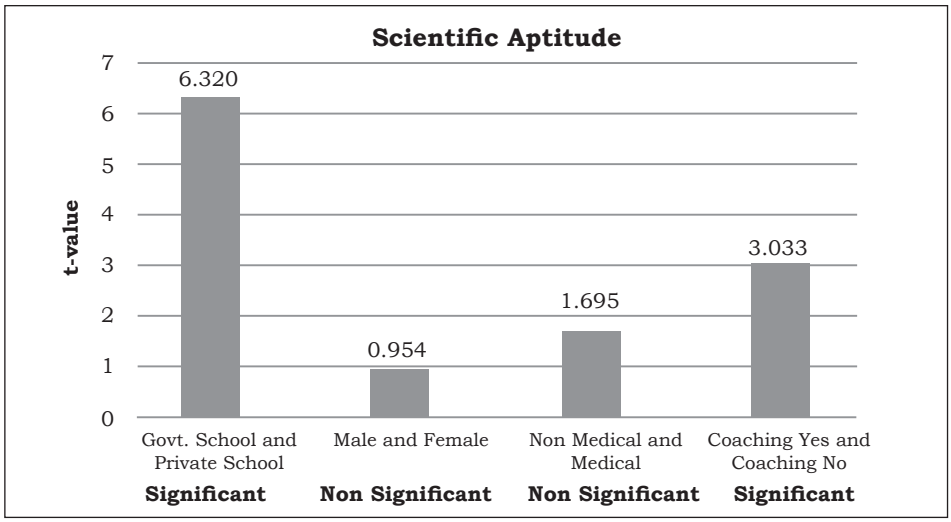

Fig. 2: Showing comparison of t-value of scientific aptitude with respect to school, gender, stream and coaching

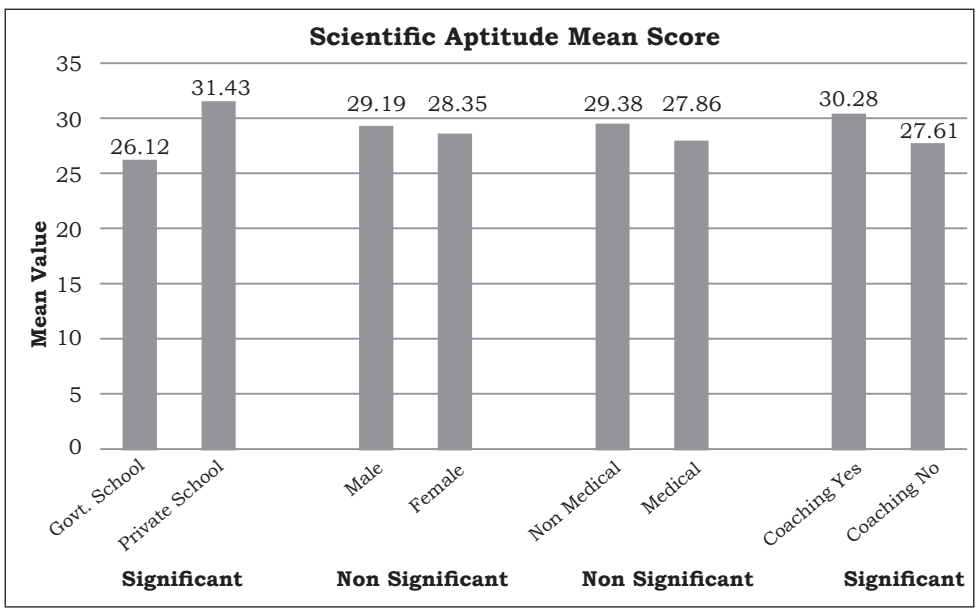

Fig. 3: Comparative analysis of mean score of scientific aptitude of government and private school students, male and female students, non-medical and medical students and students taking and not taking coaching

To Study Academic Performance of Senior Secondary Science Students with respect to School, Gender, Stream and Coaching

Study of Academic Performance of Senior Secondary Science Students with respect to School

It is revealed from Table 5 that mean scores of academic performance of government and private school students are 363.53 and 388.92 with S.D's 56.33 and 58.59, respectively. The computed t-value (4.419) for the scores of academic performance of government and private school students is found significant. Therefore, null hypothesis—'There is no significant difference in academic performance of senior secondary science students with respect to school' is rejected. So, it is stated that there exists a significant difference in academic performance of government and private school students. Higher mean score value of private school students shows better academic performance of students studying in private school than the students studying in government school.

Study of Academic Performance of Senior Secondary Science Students with respect to Gender

It is revealed from Table 6 that mean scores of academic performance of male and female students are 359.59 and 392.86 with S.D's 60.04 and 52.62, respectively. The computed t-value (5.895) for the scores of academic performance of male and female students is found significant. Therefore, null hypothesis—'There is no significant difference in academic performance of senior secondary science students with respect to gender' is rejected. It shows that there exists a significant difference

Table 5: Differences in Academic Performance of Government and Private School Students

Variable	School	N	Mean	S.D.	t-value	Level of Significance
Academic Performance	Government	200	363.53	56.33	4.419	0.05 and 0.01 Significant
	Private	200	388.92	58.59		

N = 400, df = 398

Table 6: Differences in Academic Performance of Male and Female Students

Variable	Gender	N	Mean	S.D.	t-value	Level of Significance
Academic Performance	Male	200	359.59	60.04	5.895	0.05 and 0.01 Significant
	Female	200	392.86	52.62		

N = 400, df = 398

in academic performance of male and female students. Higher mean score of female students shows better academic performance of female students than male students.

Study of Academic Performance of Senior Secondary Science Students with respect to Stream

It is revealed from Table 7 that mean scores of academic performance of non-medical and medical students are 376.44 and 375.90 with S.D's 60.69 and 56.03, respectively. The computed t-value (0.090) for the scores of academic performance of non-medical and medical students is not significant. Therefore, null hypothesis—'There is no significant difference in academic performance of senior secondary science students with respect to stream' is accepted. It shows that there is no significant difference in academic performance of non medical and medical students.

Study of Academic Performance of Senior Secondary Science Students with respect to Coaching

It is revealed from Table 8 that mean scores of academic performance of students taking coaching and not taking coaching are 398.95 and 358.72 with S.D's 44.14 and 62.64 respectively. The computed t-value (7.529) for the scores of academic performance of students taking coaching and not taking coaching is found significant. Therefore, null hypothesis—'There is no significant difference in academic performance of senior secondary science students with respect to coaching' is rejected. It shows that there exists a significant

Table 7: Differences in Academic Performance of Non-Medical and Medical Students

Variable	Stream	N	Mean	S.D.	t-value	Level of Significance
Academic Performance	Non Medical	239	376.44	60.69	0.090	0.05 and 0.01 Not Significant
	Medical	161	375.90	56.03		

N = 400, df = 398

Table 8: Differences in Academic Performance of Students Taking Coaching and Not Taking Coaching

Variable	Coaching	N	Mean	S.D.	t-value	Level of Significance
Academic Performance	Yes	174	398.95	44.14	7.529	0.05 and 0.01 Significant
	No	226	358.72	62.64		

N = 400, df = 398

difference in academic performance of students taking coaching and not taking coaching. Higher mean score of students taking coaching shows better academic performance than the students not taking coaching.

Comparative analysis of Academic Performance with respect to School, Gender, Stream and Coaching

Comparison of t-value

It is illustrated in Figure 4 that there is a significant difference in academic performance of senior secondary students with respect to school (government and private), gender (male and female) and coaching (taking coaching and not taking coaching), but there is no significant difference with respect to stream (non medical and medical).

Comparative Analysis of Mean Score of Academic Performance

It is illustrated in Figure 5 that the mean score of private schools students, female students and students taking coaching is significantly higher than the mean score of government schools students, male students and students not taking coaching, which shows that the academic performance of private school students, female students and students taking coaching is better than their counterparts. But there is no significant mean difference in

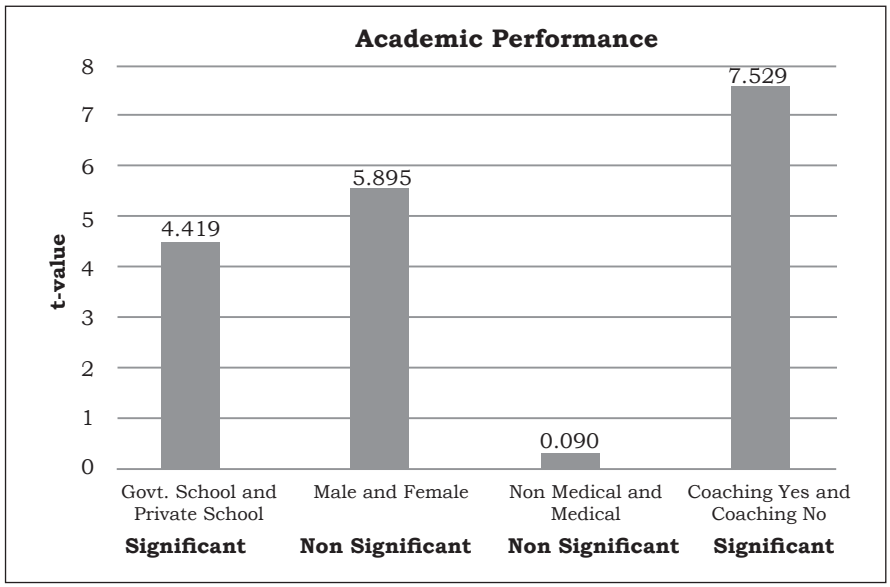

Fig. 4: Showing comparison of t-value of academic performance with respect to school, gender, stream and coaching

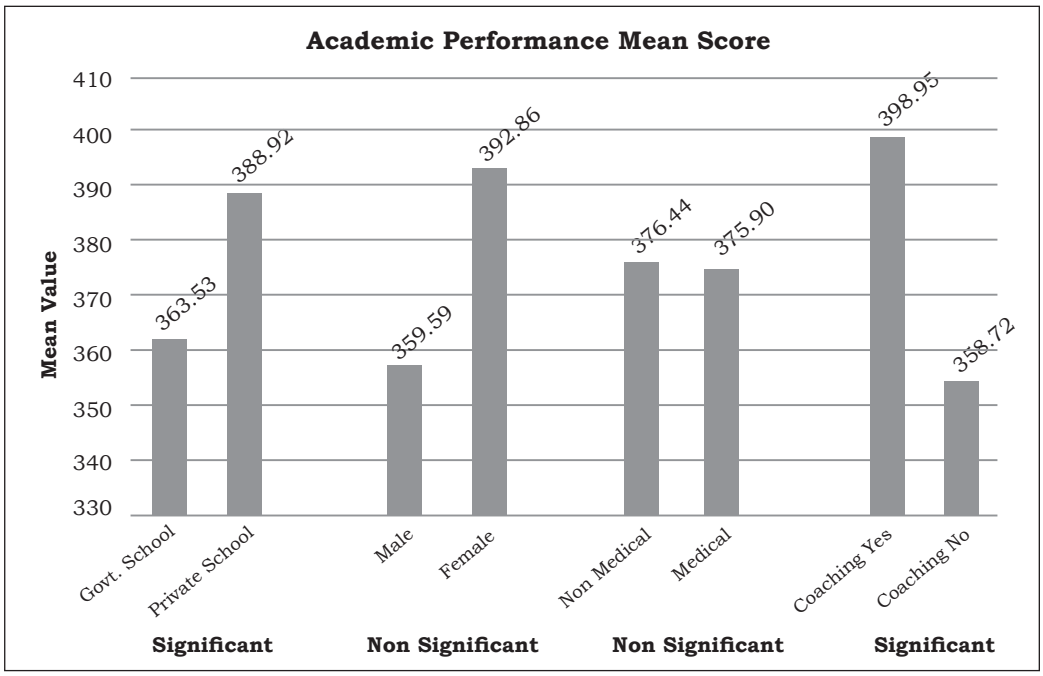

Fig. 5: Comparative analysis of mean score of academic performance of government and private school students, male and female students, non-medical and medical students and students taking and not taking coaching

academic performance of non-medical and medical students.

To observe the influence of Scientific Aptitude of Senior Secondary Science Students on Academic Performance

It is depicted from Table 9 that computed value of coefficient of correlation between academic performance and scientific aptitude is 0.524. Computed (r) value is found greater than table (df 398) value at both 0.05 and 0.01 level of significance, so correlation (r) value is significant at both levels of significance. It shows that academic performance and scientific aptitude have positive and significant relationship with each other which indicates that increase in scientific aptitude leads to increase in academic performance. F value is also significant. Value of R Square (0.275) indicates that scientific aptitude explains 28 per cent of variability of academic performance that is 28 per cent of academic performance is influenced and determined by scientific aptitude. Therefore, null hypothesis—'There is no influence of scientific aptitude of senior secondary science students on academic performance' is rejected.

Table 9: Relationship Between Academic Performance and Scientific Aptitude

Variables	N	Mean	S.D.	Correlation Coefficient (R)	R Square	Percentage contribution	F	Level of Significance
Academic Performance	400	376.22	58.79	0.524	0.275	28%	151.036	0.05 and 0.01 Significant
Scientific Aptitude	400	28.77	8.80					

N = 400, df = 398

It is concluded that scientific aptitude is a powerful determinant of academic performance of senior secondary science students.

Findings

- Scientific aptitude of students studying in private school was found better than the students studying in government school.
- There is no significant difference in scientific aptitude of male and female students.
- There is no significant difference in scientific aptitude of non-medical and medical students.
- Scientific aptitude of students taking coaching was found better than the students not taking coaching.
- Academic performance of students studying in private school was found better than the students studying in government school.
- Academic performance of female students was found better than the male students.
- It was found that there is no significant difference in academic performance of non medical and medical students.
- Academic performance of students taking coaching was found better than the students not taking coaching.
- In this study it was also found that 28 per cent of academic performance is influenced and determined by scientific aptitude and it is interpreted that scientific aptitude is the powerful determinant of academic performance of senior secondary science students.

Discussion

The present study is an attempt to examine the differences in scientific aptitude of government and private school students, male and female students, non-medical and medical students and students taking coaching and not taking coaching.

Significant difference in scientific aptitude of government and private school students was found. Scientific

aptitude of students studying in private school was found better than the students studying in government school. Jai Parkash and Hooda (2019) also reported that scientific aptitude of private secondary school science instructor was more than government secondary school science instructure. In current study, it was found that there is no significant difference in scientific aptitude of male and female students. No difference in scientific aptitude of male and female students can be explained by analysis of the biological capacities of human brain, which is same for male and females of human. Kaur (2013) also reported no important distinction between the male and female students with respect to scientific aptitude. The no difference in scientific aptitude on the basis of stream (medical or non-medical) can be explained because stream could not affect the scientific aptitude once it had been preferred by the students because both non-medical and medical streams are discipline of science. Scientific aptitude of students taking coaching was found significantly higher than the students not taking coaching. Florko et al. (2010) reported that the coaching increased the aptitude test score.

Academic performance of students studying in private school was found significantly higher than the students studying in government school. The findings of the present study were in concordance with previous studies. Wangoo and Khan (1991) also reported that the students from public and private schools differ in academic achievement due to their social and economic status. Academic performance of female students was found higher than the male students. Nayar and Visweswaran (1966) reported the same finding that there was significant distinction in the achievements of urban male and female students of Class X. Vijayalaxmi and Natesan (1992) reported a significant gender distinction in academic achievement and female students were better in academic achievement as compared to male students. Kalaivani (2018) reported higher mean score of female students as compared to the male students in their scholastic achievement. In current investigation it was found that there is no significant difference in academic performance of non-medical and medical students. The no difference in academic performance on the basis of stream (medical or non-medical) can be explained because both non-medical and medical streams are discipline of science and students choose the science stream because of their interest in science or we can say interest of the student in their subject influence the academic performance instead of streams. Academic performance of students taking coaching was found better than the students not taking coaching. Gafoor et al., (2007) reported the similar results that there was an important distinction in achievement in science of students belonging to

coaching and non-coaching teams. According to Mitchell et al., (2016) academic coaching has been found to be effective in enhancing student success. Robinson and Gahagan (2010) reported improvement in students' academic success using a coaching framework of self assessment, reflection, and goal setting.

It was found that there is a significant and positive relationship between academic performance and scientific aptitude. Significant influence of scientific aptitude on academic performance was found. The positive relationship was also reported by most of the previous studies. Rao (1990) investigated 'The relationship among scientific attitude, scientific aptitude and achievement in Biology of secondary students'. Aptitude, attitude and achievement were found to be considerably correlated with each other. Kumar (2013) reported that there was a big correlation in scientific aptitude and educational accomplishment. Leo Stanly (2016) also reported a moderate positive relationship between scientific aptitude and the level of performance in science. Mehna (1986) suggested that scientific knowledge and aptitude is the most important factor for determining the students' performance in science subjects. It was also found that 28 per cent of academic performance is influenced and determined by scientific aptitude and it is interpreted that scientific aptitude is the most significant predictor of academic performance of senior secondary science students. Gao and Hangsing (2019) conducted a study on scientific aptitude and academic achievement of tribal students. Their finding showed that different dimensions of scientific aptitude like reasoning, numerical ability and scientific vocabulary shows moderate direct correlation with accomplishment in science.

Conclusion

It was concluded that scientific aptitude of students studying in private school and students taking coaching was better than their counterparts. But no significant difference in scientific aptitude was found with respect to gender and stream.

The conclusion of the study indicated that academic performance of students studying in private school, female students and students taking coaching was found better than their counterpart. But there was no significant difference in academic performance of non-medical and medical students.

The study concluded the significant and positive relationship between academic performance and scientific aptitude. It is interpreted that scientific aptitude is the most significant influencer of academic performance of senior secondary science students.

Educational Implications

Findings of this research may help in understanding the scientific aptitude of a student and accordingly can be guided to adopt a profession related to the field of science. Achievement in science of a child largely depends upon his aptitude in science. Therefore, in order to develop scientific aptitude in students' right from the beginnings, care must be taken by parents and teachers to identify the aptitude of students in an early age. Teacher should use drill and practice to fix up the science concepts for better learning.

As government school students were found to have low scientific aptitude, the associated reasons and problems should be explored to improve the scientific aptitude of government school students. School authorities, parents and teachers ought to help and encourage government school students. In present study, students who have taken coaching scores high in both scientific aptitude test and Class XII board exam. Parents and teachers should identify the students' special and personalised need of coaching.

As boys were found academically weak, the associated reasons and problems should be explored to improve academic performance of boys. Teachers and parents can make efforts to recognise the troubles which were liable for low academic achievement and then corrective actions should be undertaken to get better academic performance.

Scientific aptitude plays an important role in the academic performance of the students. Identification of aptitude at an early stage will help in utilising the potentials of students. Counseling by aptitude testing and interactive grouping can be more effective than personal characteristics of the students, for improving aptitude capabilities.

This research will suggest that in order to encourage more students in science, intervention need to be designed that focus not only on the academic performance of the students but also on how to make science related occupations more interesting for the senior secondary students. This type of intervention should start early in the academic careers for these students.

References

Florko, L. and O'keefe. 2010. *Practice and Coaching Effects: Examining Coaching and Retest Effects on Aptitude Tests* (ISBN: 978-0-494-68827-4) [Doctoral dissertation, Saint Mary's University]. https://www.researchgate.net/publication/332653331

Gafoor, K. and M. Sunnummel. 2007. Effect of Private Tuition on Achievement in Science of Secondary School Pupils. *Journal of Community Guidance and Research.* Vol. 24, No. 3. pp. 316–325.

Gao, Y. and E. Hangsing. 2019. Scientific Aptitude and Academic Achievement: A Study on Tribal Students. *International Journal of Scientific and Research Publications.* Vol. 9, No. 11. pp. 246–249.

Jai Parkash and S. Hooda. 2019. A Study on Scientific Aptitude of Government and Private Secondary schools Science Teachers of Sirsa District. *International Journal of Research in Economics and Social Sciences.* Vol. 9, No. 3. pp. 27–36.

Kalaivani, S. 2018. Gender Difference in Achievement in Chemistry and Scientific Aptitude of Higher Secondary School Stuents. *Paripex- Indian Journal of Research.* Vol. 7, No. 12. pp. 49–50.

Kaur, N. 2013. Scientific Aptitude and Intelligence as Correlates of Performance of Students in Pre Medical Entrance Test. *International Journal of Research in Education Methodology.* Vol. 2, No. 3. pp. 172–176.

Kumar, D. 2013. *Effect of scientific attitude and scientific aptitude on the academic achievement in science subject of class x students in east khasi hills district of Meghalaya* [Unpublished doctoral dissertation]. North-Eastern Hill University.

Kusum, Kumar, S. and S. Devi. 2021. Manual for Adolescents' Scientific Aptitude Test. Agra: National Psychological Corporation.

Leo Stanly, S. 2016. Scientific Aptitude and Achievement in Science of IX standard students in Puducherry region. *Paripex- Indian Journal of Research.* Vol. 5, No. 2. pp. 290–291.

Mehna, V. H. 1986. An investigation into some factors affecting academic achievement in science of standard IX students of Greater Bombay. *Fourth Survey of Research in Education*, New Delhi: NCERT. Vol. 1. pp. 737–738.

Mitchell, J. Joshua, T. Gansemer, M. Ann. 2016. Academic Coaching and Self Regulation: Promoting the Success of Students with Disabilities. *Journal of Postsecondary Education and Disability.* Vol. 29, No. 3. pp. 249–256.

Nataraj, P. N. and G. Manjula. 2012. A Study on Scientific Aptitude of High School Students in relation to their Achievement in Science Subject. *Indian Streams Research Journal.* Vol. II, No. 9. pp. 2250–7850.

Nayar, P. and H. Visveswaran. 1966. A comparative study of the achievement in general science of urban and rural students studying in X class in the high schools in Coimbatore district. *Journal of Educational Research and Extension.* Vol. 2, No. 3. pp. 20.

Rao, D. B. 1990: A Comparative Study of Scientific Attitude, Scientific Aptitude and Achievement in Biology At Secondary School Level. *In Buch, M.B. Fifth survey of Educational Research,* New Delhi: NCERT. Vol. II. pp. 354–369.

———. 1994. *Scientific Aptitude.* Ashish Publishing House.

Robinson, C. and J. Gahagan. 2010. In practice: Coaching students to academic success and engagement on campus. *About Campus.* Vol. 15, No. 4. pp. 26–29.

Steinmayr, R., A. Meissner, A. F. Weidinger and L. Wirthwein. 2014. Academic Achievement. *Oxford Bibliographies.* pp. 1–16, 10.1093/obo/9780199756810-0108

Traxler, E. 1957. Reviews of the book *Techniques of Guidance*, by Arthur. Harper and Brothers, xiii, pp. 374.

Vijayalaxmi, N. and H. Natesan. 1992. Factors influencing academic achievement. *Research Highlights.* Vol. 2, No. 62. pp. 22–39.

Wangoo, M. L. and M. A. Khan. 1991. Socio economic status and academic achievement: A comparative study of Govt. and Pvt. School students. *Indian Psychology Review.* Vol. 36, No. 2. pp. 1–10.