



# “A Comparative Study of Declining Trends of Enrolment in Science Stream in Govt. Senior Secondary Boys and Girls Schools in Delhi State.”

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**Abstract:** Education in its broadest sense is any act or experience that has a formative effect on the mind, character, or physical ability of an individual and in its technical sense education is the process by which society deliberately transmits its accumulated knowledge, values, and skills from one generation to another through institutions. The major purpose of science education is to increase the flow of specialist scientists, technologists and engineers, it could be argued that young people with a special talent in science should be identified as early as possible and provided with a separate, specialised, and highly focused science education and this identification must start right from the senior school level. Despite this identification we are still facing major problems in Science Education at Senior Secondary Level. Today's gender gap in education often focuses on the advantage males have over females in science and math, but fails to recognize the falling behind of males to females in literacy. So in this study we need to look out for the various reasons for such decline and the possible solutions to overcome this gender stereotypes in order to build a meaningful Scientific Society consisting of both female and male scientists as this discrimination on the basis of sexes is the possible hindrance in the National Development. This paper is an attempt to find out the main drawbacks in the learning outcomes among Government School Students which are withholding them to opt Science as their future career option.

**Keywords:** Science Education, Gender Gap, Literacy, Decline, Gender Stereotypes.

## 1. Introduction:

Education, as a planned endeavour, at a personal level on small scale or institutional level on a large scale, aims at making learner capable of becoming active, responsible, productive and caring members of society. Education is supposed to encourage the students to analyse and evaluate their experiences, to doubt, to question, to investigate- in other words to be inquisitive and to think independently. Just as a face is the mirror to the heart of a person, level of education reflects the status of a nation. Education provides them required knowledge, technique, skill and information and enables them to know their rights and duties towards their family, their society and towards their motherland at large. Education expands their vision and outlook, provokes the spirit of healthy competition and a desire to advance for the achievements of their consciousness. Education is commonly divided into stages such as Preschool, Primary School, Secondary and Senior Secondary School and then College, University or Apprenticeship. A right to education has been recognized by some governments. At the global level, Article 13 of the United Nations, 1966 and on National level Article 21-A recognizes the Right to Education (Education for all). Although education is compulsory in most places up to a certain age but attendance at school often isn't and a majority of parents prefer either no-schooling or home schooling for their children.

Science is defined in several ways by different individuals as following:

“Science is a cumulative and endless series of empirical observations which results in the formation of concepts and theories. With both concepts and theories being subject to modifications in the light of further empirical observations. Science is a body of knowledge and the process of acquiring it.” ----- Fitzpatrick

“Science is an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observation and are fruitful of further experimentation and observation.” -----Conant

Science is quite important in our lives because it basically studies the things happening around us and within us from a scientific point of view; it looks for facts to explain things. It has helped us to understand things and that has actually led to the various inventions. It has also revolutionised the field of medical sciences. The major purpose of science education is to increase the flow of specialist scientists, technologists and engineers, it could be argued that young people with a special talent in science should be identified as early as possible and provided with a separate, specialised, and highly focused science education and this identification must start right from the senior school level.

**1.1 Enrolment Decline:** The decrease or decline in the number of students enrolled in a school is known as enrolment decline. Since the turn of the century, there has been a barrage of reports and statistics that point to one fact regarding enrolment decline in various fields of education: there is a sharp decline of enrolment in science education. The statistics differ by area of study, school and gender and sometimes categorize the numbers differently. The enrolment of women in science has experienced a sharper decline than enrolment of men. The number of women in science and engineering fields are constantly increasing, but they are also continuously being outnumbered by men. In elementary and middle school the participation of boys and girls in science stream are roughly equal, yet fewer women pursue this stream in senior secondary level compared to men (Hill et al. 2010). This kind of gender disparity is often referred to as Gender Gap or Gender Inequality/ Sex Differences. Gender inequality refers to unequal treatment or perceptions of individuals based on their gender. It arises from differences in socially constructed gender roles as well as biologically through chromosomes, brain structure, and hormonal differences. Gender systems are often dichotomous and hierarchical; gender binary systems may reflect the inequalities that manifest in numerous dimensions of daily life. Gender inequality stems from distinctions, whether empirically grounded or socially constructed.

**1.2 Gender Gap:** Gender gap refers to unequal treatment or perceptions of individuals based on their gender. It is the differences between women and men, especially as reflected in social, political, intellectual, educational, cultural, or economic attainments. Experts often argue that women’s education is the key to reducing discrimination against girls. However, female literacy rate has risen from 15 to 54%, even as the juvenile sex ratio has fallen. Some studies have shown that educated mothers are far more “efficient” in discriminating against their daughters than uneducated mothers. The female child in India is often deprived from her right of an education. The number of girls dropping out of school far exceeds the boys because girls are expected to help at home, either with household work like washing and cooking or with taking care of younger siblings. Since girls spend more time performing domestic duties and this increases the gap between female and male equality in rural parts of India, it perpetuates the myth that education is of no help to the girl and her primary job will be to look after the household work, get married early, have children and then raise them.

Today’s women are no more a household item but still there are certain stereotypes prevailing in our society that force girls to not go for Science stream at school level. This kind of pattern is prominent in Government schools which is evident from the fact that there is an observed enrolment decline in Science Stream at Senior Secondary Level of Girls School. The gender gap between men and women in support of gender role equality in general can be explained by individual characteristics. It is possible that characteristics of the country where people live influence the support of gender role equality of men and women differently. Gender roles apply to different domains of life and this is also the case with gender role attitudes. Gender role attitudes can be held upon the appropriate roles for men and women in politics, employment, education, family life and reproduction, but also on the consequences of different roles for family life or the nation. In the category ‘childhood’, the work experience of the mother can have a differential effect on male and females. It is argued that exposure to feminist ideas early in life, represented by mothers work experience is especially important for men, since their consciousness has to be raised by exposure by significant others more than for women who are exposed to these ideas when they for example enter the labour force themselves (Bolzendahl & Myers, 2004; Klein, 1984; Reingold & Foust, 1998). On the other hand, women identify more with their mothers than men do, although that idea is not supported by the literature. Working mother interaction hypothesis: the effect of a working mother in the youth is larger for men than for women. Today, boys dominate among high school dropouts, special education students, and literally any

failed or special needs category throughout adolescence. The notorious underperformance of boys in school and their tendency to disrupt the learning process in the classroom has sparked intense academic as well as public debates about the causes of what many now call the “problem with boys.” Some see the gender gap as largely biological in origin. Others blame schools for an allegedly de-masculinised learning environment and an alleged tendency to evaluate boys negatively for fitting into this environment less well than girls. Integrating theories about gender identity, adolescent culture, and the findings from prior ethnographic classroom observations, we argue that the school environment channels the conception of masculinity in the peer culture, and thereby either fosters or inhibits the development of anti-school attitudes and behaviour among boys. An academically oriented environment suppresses a construction of masculinity as oppositional and instead facilitates boys’ commitment by promoting academic competition as an aspect of masculine identity. Lower quality schools, in contrast, implicitly encourage – or at least do not inhibit – the development of a peer culture that constructs resistance to both school and teacher as valued masculine traits. Girls’ peer groups, in contrast, do not vary as strongly with the social environment in the extent to which school engagement is stigmatized as “un-feminine.” As a result, boys benefit particularly from school resources that create a learning oriented peer culture, and the size of the gender gap in educational performance depends on environmental factors connected to the quality of schools.

The research issues raised here are as follows:

- What are the causes of Enrolment Decline in Science Stream at Senior Secondary level in Govt. Schools?
- Whether Gender Gap is the root cause of this Enrolment Decline?
- What are the possible measures that can be taken to remove the problem of Gender Gap in Science Education?

## 2. Review of Literature:

Science and Technology have been central to India’s development efforts since achieving independence. Jawaharlal Nehru, the first Prime Minister, was a firm believer in the crucial importance of science and technology for economic growth and social transformation, and helped lay a firm foundation of science and science education in the country

Enrolment in science stream at senior secondary level has been facing a steady decline for a number of years. Although more recent trend has shown a slight upward trend in enrolment, but the number of admitted students into science stream falls far short of what they have been before demands. It arises from differences in socially constructed gender roles as well as biologically through chromosomes, brain structure, and hormonal differences. Gender systems are often dichotomous and hierarchical; gender binary systems may reflect the inequalities that manifest in numerous dimensions of daily life. Gender inequality stems from distinctions, whether empirically grounded or socially constructed (Azad Ali and Charles Shubra,2010). Some other focuses that there were lacks of qualified science teachers in the sampled secondary schools; 52.25% of the respondents in these schools also indicated that science teachers were not teaching well (Aina, Jacob Kola, Adedo Ganiyu Akanbi , 2013), the lower level of academic support that they receive at home, a little higher level (66.66%) of parental encouragement, girls’ willingness to have separate schools for them and the higher level (86.66%) of sincerity of parents towards their daughter’s education (Jasim Ahmed,2013).

The four common reasons for this enrolment decline: first, the image of technology courses as antisocial, second the cyclic nature of demand on technology professionals, third, the increase in the variety of technology related majors (like IT and MIS) and fourth the notion of outsourcing of technology jobs overseas (Lenox, Woratscheck and Davis,2008)

## 3.Methodology:

### 3.1 Description Of Study:

This study is carried out in order to understand the problem of Enrolment Decline in Science Stream in our Indian Education System and the main factors responsible for it. Our Indian Society is growing in various aspects but still there are certain loopholes or drawbacks which are making us lag behind with respect to other countries. Education plays an important and vital role in shaping an individual and also making the nation progress in various fields but any hindrance to it contributes to its devastation. Being in the race of making India a Developed Nation, we need to have an access and make certain contributions to come in the eyes of other nations and set an example. With the development of Science and Technology and achieved so much of success in this field, there is an urgent need of making or generating new scientists which can also contribute to our nation. For this we need to lay stress on more enrolment in the field of Sciences to encourage the young budding scientist right from the School Level.

This study is based on the following objectives:

1. To study the trend of Enrolment in Science Stream in Govt. Boys Senior Secondary Schools.
2. To study the trend of Enrolment in Science Stream in Govt. Girls Senior Secondary Schools.
3. To compare the rate of Enrolment Decline in Science Stream in Govt. Boys and Girls Senior Secondary Schools.
4. To study the causes of Enrolment Decline in Science Stream at Senior Secondary level in Govt. Schools.
5. To study the relationship between Discrimination against Girls and Enrolment Decline in Govt. Senior Secondary Schools in Science Stream.
6. To find out the possible solutions to reduce discrimination (if any) against the Girls.

### 3.2 Population of the Study:

The population of the study were all students enrolled in Science Stream at Govt. Boys and Girls Senior Secondary Schools in Class XI-XII along with the Principals and Teachers of the same School.

### 3.3 Sample of Study:

The Sample of the study will consist of 3 Govt. Boys Senior Secondary Schools and 3 Govt. Girls Senior Secondary Schools of EAST DELHI. This shall include about 150 Students, 6 Principals and 15 Teachers (PGTs). The sampling method employed in the study is Probability Sampling, in which the sample undertaken was chosen on random basis, i.e., Random Sampling is done during the selection of the sample. The Schools which has been taken in the study are randomly selected among the Govt. Schools of East Delhi in which Science Stream is available so that the data can be collected. The students which have been taken as sample, are from those randomly selected schools. The students which are 150 in number are from the Science Stream and are studying in Classes XI-XII.

### 3.4 Tools Used:

For the Students, a questionnaire was used as a tool which includes both open ended and close ended questions while for the Principals and the Teachers an interview schedule was build up to collect the data.

## 4. Result and Analysis:

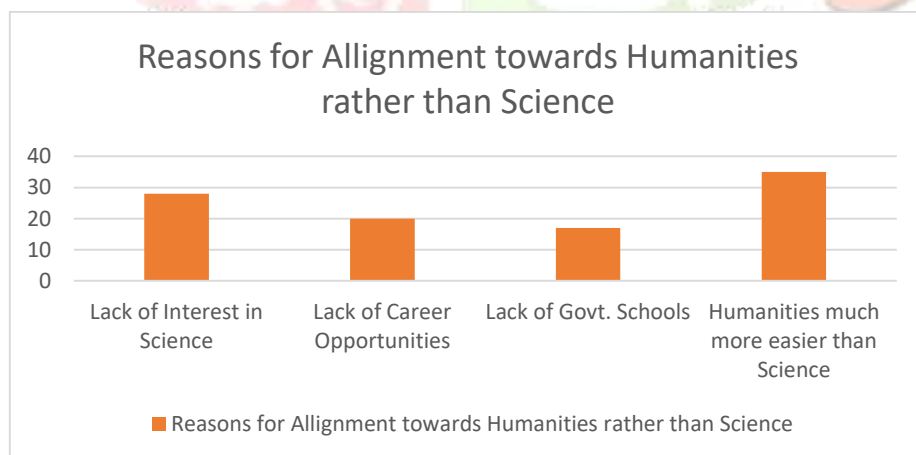


Fig.1: Reasons for alignment towards Humanities

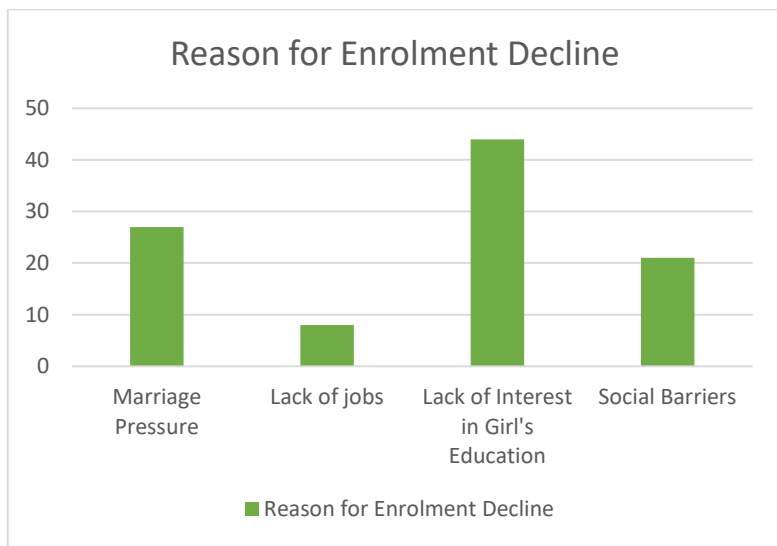


Fig.2: Possible Reasons for Enrolment Decline

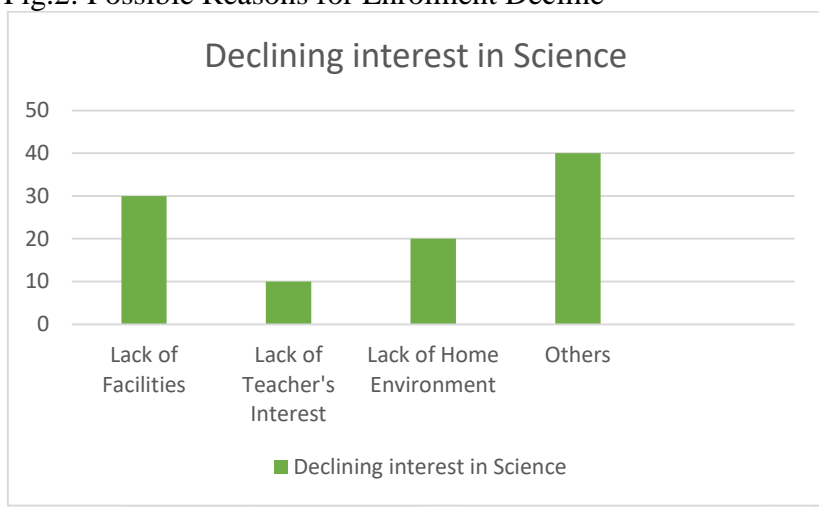


Fig.3: Reasons for declining interest in Science

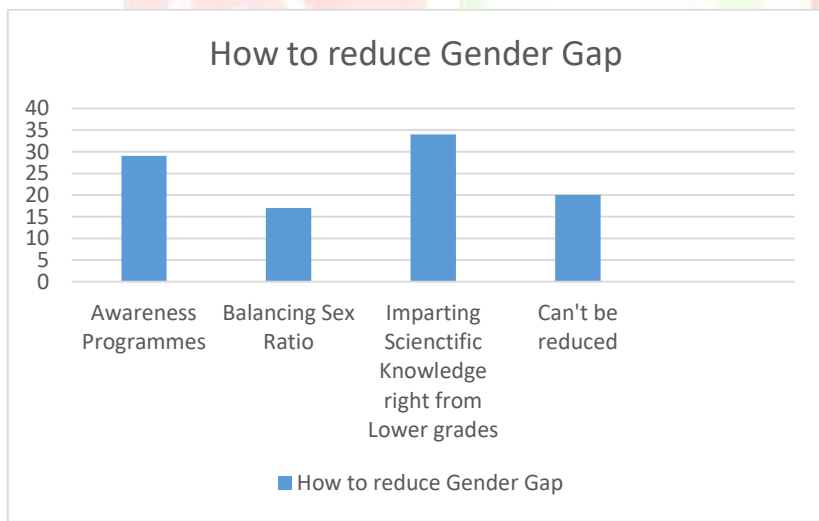


Fig.4: Ways to reduce Gender Gap

As per the data obtained from a group of 150 Senior Secondary Government School Science Stream students, it is evident that there has been a perception that there is less career options for girls in science stream due to which they either go for commerce or humanities group. Parents think girls to be meant for just household work but girls themselves found them more capable in studies than boys due to which there is lack of interest in Girl's Education. Science not only helps them in building scientific attitude and aptitude but also helps in developing scientific temperament and generating scientific knowledge. If proper tools/ teaching aids are being used at an early stage of students, then they may develop interest in science and can go for higher studies even. Science opens a lot of career options for both boys as well as girls like Research, Medicine, Engineering as well as they can go for Teaching. Science has always been a boon to the society and can even help in reducing these gender gap problem

through various Medias like Nukkad Nataks, Radio/ Televisions and other social Medias which sensitize the people and can even make them aware of the importance of Girl Education. This gender inequality needs to be vanish from our society if we want to build a developed nation as it offer a negative impact on the psychology of students.

The views presented by most of the teachers pointed towards this only that the perception has changed. Nearly fifty percent of students may lose interest in science by the third grade, and the number of students preparing for a science-related career is declining. Several factors, including gender, expected achievement and previous science experiences could influence a student's attitude toward science.

Change in Perception of Students	
Type of Responses	% of Responses
Due to gender gap	52
Due to low achievement in science	25
Influence of senior students	21
Has not changed	2

Table 1: Showing the changes in perception of students according to the Teachers and Principals.

A student sees their teachers as their guide, facilitator and as a friend. A teacher needs to provide proper guidance to the students so that they get motivated. Most of the teachers agreed to that there is a need to motivate children in order to make them study. There are various career opportunities that science offers to the students which need to be discussed from time to time in the classroom so as to develop keen interest in taking science as a career option. A teacher through their own experiences may guide a student to pursue science as their career as most of the teachers responded that the students get the right motivation in government schools through a teacher only.

Need to Discuss on Career Prospects in Classroom	
Type of responses	% of Responses
Provides motivation	13
Clarify the misconception	19
Helps to find the right career option	68

Table 2: Need of Discussing Career related Talks in the Classroom.

All the teachers agreed to the Problem of Enrolment decline in Science Stream in their schools. They find more girl enrolment in Commerce and Humanities Stream. Enrolment decline is a major problem in the science stream especially in government schools as generally girls don't want to opt for this stream. Many social barriers and hindrances are present in the mind of the parents as well as students that leads to the problem of enrolment decline. Apart from this lack of facilities, lack of opportunities are also contributing to this enrolment decline. The major responses given by teachers include lack of interest in girl's education by the parents.

## 5. Conclusion:

In this study it was found that there is a problem of gender gap in our society which is often referred to as gender inequality which is increasing at an alarming rate. This problem is often felt with the girls. The main reason behind this problem is that parents often lay less stress on Girl's Education and often consider them best suited for home and generally don't promote their education due to which there is an overall decline in Girls enrolment at senior secondary level. Apart from this, if parents agrees to girl education then they don't motivate the child to pursue career in Science due to which each year more boy's students are getting enrolled as compared to girls which increases this enrolment decline in science stream. The root cause of this decline lies in the primary education as the students don't get that much exposure as they require in their early student life due to which they lose interest and find commerce and humanities as more easy go through subjects. So the various methods that came out through this studies lays stress on the fact that awareness needs to be prevailed in the society so that more and more parents send their child to the school especially girl child and motivate them to pursue their career in science as they are far much capable than boys in various fields which we generally see in our society in the urban areas especially.

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