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Research Article

Science Learning Skills, Socio-Economic Status And Academic Achievement In Science Among Students At The Secondary Level

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ABSTRACT

The present study investigates the relationship between Science learning skills, socio-economic status and academic achievement in Science among students at the secondary level. Survey method is used to select a sample of 618 students at the Secondary level. The research tools used are academic achievement in Science and Vasanthi's Adaptation of Kuppuswamy's Socio-economic Status Scale (Vasanthi, 1991).The results of the statistical analyses show a significant correlation of Science learning skills, socio-economic status and academic achievement in Science among students at the secondary level. No significant difference was observed among students at the secondary level pertaining to their Science learning skills, socio-economic status and academic achievement in Science among students at the secondary level

Keywords: Science learning skills, Socio-economic status, Academic Achievement and Secondary level

1. Introduction

Nowadays, learning of Science becomes very important and unlike before they can learn Science in a more interactive way as the usage of information and communication technology is highly encouraged. Moreover, learning Science is also very beneficial as it has been linked with other subjects such as History, Geography, Mathematics, English and other languages. This will certainly help the children in so many ways as they get to learn many things at a time.

Teachers should try to make learning of Science as an enjoyable experience and the one that the children will remember for a life time because we must be aware that learning Science is an on-going process and it will continue even when these children have step out of the primary school. Therefore, it is definitely a wise move to help these children to understand the importance of Science and the significance of learning Science. Under such circumstances it becomes important to investigate the learning of Science by children, who are the potent citizens of tomorrow.

2. Need for the Current Research

Science teaching and learning should empower children to feel confident that what they already know is an excellent starting point for all that they will learn. They should see their own contribution to the class a means of strengthening the whole. The power children will feel as Science investigators and experimenters can carry over into other subjects. Science can help children to identify the present knowledge they possess from life experiences and apply it to subject matter they are beginning to learn. This knowledge gained from Science of how to investigate problems or search for answers is bound to help students have more confidence when learning becomes more challenging for them in another subject. The act of scientific inquiry can be a key to help students unlock doors and drive their own learning in all subjects. Thus, a need is felt to investigate the factors contributing to the learning of Science among students at the secondary level in which the students are at a very crucial formative stage.

3. Review of Related Literature

Studies reviewed pertaining to the present study have been compiled and presented below under appropriate headings.

3.1 Studies Related to Science learning skills and Academic Achievement in Science

Gurses and others (2007) aimed to investigate the effectiveness of a problem-based learning (PBL) approach in a physical chemistry laboratory course. The parameters investigated were students' attitudes towards a chemistry laboratory course, scientific process skills of students and their academic achievement. The design of the study was one group pre-test-post-test. Four experiments, covering the topics adsorption, viscosity, surface tension and conductivity were performed using a PBL approach at Ataturk University. Each experiment was done over a three week period. A total of 40 students, 18 male and 22 female, participated in the study. Students took the Physical Chemistry Laboratory Concept Test (PCLCT), Attitudes towards Chemistry Laboratory (ATCL) questionnaire and Science Process Skills Test (SPST) as pre and post-tests. In addition, the effectiveness of the PBL approach was also determined through four different scales; Scales Specific to Students' Views of PBL. A statistically significant difference between the students' academic achievement and scientific process skills was found. No statistically significant difference was found at the students' attitude towards the physical chemistry laboratory. The results suggests that the PBL approach promoted critical thinking and problem-solving skills; active participation in the learning process including self-direction, identification of own learning needs, teamwork, creative discussion and learning from peers; and the integration and synthesis of a variety of knowledge and thereby enhanced the academic achievement of students.

According to Scheuer and others (2010) argumentation is an important skill to learn. It is valuable not only in many professional contexts, such as the law, Science, politics, and business, but also in everyday life. However, not many people are good arguers. In response to this, researchers and practitioners over the past 15-20 years have developed software tools both to support and teach argumentation. Some of these tools are used in individual fashion, to present students with the "rules" of argumentation in a particular domain and give them an opportunity to practice, while other tools are used in collaborative fashion, to facilitate communication and argumentation between multiple, and perhaps distant, participants. Students good at argumentation skills seem to understand the concepts better and thus become more knowledgeable and more academically successful.

Evaluation

One of the most essential goals of Science education is to develop students' scientific thinking skills. Piaget, Ausebel and Wallot who are important researchers pointed out that students must be active participant in order to acquire those skills in learning process. In this system, students' learning which is targeted knowledge and skills is more depended on the abilities and learning skills if the students. The performance in Science subjects mainly depends on important constraints, like, considering students as the center of learning, covering real life experiences, applying cooperative studies, using skills such as problem solving, developing communication skills, and promoting logical thinking. On evaluation of the literature related to Science learning skills and academic achievement of students in Science it is very obvious that there is dearth of studies, especially in our country and definitely it requires further investigation.

3.2 Studies Related To Socio-Economic Status and Academic Achievement In Science

Frederickson and Petrides (2008) examined gender, socio-economic and ethnic group differences in academic performance (measured at 14 and 16 years) in a sample of 517 British pupils (mean age=16.5 years). White pupils outperformed their Black and Pakistani counterparts and high socio-economic status pupils consistently outperformed their low socio-economic status counterparts.

Xia (2010) conducted a study to assess the academic achievement of 15-year-old students in reading, Mathematics, and Science literacy to compare U.S. students with their peers in 20 other countries and economies in terms of family factors and academic achievement. Specifically, hierarchical models are estimated to account for the nested structure of the ECLS-K data, and interaction models are used to examine whether and how the relationships between family process factors and student outcomes differ by race and socio-economic status (SES). Using PISA 2006, hierarchical linear models with country fixed effects are estimated in the international comparative analysis of academic effects of family factors. Findings of this study suggest that family process factors can have significant impacts on both academic and nonacademic outcomes. Results of the U.S. data indicated that even after controlling for demographics and school inputs, student achievement was associated with multiple dimensions of family process factors including parental expectations and beliefs, learning structure, resources availability, home affective environment, parenting and disciplinary practices, and parental involvement. Furthermore, several family process variables (including doing homework more frequently, having home Internet access, and owning a community library card) had higher returns in terms of student achievement for black children or children from low socio-economic families than for their counterparts. Family process factors as a whole hold some value in explaining nonacademic outcomes. Results of the international comparative analysis suggest that U.S.

students did not fare as well as their peers in other countries and economies, and those family process variables, especially considered collectively, were important factors in explaining student achievement in an international setting.
In the study conducted by Deepa (2007) on a sample of 317 secondary and 306 higher secondary level students in different categories of schools, found socio-economic status to be significantly correlated to academic performance. It was also noticed that there was no significant difference among students at the secondary and higher secondary levels pertaining to neither socio-economic status nor academic achievement. When the students were investigated based on the categories of schools they were studying it was found that the students in central board schools, were better in their socio-economic status and thus also performed significantly better. Corroborative studies were conducted by Anandhi (2007).

Evaluation

This review's overall finding, therefore, suggests that parents' location in the socio-economic structure has a strong impact on students' academic achievement on the whole and Science In particular. Family socio-economic status sets the stage for students' academic performance both by directly providing resources at home and by indirectly providing the social capital that is necessary to succeed in school (Coleman, 1988). Family socio-economic status also helps to determine the kind of school and classroom environment to which the student has access (Reynolds and Walberg, 1992a). Past research that compared low-socio-economic status schools with higher- socio-economic status schools found several important differences in terms of instructional arrangements, materials, teacher experience, and teacher-student ratio (Wenglinsky, 1998). Finally, in addition to the quality of instruction, family socio-economic status also influences the quality of the relationship between school personnel and parents (Watkins, 1997). The overall finding, therefore, not only reflects the effect of resources at home but also may reflect the effect of social capital on academic achievement.

There are many relationships that can be found between socio-economic status and academic achievements in students (Woolfolk, Winne, and Perry, 2000). There has been much research evidence found to show that high- socio-economic status students of all ethnic groups display higher average levels of achievement and stay in school longer than low socio-economic status students. (White, 1982; Alwin and Thornton, 1984). Other research studies have found that when socio-economic status is measured solely in terms of parents-education, income, or occupation, the relationship between socio-economic status and achievement is stronger than when it is measured in terms of family atmosphere variables such as parents' attitudes toward education, their aspirations for their children, or the intellectual activities of the family (Woolfolk, Winne, and Perry, 2000). Beyond the main findings, the results from this review also showed that the magnitude of the relationship between socio-economic status and academic achievement is contingent upon several factors. More specifically, methodological characteristics, such as the type of socio-economic status measure, and student characteristics, such as students' grade, minority status, and school location, moderated the magnitude of the relationship between socio-economic status and academic achievement.

The nature of the relationship between socioeconomic status and student achievement has been debated for decades, with the most influential arguments appearing in *Equality of Educational Opportunity* (Coleman and others, 1968) and *Inequality* (Jencks and others, 1972) in the United States of America, and a number of commissioned inquiries in Australia (Karmel, 1973). In India too, how socio-economic status influences student achievement is not clear, and there have been many theories to explain the relationship. In one scenario, school students from low socio-economic status homes are at a disadvantage in schools because they lack an academic home environment, which influences their academic success at school. Another scenario argues that school and neighbourhood environments influence academic success, so that low socio-economic status schools are generally lower-performing, and that only extremely resilient young people can escape the 'fate' of low academic achievement. How governments interpret the socio-economic status-achievement debate, influences education policies designed to ameliorate educational disadvantage, so it is important to examine the contribution of socio-economic status makes to achievement at both student and school level. Thus, influence of the variable, socio-economic status on academic achievement of students especially in Science requires a much deeper investigation and so included in the present study.

4. Statement of the Problem

The review done from the available relevant literature, relating to the present research area, led the investigators to conceptualize the problem in an attempt to fill in the lacunae found.
Thus the problem is stated as here under:

Science Learning Skills, Socio-economic Status and Academic Achievement in Science among Students at the Secondary Level

5. Objectives of the Study

- To study the nature of Science Learning Skills, Socio-economic Status and Academic Achievement in Science among Students at the Secondary Level ; and
- To compare students on the select variables of study using classifications of systems of education and gender.

6. Hypotheses

I. There will be a significant and positive relationship among Science learning skills, socio-economic status and academic achievement in Science among students at the secondary level in different systems of education, state, matriculation and central board schools.
II. There will be no significant difference in Science learning skills, socio-economic status and academic achievement in Science among boys and girls at the secondary level in different systems of education, namely, state, matriculation and central board schools.
III There will be no significant difference in Science learning skills of students, socio-economic status and academic achievement in Science among boys at the secondary level in different systems of education, namely, state, matriculation and central board schools.
IV There will be no significant difference in Science learning skills of students, socio-economic status and academic achievement in Science among girls at the secondary level in different systems of education, namely, state, matriculation and central board schools

7. Method of Investigation

The study involved multiple variables necessitating multiple permutations and combinations. The investigator took utmost care to establish a sound research methodology, designing the psychometric properties and executing the same to the sample. The present section has provided a detailed description of the variables studied and controlled, the sample selected, tools constructed and chosen and description of the main study with the briefing of the analyses proposed.

7.1Population and Sample Characteristics

The target population for the present study will be the students at the secondary level. From the target population a sample of 618 students were chosen from the secondary level. The chosen sample comprised of 320 boys and 298 girls from secondary level, Further the sample comprised of 205 students in state board, 211 in matriculation and 202 from central board schools.

7.2 Tools used for the Study

The research tools used for the present study to analyze the job satisfaction, commitment and performance of teachers at the secondary and higher secondary levels are as follows:
The tools selected to be used for assessment of the variables are as follow:

- Academic Achievement in Science
- Vasanthi's Adaptation of Kuppuswamy's Socio-economic Status Scale (Vasanthi, 1991)

The tools chosen were found to be suitable, workable, reliable and valid.

8. Analyses of Data

The results of the analyses of data collected are compiled and presented in tables below:

Table-1a: Simple Correlation Matrix between the Select Independent Variables and Academic Achievement in Science among Boys in State Board Schools at the Secondary Level (N=104)

Variables	Science Learning Skills	Socio-economic Status	Academic Achievement in Science
Science Learning Skills	1	0.20**	0.52*
Socio-economic Status	x	1	0.34**
Academic Achievement in Science	x	x	1

****Significant at 0.01 level** ***Significant at 0.05 level**

In the above table (Table-1a), it is seen that there is significant correlation between all select variables, namely, independent variables, Science learning skills, socio-economic status and the dependent variable, academic achievement in Science among boys students in state board schools

Table-1b: Simple Correlation Matrix between the Select Independent Variables and Academic Achievement in Science among Girls in State Board Schools at the Secondary Level (N=101)

Variables	Science Learning Skills	Socio-economic Status	Academic Achievement in Science
Science Learning Skills	1	0.12	0.31**
Socio-economic Status	x	1	0.57**
Academic Achievement in Science	x	x	1

****Significant at 0.01 level**

It is interesting to note that the academic achievement in Science of girls in state board schools at the secondary level correlates significantly with all independent variables, namely, Science learning skills and socio-economic status.

Table-2a Simple Correlation Matrix between the Select Independent Variables and Academic Achievement in Science among Boys in Matriculation Board Schools at the Secondary Level (N=110)

Variables	Science Learning Skills	Socio-economic Status	Academic Achievement in Science
Science Learning Skills	1	0.02	0.42**
Socio-economic Status	x	1	0.24*
Academic Achievement in Science	x	x	1

****Significant at 0.01 level** ***** Significant at 0.05 level**

The table above (Table-2a) has evidenced a picture of the contribution of the independent variables to academic achievement in Science manifesting a clear relationship. It could be observed that the variables Science learning skills and socio-economic status correlates significantly with the dependent variable, academic performance in Science among boys in matriculation board schools.

Table-2b: Simple Correlation Matrix between the Select Independent Variables and Performance of Female Teachers in Government-aided Schools (N= 122)

Variables	Science Learning Skills	Socio-economic Status	Academic Achievement in Science
Science Learning Skills	1	0.18	0.47**
Socio-economic Status	x	1	0.29**
Academic Achievement in Science	x	x	1

****Significant at 0.01 level**

The table above has indicated a significant relation between the independent variables of Science learning skills, socio-economic status and academic achievement in Science of girls in matriculation board schools.

Table-3a: Simple Correlation Matrix between the Select Independent Variables and Academic Achievement in Science among Boys in Central Board Schools at the Secondary Level (N=106)

Variables	Science Learning Skills	Socio-economic Status	Academic Achievement in Science
Science Learning Skills	1	0.13	0.21*
Socio-economic Status	X	1	0.38**
Academic Achievement in Science	X	x	1

****significant at 0.01 level**

By enlarge the table shows that all independent variables, Science learning skills and socio-economic status are significantly and positively correlated with the dependent variable, academic achievement in Science of boys in central board schools at the secondary level. Usually, boys from central board schools hail from a high socio-economic status, with good home facilities and well educated parents holding good positions in various fields. Since the home conditions and socio-economic status of these boys seems to influence their academic achievement in Science but does not correlate significantly with other independent variables

Table-3b: Simple Correlation Matrix between the Select Independent Variables and Academic Achievement in Science among Girls in Central Board Schools at the Secondary Level (N=96)

Variables	Science Learning Skills	Socio-economic Status	Academic Achievement in Science
Science Learning Skills	1	0.36**	0.36**
Socio-economic Status	x	1	0.50**
Academic Achievement in Science	x	x	1

****Significant at 0.01 level**

The above table of simple correlation matrix (Table-3b) has indicated that all the independent variables, Science learning skills and socio-economic status have a significant correlation with the academic achievement in Science among girls in central board schools at the secondary level.

Table-4a: Summary of Significance of Mean Difference between Boys and Girls in State Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	Boys	104	65.80	2.57	0.25	0.49	17.82	0.001
	Girls	101	74.65	4.31	0.43			
Socio-economic Status	Boys	104	1.69	0.49	0.05	0.07	4.77	0.001
	Girls	101	2.03	0.53	0.05			
Academic Achievement in Science	Boys	104	53.81	10.09	0.99	1.38	10.32	0.001
	Girls	101	68.08	9.72	0.97			

In the above table (Table-4a), it is seen that girls in state board schools are significantly better in their Science learning skills, socio-economic status and academic achievement in Science. The girls as expected are significantly better pertaining to all independent variables and thereby the performance in Science also when compared to the boys in the same schools.

Table-4b: Summary of Significance of Mean Difference between Boys and Girls in Matriculation Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	Boys	110	86.68	3.49	0.33	7.42	10.61	0.001
	Girls	101	94.10	6.37	0.63			
Socio-economic Status	Boys	110	1.92	0.68	0.06	0.34	3.72	0.001
	Girls	101	2.26	0.66	0.07			
Academic Achievement in Science	Boys	110	83.42	4.44	0.42	1.64	2.25	0.05
	Girls	101	85.06	6.11	0.61			

In the above table it is seen that girls in matriculation schools are significantly better in Science learning skills, socio-economic status and academic achievement in Science. The girls as expected are significantly better pertaining to all independent variables and thereby the performance in Science also when compared to the boys in the same schools

Table-4c: Summary of Significance of Mean Difference between Boys and Girls in Central Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	Boys	106	113.42	5.26	0.51	1.06	10.57	0.001
	Girls	96	124.91	9.40	0.96			
Socio-economic Status	Boys	106	2.46	0.56	0.05	0.07	8.74	0.001
	Girls	96	3.09	0.46	0.05			
Academic Achievement in Science	Boys	106	73.62	5.42	0.53	0.83	6.20	0.001
	Girls	96	78.76	6.27	0.64			

In the above table it is evident that boys and girls in central board schools differ significantly with reference to all the independent variables, Science learning skills and socio-economic status and dependent variable, namely, academic achievement in Science. The girls are found to be significantly better with regard to all select variables when compared to the boys in central board schools at the secondary level.

Table-5: One-way Analysis of Variance for the Three Groups of Boys belonging to State(104), Matriculation (110) and Central (106) Board Schools at the Secondary Level

Variables	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	*F* value	Level of Significance
Science Learning Skills	Between Groups	2	119743.64	59871.82	3865.17	0.001
	Within Groups	317	4910.36	15.49		
	Total	319	124654.00	--		
Socio-economic Status	Between Groups	2	33.08	16.54	48.65	0.001
	Within Groups	317	107.76	0.34		
	Total	319	140.84	--		
Academic Achievement in Science	Between Groups	2	48367.38	24183.69	487.74	0.001
	Within Groups	317	15717.82	49.58		
	Total	319	64085.20			

The table showing the *F* ratios (Table-5) manifest that the boys in different systems of education, namely, state, matriculation and central board schools do differ significantly with regard to the select variables, Science learning skills, socio-economic status and academic achievement in Science The significant differences found could be ascertained by calculating the critical ratios for the significant *F* values.

Table - 5a: Summary of Significance of Mean Difference between Boys in State and Matriculation Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	State Board	104	65.80	2.57	0.25	0.42	50.10	0.001
	Matriculation Board	110	86.68	3.49	0.33			
Socio-economic Status	State Board	104	1.69	0.49	0.05	0.08	2.81	0.01
	Matriculation Board	110	1.92	0.68	0.06			
Academic Achievement in Science	State Board	104	53.81	10.09	0.99	1.06	27.52	0.001
	Matriculation Board	110	83.42	4.44	0.42			

The significant *F* ratios found in variables of Science learning skills, socio-economic status and academic achievement in Science further yielded critical ratio values. It could be observed from the table of critical ratios that the boys of matriculation board schools are significantly better in s Science learning skills, socio-economic status and thus, in their academic performances also when compared to the boys in state board schools.

Table-5b: Summary of Significance of Mean Difference between Boys Matriculation and Central Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	Matriculation Board	110	86.68	3.49	0.33	0.61	44.17	0.001
	Central Board	106	113.42	5.26	0.51			
Socio-economic Status	Matriculation Board	110	1.92	0.68	0.06	0.08	6.42	0.001
	Central Board	106	2.46	0.56	0.05			
Academic Achievement in Science	Matriculation Board	110	83.42	4.44	0.42	0.68	14.55	0.001
	Central Board	106	73.62	5.42	0.53			

The table presented above (Table-5b) has manifested significant differences among boys belonging to matriculation and central board schools on variables, namely, Science learning skills, socio-economic status and academic achievement in Science. Interestingly, though the boys in central board schools are found to be significantly better with regard to all independent variables when compared to the boys in matriculation board schools looking into academic achievement it is found that boys of matriculation board schools are found to be significantly better than their counterparts in central board schools. It is interpreted that the syllabi of matriculation board schools, unlike the syllabi of central board schools, is not very challenging and does not reflect the individuality of students. Most of the matriculation board schools are result oriented, and thereby the students are given adequate coaching and tailor made notes are supplied to ensure cent percent results and good marks.

Table-5c: Summary of Significance of Mean Difference between Boys Matriculation and Central Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	Matriculation Board	110	86.68	3.49	0.33	0.61	44.17	0.001
	Central Board	106	113.42	5.26	0.51			
Socio-economic Status	Matriculation Board	110	1.92	0.68	0.06	0.08	6.42	0.001
	Central Board	106	2.46	0.56	0.05			
Academic Achievement in Science	Matriculation Board	110	83.42	4.44	0.42	0.68	14.55	0.001
	Central Board	106	73.62	5.42	0.53			

The table presented above (Table-5c) has manifested significant differences among boys belonging to matriculation and central board schools on variables, namely, Science learning skills, socio-economic status and academic achievement in Science. Interestingly, though the boys in central board schools are found to be significantly better with regard to all independent variables when compared to the boys in matriculation board schools looking into academic achievement it is found that boys of matriculation board schools are found to be significantly better than their counterparts in central board schools. It is interpreted that the syllabi of matriculation board schools, unlike the syllabi of central board schools, is not very challenging and does not reflect the individuality of students. Most of the matriculation board schools are result oriented, and thereby the students are given adequate coaching and tailor made notes are supplied to ensure cent percent results and good marks.

Table-6: One-way Analysis of Variance for the Three Groups of Girls belonging to State(101), Matriculation (101) and Central (96) Board Schools at the Secondary Level

Variables	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	*F* value	Level of Significance
Science Learning Skills	Between Groups	2	125991.12	62995.56	1299.74	0.001
	Within Groups	295	14298.04	48.47		
	Total	297	140289.16	--		
Socio-economic Status	Between Groups	2	60.33	30.17	97.07	0.001
	Within Groups	295	91.67	0.31		
	Total	297	152.00	--		
Academic Achievement in Science	Between Groups	2	14872.94	7436.47	129.68	0.001
	Within Groups	295	16916.50	57.34		
	Total	297	31789.44	--		

The table above (Table-6) indicating the *F* ratios shows significant differences between the three groups on all the select variables, namely, Science learning skills, socio-economic status and academic achievement in Science.

Table-6a: Summary of Significance of Mean Difference between Girls in State and Matriculation Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	State Board	101	74.65	4.31	0.43	0.77	25.43	0.001
	Matriculation Board	101	94.10	6.37	0.63			
Socio-economic Status	State Board	101	2.03	0.53	0.05	0.08	2.75	0.01
	Matriculation Board	101	2.26	0.66	0.06			
Academic Achievement in Science	State Board	101	68.08	9.72	0.97	1.14	14.86	0.001
	Matriculation Board	101	85.06	6.11	0.61			

The critical ratio values indicate that the girls in matriculation schools have shown differences with their counterparts in state board schools with regard to all select variables. This could be interpreted that the girls in matriculation schools come from an elevated socio-economic status than girls in state board schools. Further, the matriculation schools with much confidence and intelligent students provide better facilities, thereby by fostering a positive attitude toward studies and learning skills among students and all these leading to better academic performance among girls, when compared to their counterparts in state board schools.

Table-6b: Summary of Significance of Mean Difference between Girls in State and Central Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	State Board	101	74.64	4.31	0.43	1.03	48.63	0.001
	Central Board	96	124.91	9.40	0.96			
Socio-economic Status	State Board	101	2.03	0.53	0.05	0.07	15.02	0.001
	Central Board	96	3.08	0.46	0.05			
Academic Achievement in Science	State Board	101	68.08	9.72	0.97	1.17	9.11	0.001
	Central Board	96	78.76	6.27	0.64			

The critical ratios presented in the above table have all been significant at 0.001 levels. This has lead to the inference that in Science learning skills, socio-economic status and academic achievement in Science, the girls of central board schools are notably superior when compared to their counterparts in the state board schools. The central board schools are governed by the Central Government, thereby, providing good infrastructure facilities and employing teachers with high profile, competent to deal with the challenging curriculum. The girls in these central board schools also hail from a superior socio-economic status, with well educated parents and adequate facilities at home when compared to the other girls in state board schools. These factors enable the girls in central board schools to perform significantly better than the girls in state board schools at the secondary level.

Table-6c: Summary of Significance of Mean Difference between Girls in Matriculation and Central Board Schools at the Secondary Level

Variables	Groups	N	Mean	SD	SEM	SED	CR	Level of Significance
Science Learning Skills	Matriculation Board	101	94.10	6.37	0.63	1.14	24.06	0.001
	Central Board	96	124.91	9.40	0.96			
Socio-economic Status	Matriculation Board	101	2.26	0.66	0.07	0.08	10.11	0.001
	Central Board	96	3.09	0.46	0.05			
Academic Achievement in Science	Matriculation Board	101	85.06	6.11	0.61	0.88	7.14	0.001
	Central Board	96	78.76	6.27	0.64			

It is seen from the above table the two sets of girls, from matriculation and central board schools differ significantly in connection with all select variables. In other words, girls belonging to the central board schools have better Science learning skills, also hail from a better socio-economic status compared to girls in matriculation schools. In spite of all these reasons, girls in matriculation board schools are able to perform and achieve academically better in Science than their counterparts in central board schools. These results are similar to that of the performance of boys in matriculation and central board schools.

9. Discussion

Science and technology are major influences in many aspects of our daily lives, at work, at play, and at home. Our dependence on Science and technology demands a high level of scientific literacy for all, be it boys or girls. Science education contributes to the growth and development of all students, as individuals, as responsible and informed members of society, and as productive contributors to our country's economy and future. Quality Science education for all students requires the removal of barriers to achievement and encourages continuing participation in Science. Accordingly, the curriculum in Science should recognise, respect, and respond to the educational needs, experiences, achievements, and perspectives of all students: both female and male; of all races and ethnic groups; and of differing abilities and disabilities.

In line with the research conducted by Maehr and Steinkamp (1983) Science education often undervalues the contribution of girls, provides unfamiliar contexts for their learning, and fails to develop their confidence in pursuing studies in this area. It is important to note that the group 'girls' is not homogeneous. Culture and gender factors are inextricably linked and neither should be considered in isolation. A curriculum which is gender-inclusive acknowledges and includes the educational needs and experiences of girls equally with those of boys, both in its content and in the language, methods, approaches, and practices of teaching.

In the present investigation it is seen that there is a significant difference between boys and girls in all the three categories of schools, namely, state, matriculation and central board schools pertaining to all independent variables and the dependent variable, academic achievement in Science in State board schools. The girls are significantly better than the boys in all the three categories of schools and thereby perform better in Science when compared to the boys in their own category of schools. The results are in line with the early researches conducted by Graham and Ronald (1990), Sally and Carolyn (1994), Thompson (2005).

10. Conclusion

There is a widespread consensus that one of the objectives of education is to enable all students to realize their capabilities and reach their full potentials. Education is the most cogent instrument in the progress of any nation. The scenario of education has many approaches, pure and applied. These approaches by and large have been totally fostering human potential channelized and utilized for growth and development. The quality of education has to be improved and any attempt to improve the quality of education ultimately depends not only on the quality of instructions imparted in the classrooms but also on the Science learning skills and socio-economic status

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