



# GENDER FOOTPRINT ON QUANTITATIVE RESULTS

Dr. Amit Nandu

Associate Professor, Dept. of Accountancy

H.R. College of Commerce & Economics

## ABSTRACT

Boy or Girl? India has been facing this question since centuries and each individual has their own reasons. We have typecast men & women, boys & girls in different brackets. For us, both are better than the other in certain fields. What about academics? There is a general perception that girls do better than boys in studies. Is this true? Let us find out.

Most of the times the reason students don't perform well in exams is because they don't have proper basic understanding of the subject which begins at the primary level. But we Indians attribute it to their gender. Hence this paper focuses on finding out is there any direct correlation between a student's performance in higher education with his/her gender?

For this purpose, Mathematics was taken as the base subject because that is one subject which a student has to study right from primary education till higher education. So the researcher has tried to find out how boys & girls have performed in Mathematics in class XII. Is there any correlation between the gender of the student and the performance?

### Key Words:

Gender: Gender of students appearing for HSC examination (male/female)

Footprint: Impact/Effect.

Quantitative Results: Marks scored in Mathematics paper in HSC examination..

## INTRODUCTION

### **Overview of Education System in India**

"Education is the most powerful weapon which you can use to change the world."

Nelson Mandela.

### Quality Concern in Education

Locating the term quality in educational discourse is now a universal concern today. "Quality is somewhat problematic: like beauty, it lies in the eyes – or rather the mind of the beholder" (Cliff. et al. (1987). Quality has been extensively defined by Dewney et al. (1994) as, "meeting, exceeding and delighting customer's needs and expectations with the recognition that these needs and desires will change over time." Its practice in the sphere of education demands that the education available to all children in different regions and sections of society has a comparable quality. J. P. Naik describes equality, quality and quantity as the elusive triangle of Indian education. Dealing with this metaphorical triangle requires a deeper theoretical understanding of quality in education than has been what available in schools today. United Nations educational, Scientific and Cultural Organization's (UNESCO) recently published global monitoring report which discusses systematic standards as the appropriate context of the quality debate (see Global Monitoring Report 2006 – Literacy for Life, UNESCO, 2006). From this point of view, the child's performance needs to be treated as an indicator of systematic quality. With reference to education, quality is a relative term and hard to define and even more difficult to measure.

### School Education System under Different Boards

In the minds of many people, school boards have considerable influence over educational decisions and provide a key social and political connection to the schooling process. In India, though there is the provision of central authority, but primary education is a state system and power officially resides with the states. A school board functions locally, within the confines of the state's delegation of power and the geographical boundaries of the district, but is a legal agency of the state and thus derives its power from the state's constitution, laws, and judicial decisions. By state legislative enactment, school boards delegate power and authority to develop policies, rules, and regulations to control the operation of the schools, including system organization, school site location, school finance, equipment purchase, staffing, attendance, curriculum, co-curricular activities, and other functions essential to the day-to-day operation of schools within the district's boundaries.

### School Boards in India

There are 33 different educational boards in the country, including the Central Board of Secondary Education (CBSE), Council for the Indian School Certificate Examinations (CISCE) which is the umbrella for ICSE and ISC and the various State Educational Boards.

However, our major focus in this study is on the Central Board of Secondary Education (CBSE), Indian Council of Secondary Education (ICSE), International Baccalaureate Organizations (IBOs), The International General Certificate of Secondary Education (IGCSE) and Secondary School Certificate (SSC).

## Project objective and Research Question:

### Objectives

To determine whether gender plays any role in the performance of the students

### Research Question:

Is the popular notion of girls getting better marks than boys true?

## Project Scope and Limitations

### Project Scope

The scope of the project includes preparation of questionnaire, data collection and analysis of data collected, review of existing literature, findings and recommendations. The field work involves visiting a few students' houses and interviewing their parents.

### Limitations of the study

**Sample Distribution:** Though the sample size was large, I wasn't able to obtain sufficient students from IB and IGCSE board. As a result, the study focuses more on three boards viz. SSC, CBSE and ICSE.

**Access:** Due to unavailability of sufficient funds, I had to use Microsoft Excel for statistical analysis which is not as comprehensive as SPSS.

**Time Factor:** Due to paucity of time, I could not visit each respondent's house and take the interviews.

### Project Benefits

**Relevance to Society:** This is a pioneering study in the field. It will analyze the performance of those children in higher education i.e. Class XII to judge the impact of gender on the performance in Mathematics in Class XII. This research project will be extremely helpful to all parents who are right now confused about the gender affecting their child's performance.

## RESEARCH METHODOLOGY

### Study Design

This research is primarily about students who had opted for Mathematics as a subject in class XII. This research is to try and find out whether the students performance in Mathematics in Class XII is influenced by the gender. Hence I have used the method of primary data collection via questionnaires to obtain information about the marks. The data so collected was then analyzed using various statistical techniques and conclusions were drawn from the results.

## Study Setting

Students from H. R. College of Commerce and Economics who had opted for Mathematics in class XII and who have passed class XII were included in the primary study. The reason for selecting students only from one institution was to eliminate external influencing factors like teachers quality which could impact their performance in class XII. Since they are from the same college, it would mean they have studied Mathematics in class XII from the same teachers, which in turn would mean that that is a constant factor.

## Sampling

The sample was selected through a method of Systematic Sampling. 30 questionnaires were distributed to each of the 8 divisions of F.Y.B.Com. Out of 240 forms so distributed, 193 students submitted the forms, out of which 26 forms were rejected because of incomplete information. Hence, the final sample size for the study was 157 students. Also, since the sample was chosen from a single college, almost all had the same socio-economic status and hence had the same exposure to information.

## Variables

For the purpose of statistical analysis, following variables were taken into consideration. No control variables were taken in the study.

### Dependent Variable:

Marks: This is the marks obtained in the subject at the yearend examination, a quantitative variable.

### Independent Variables:

Gender: This is a qualitative variable, to know if the student was a boy or a girl. It is a dummy variable.

## Study Methods

Questionnaire: A short, simple and objective type of questionnaire was prepared and distributed among the classes of F.Y.B.Com of H. R. College of Commerce and Economics. It contained various questions in order to provide the necessary data to carry out this survey.

## Data Collection

Data was collected from a sample of 157 students which included 59 boys and 98 girls through the questionnaires.

## RESULTS

### Representation of data collected

Once the data is collected, it is easier to draw patterns in the data via representation through diagrams. Based on my data, I have represented them through pie diagrams and bar diagrams wherever applicable. Further conclusions are drawn once the data is analyzed.

Data was collected from 157 students of first year B.Com which included 59 boys and 98 girls. The following diagram represents this distribution:

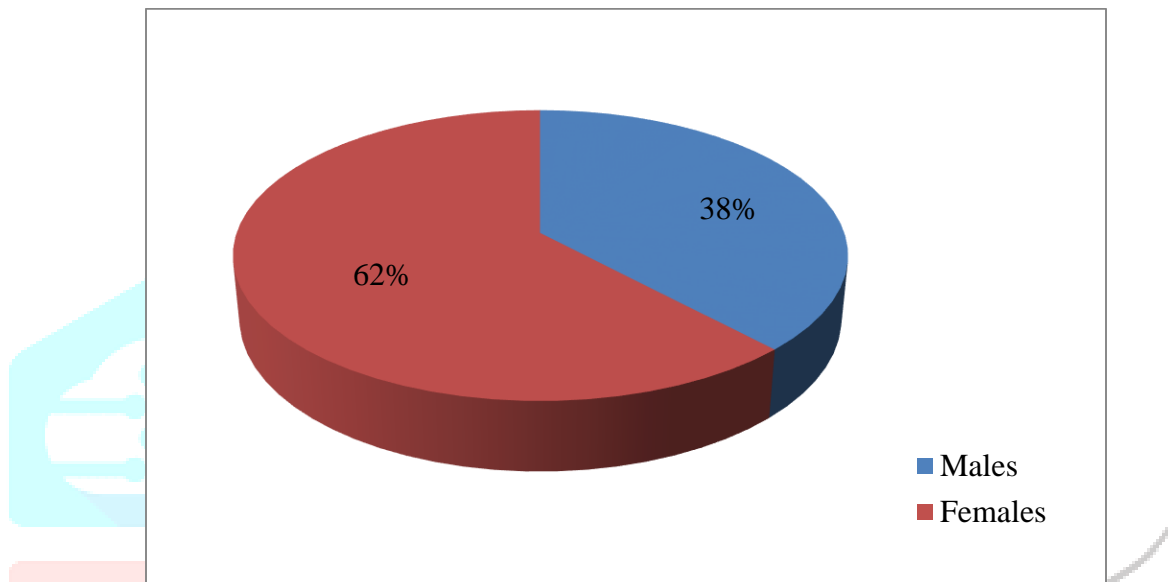


Figure 1: Distribution of boys and girls in the data collected

Four boards emerged from the data collected. These were

- SSC
- ICSE
- CBSE
- IGCSE

The questionnaire also included the IB board. However, there were no students from that board in the data collected. Hence they are not represented in the results.

It is seen that maximum students are from SSC board: 103 students, followed by ICSE: 47 students. CBSE and IGCSE had 5 and 2 respondents respectively.

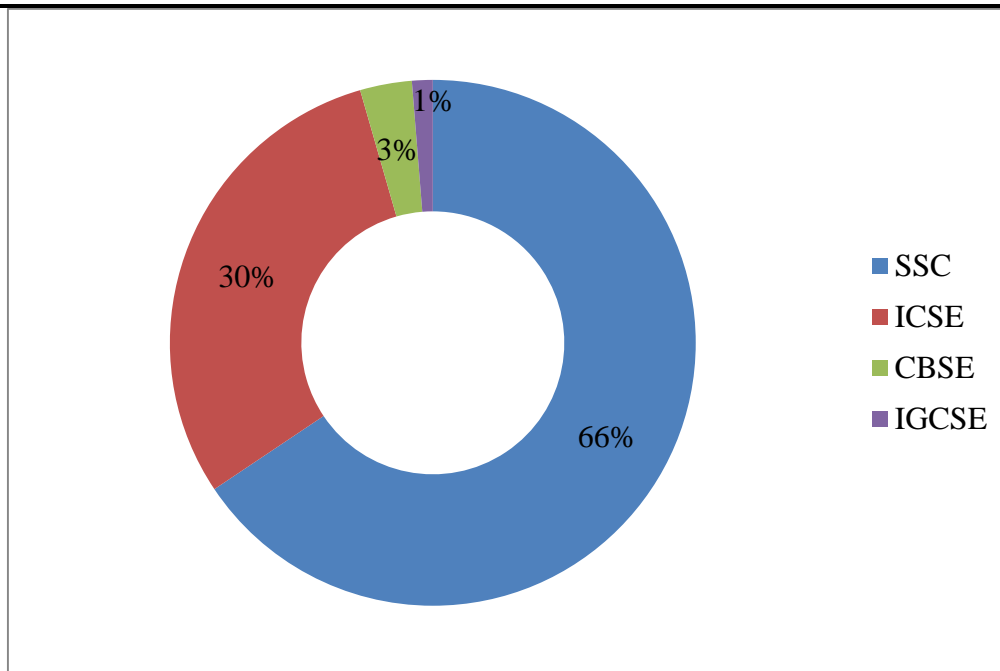


Figure 2: Distribution of students in different boards

In order to determine the correlation between students who have scored high marks in Class X and the marks obtained by them in Mathematics in Class XII, the students were asked their percentages in the class X examination. It was seen that maximum students fall in the range 90% - 95%.

The percentage of students who scored higher than 95% and lower than 90% were 11% and 20% respectively. This is represented in figure 3.

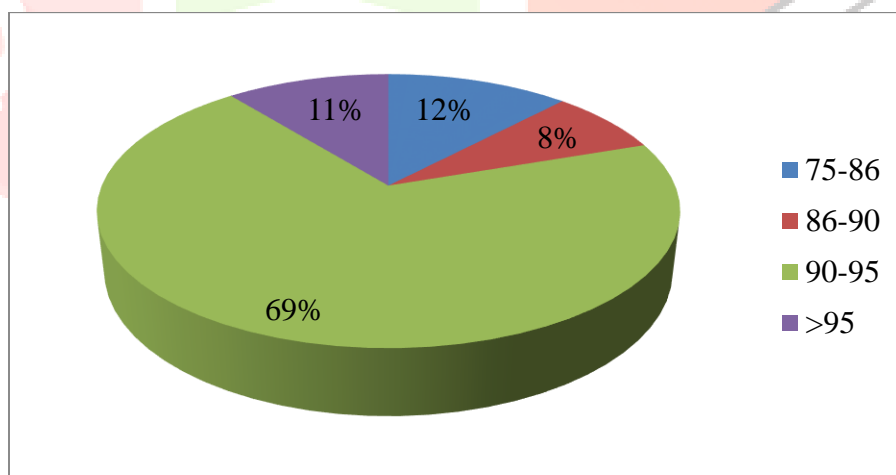


Figure 3: Distribution of marks scored in Class X examination

The following figure gives the distribution of marks of students in Mathematics in Class XII. It is seen that maximum students have scored more than 90% marks.

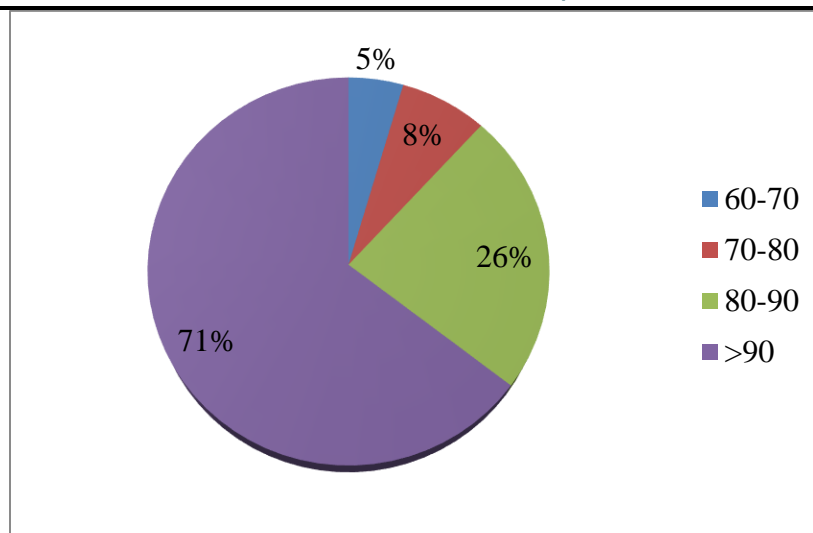


Figure 4: Distribution of marks scored by students in Mathematics in Class XII

As the objective of the paper is to determine whether boards impact the marks obtained in Mathematics in Class XII, averages marks were calculated for the different boards. Figure 5 shows the average marks obtained in the same. It is seen that average of CBSE is the highest, followed by ICSE & SSC.

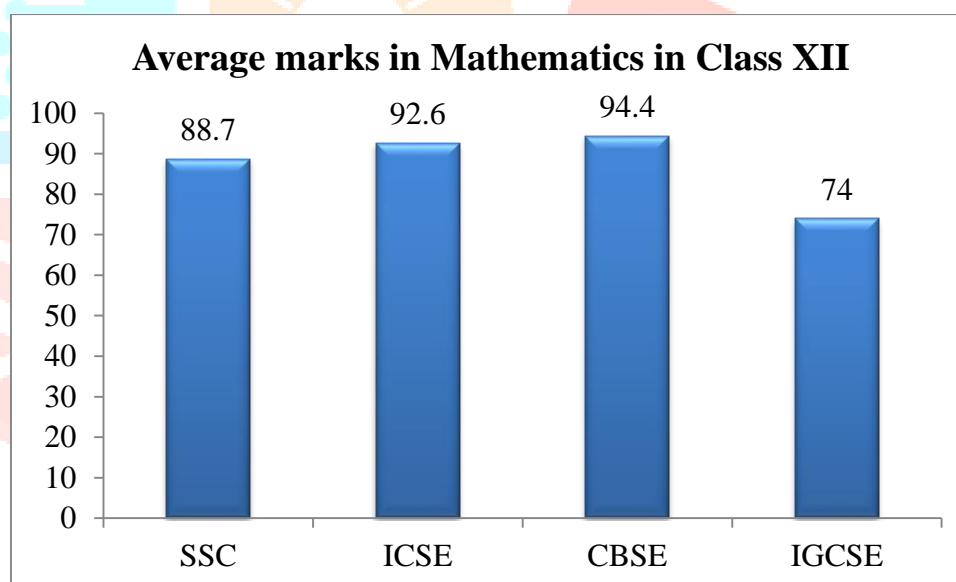


Figure 5: Average marks in Mathematics in class XII

### Hypothesis.

At H. R. College, it is seen that the toppers are usually girls. So I wanted to determine if marks secured by students are influenced by their gender.

$H_0$  : Marks do not depend on gender i.e. there is no difference between the marks of boys and girls.

$H_1$  : Girls score more marks than boys

Since the sample size was fairly large, a Z-test was performed for two samples. The formula is given as :

$$Z = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

Here

$\bar{x}_1$  : arithmetic mean of marks of boys for sample

$\bar{x}_2$  : arithmetic mean of marks of girls for sample

$\mu_1$  : arithmetic mean of marks of boys for population

$\mu_2$  : arithmetic mean of marks of girls for population

$n_1$  : sample size of boys

$n_2$  : sample size of girls

$\sigma_1$  : standard deviation of marks of boys for sample

$\sigma_2$  : standard deviation of marks of girls for sample

Here the quantity  $\mu_1 - \mu_2$  is zero as we assume that there is no difference between the marks of boys and girls.

The Z test was performed using Microsoft Excel and the following output was obtained:

z-Test: Two Sample  
for Means

	Variable 1	Variable 2
Mean	90.48135593	91.38265306
Known Variance	17.7922326	13.8000053
Observations	59	98
Hypothesized Mean Difference	0	
z	-1.355097112	
P(Z<=z) one-tail	0.087693309	
z Critical one-tail	1.644853627	
P(Z<=z) two-tail	0.175386619	
z Critical two-tail	1.959963985	

Figure 4.12 Output of z-test

Since the alternate hypothesis is one sided, the value of the test statistic obtained is -1.355097112 whereas the critical value is 1.644853627. As the test statistic is less than the critical value we DO NOT REJECT the null hypothesis. i.e. marks are independent of gender.



## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions:**

At H. R. College, it was seen that the toppers are usually girls. So I wanted to determine if marks secured by students are influenced by their gender. Since the sample size was fairly large, a Z-test was performed. **It was concluded that marks are independent of gender**

### **Recommendations:**

Based on my study, I would like to recommend the following:

The Central government and the Education Ministry should advertise the fact that gender has no role to play in a student's performance. The benefits of this will be far reaching. It will remove the confusion amongst parents; all students will have the same knowledge base, going for higher education.

### **Future Scope:**

Further research can be carried out regarding other subjects. One can find out which board syllabus is the best for which subject. This will help in framing of a common syllabus.

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