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Exploring Gender Differences in Scientific Aptitude Among Secondary School Students: A Comparative Analysis between Boys and Girls

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Abstract:
Present study explores the Numerical ability and Science information (Scientific aptitude) among boys' and girls' students. It is aimed to find out the difference between boys' and girls' students in terms of Numerical ability and Science information. A sample of 100 (50 each from boys and girls) students has been taken from government secondary schools of Goalpara district, Assam. For the selection of sample schools, Researcher used random sampling technique. The data were collected with the help of standardized tool. For the research work, researcher used Scientific Aptitude Test Battery (SATB) developed by Agarwal, K.K and Aurora, S. In this study descriptive research design is used. The study employed quantitative method and include standardized tests. The major findings of the study revealed that the Boys possess more Numerical ability than Girls. Again, there is no informational difference between boys and girls in the field of science.

Keywords: Numerical ability, Science information, scientific Aptitude, government school.

Introduction:

The adolescent years reflect a vital time of cognitive and academic development, characterized by a fast growth of intellectual capacities and academic activities. Amidst this key period, the concept of scientific aptitude emerges as a fundamental variable defining scholastic achievement, notably in the domains of science, technology, engineering, and mathematics (STEM). Clarifying the routes to academic success and vocational preparedness in the contemporary era requires an understanding of the relationship between adolescent scientific aptitude and academic achievement.

Scientific aptitude is a broad term that includes a variety of cognitive functions, problem-solving techniques that support understanding and competence in scientific fields. The term "scientific aptitude" describes a person's innate ability to understand, evaluate, and interact with scientific ideas, procedures, and problems. It can also refer to a person's natural or acquired capacity to do a task in the scientific domain.

Finding out how boys and girls in the Goalpara district fare in terms of scientific aptitude is the aim of the current study. basically, Numerical ability (Scientific Aptitude) and Science information (Scientific Aptitude) among the Adolescent boys and girls. Scientific aptitude has been the subject of several research. In 2023, Prof. Jaskiran Kaur , Dr. Anuradha Sekhri and five other researcher did research on Comparative Analysis of Gender Differences in Scientific Aptitude. In the result girls excelled over the

boys in all the three variables of scientific aptitude i.e. in Numerical Ability, Scientific Vocabulary and Total Aptitude Score. The differences between the boys and the girls were not found significant in Reasoning and Scientific information but the differences were significant in Numerical ability and Scientific vocabulary.

Another study conducted by Shabir Ahmad Dar & Ishfaq Majid (2022) on scientific aptitude of economically disadvantaged secondary school students. They conducted this study in Anantnag district of Jammu & Kashmir. The findings showed that the boys' students having differential levels of scientific aptitude do not differ in their achievement in science. Again, in case of girls' students having different levels of scientific aptitude differ in their achievement in science. And lastly this research reveals that the scientific aptitude of girls was higher than the scientific aptitude of boys.

Numerous investigations were therefore carried out at the secondary school level. Investigating the several factors that influence scientific aptitude at the secondary and higher secondary levels is therefore crucial.

Statement of the problem:

"Exploring Gender Differences in Scientific Aptitude Among Secondary School Students: A Comparative Analysis between Boys and Girls"

Objectives of the study:

There are following objective of the present study

1. To find out the difference between boys and girls students in terms of Numerical ability.
2. To find out the difference between boys and girls students in terms of Science information.

Hypothesis of the study:

Following null hypotheses are formulated for the present study

1. There would be no significant difference between boys and girl's students in terms of Numerical ability.
2. There would be no significant difference between boys and girl's students in terms of science information.

Operational terms used:

1. **Scientific Aptitude:** It is a reference to the class X science student's SATB manual score.
2. **Secondary Students:** Students belonging to Secondary level of Goalapra district of Assam.

Delimitation of the Study:

Limitations of the present study were as follows:

1. Present study is limited to the Class X students of Goalpara district of Assam.
2. Present study is limited up to Assamese medium schools under SEBA only.

Research Methodology:

The present study is Descriptive research. Descriptive research is also known as non- experimental research or co-relational research. The researcher used the survey approach in this investigation. In this case, the investigator employed both primary and secondary data. Secondary data are gathered from

numerous books, journals, the internet, etc., while primary data are primarily gathered from secondary school students using questionnaires.

Sample:

The researcher had decided to study the Scientific Aptitude i.e. Numerical ability and Science information of Secondary schools students. Therefore, Students of class X, studying in Assamese medium Secondary Schools of Goalpara were considered in the population of the present study. The researcher selected 100 class X students as a sample of the study. Out of those 100 class X secondary school students, 50 were boys and 50 were girls. In this context, the investigator followed the random sampling technique.

Tools:

1. Scientific Aptitude Test Battery (SATB) developed by Agarwal K.K and Aurora, S.

Data Analysis and Interpretation:

Significance of the difference (t-test) has been used in the present study for statistical analysis of the data.

Hypothesis – 1

There would be no significant difference between boys and girl's students in terms of Numerical ability.

Table No. 1: Showing the Difference between boy's and girl's students in terms of Numerical ability.

Gender	N	Mean	Standard Deviation (S.D)	SE_D	"t" value
Boys	50	32.82	5.35	1.23	3.26 **
Girls	50	28.8	6.87		

**Highly Significant

Here, df = N1 + N2 - 2
= 50 + 50 - 2
= 98

Interpretation of the Result:

Table No. 1 indicates that the average scores for Numerical ability among boys and girls are 32.82 and 28.8, respectively. Again, the standard deviation for boys is 5.35, while for girls is 6.87.

The value of 't' for df = 98 at 0.05 level and 0.01 level of significances are 1.98 and 2.63 respectively, which is obtained from the table of critical value of 't'. Here we can see that the computed 't' value is greater than the critical 't' value. Which indicates that the 't' ratio is significant. So, the null hypothesis i.e., "There would be no significant difference between boys and girl's students in terms of Numerical ability." is rejected. This indicates that Boys possess more Numerical ability than Girls.

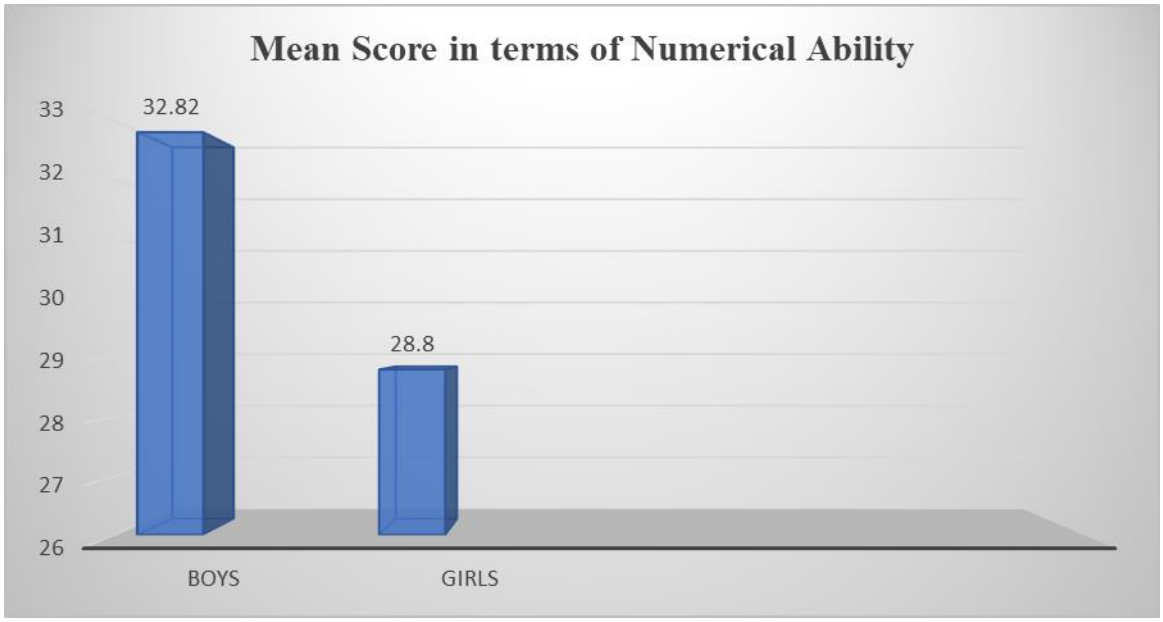

Fig 1: explains the mean score of boy's and girl's students in terms of Numerical ability.

Hypothesis – 2

There would be no significant difference between boys and girl's students in terms of science information.

Table No. 2: Showing the Difference between boy's and girl's students in terms of science information.

Gender	N	Mean	Standard Deviation (S.D)	SE_D	"t" value
Boys	50	28.16	5.72	1.27	0.71
Girls	50	27.26	6.91		

Interpretation of the Result:

As shown in Table No. 2, boys and girls score 28.86 and 27.26 on average for science information. Again girls have a 6.91 standard deviation while boys have a 5.72.

We can observe that the calculated "t" value is 0.71 in this instance. Thus, the "t" ratio does not appear to be relevant. Thus, the null hypothesis, which states that "There would be no significant difference between boys and girl's students in terms of science information," is therefore accepted. This suggests that there might not be any informational differences in science information between pupils who identify as boys and girls.

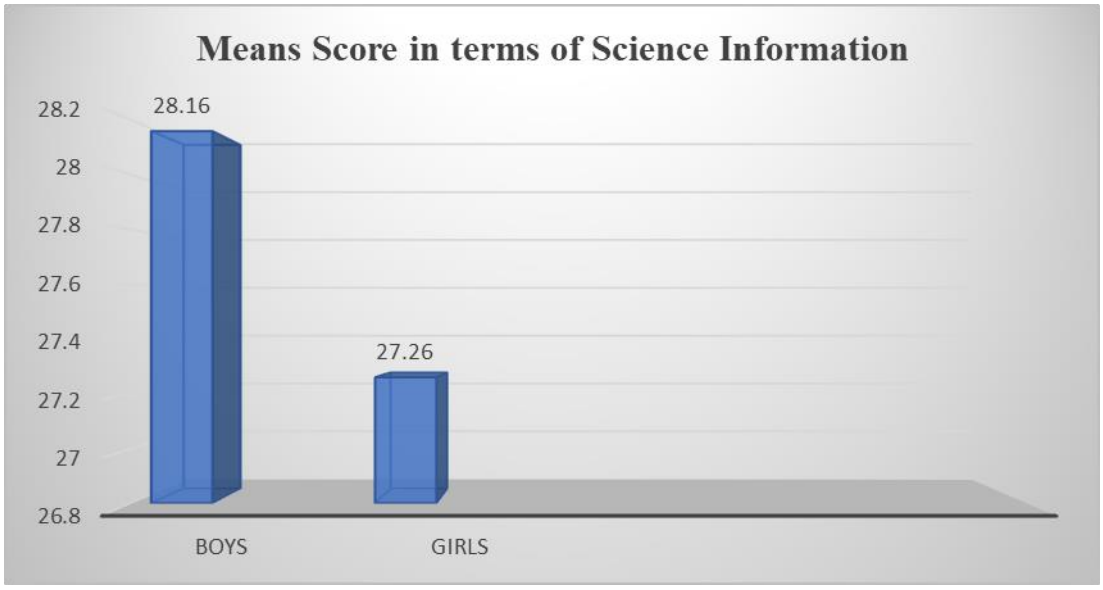

Fig 2: explains the mean score of boy's and girl's students in terms of science information.

Major Findings of the Study:

The major findings of the present study are given below-

- Boys possess more Numerical ability than Girls.
- students who identify as boys and girls share the same scientific knowledge.

Conclusion:

Significantly more study is required in this field. Research may take use of students' innate scientific aptitude to explore various learning techniques and help them convert those techniques into concrete academic accomplishment. Each new finding provides a route for future research as well as the limitations of the work that has already been done. This research is a modest attempt to investigate the scientific aptitude of Assamese secondary school students. This research is restricted to students enrolled in Assamese-medium secondary schools within the Goalpara district. Once more, knowing their children's scientific aptitudes will be helpful to parents as well as teachers.

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