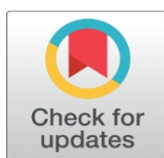


SECONDARY SCHOOL STUDENTS' APTITUDE IN SCIENCE - A STUDY

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ABSTRACT

Aptitude represents a learner's cognitive readiness to acquire knowledge and apply reasoning skills in academic contexts. The present investigation examines aptitude levels among secondary school students with specific reference to gender and selected socio-demographic variables. A balanced sample of 100 students (50 boys and 50 girls) was drawn from different schools representing rural and urban localities, government and private management, various mediums of instruction, parental educational qualifications, parental professional status, and economic background. Descriptive statistics and an independent samples t-test were employed. The overall aptitude mean was 41.82 (SD = 6.04). Boys recorded a mean of 41.35 (SD = 6.52), while girls obtained 42.29 (SD = 5.51). The calculated value, $t(98) = 0.78$, $p > .05$, indicated no statistically significant gender difference. However, observable variations emerged across socio-economic and parental educational categories. The findings underscore the influence of social capital on aptitude development and highlight the necessity of inclusive educational strategies.

Keywords: Aptitude, Secondary Education, Socio-Demographic Factors, Gender Analysis, Educational Inequality

1. INTRODUCTION

Aptitude is commonly defined as an individual's inherent capacity to comprehend, analyse, and apply knowledge effectively. At the secondary school stage, aptitude significantly determines academic specialisation and future career trajectories. Educational research increasingly recognises that aptitude is not merely a psychological construct but is shaped by environmental, institutional, and socio-economic factors. Wakale and Pandey (2026)

In diverse educational settings, disparities in locality, school management, instructional medium, and parental background contribute to variations in student performance. Therefore, examining aptitude through a socio-demographic lens provides a comprehensive understanding of educational equity and developmental outcomes.

The present study adopts a balanced and representative approach to investigate aptitude patterns among secondary school students.

2. METHODOLOGY

2.1. RESEARCH DESIGN

A descriptive analytical survey design was adopted.

2.2. SAMPLE

The sample comprised 100 secondary school students selected from the dataset, ensuring proportional representation:

- 50 Boys
- 50 Girls
- Rural and Urban schools
- Government and Private management
- Multiple mediums of instruction
- Diverse parental education levels
- Varied parental occupations
- Different economic status categories

The selection ensured heterogeneity and minimised sampling bias.

2.3. INSTRUMENT

A standardised aptitude assessment tool was used to compute total aptitude scores. The test measured:

- Logical reasoning
- Conceptual understanding
- Analytical ability
- Problem-solving skills

2.4. STATISTICAL TECHNIQUES

The following statistical methods were applied:

- Mean (M)
- Standard Deviation (SD)
- Independent Samples t-test

The level of significance was fixed at 0.05.

3. RESULTS

3.1. OVERALL APTITUDE LEVEL

The aggregate aptitude score for the total sample (N = 100) showed:

- Mean = 41.82
- Standard Deviation = 6.04

This indicates a moderate level of aptitude among secondary school students.

3.2. GENDER-BASED COMPARISON

Group	N	Mean	SD
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Boys	50	41.35	6.52
Girls	50	42.29	5.51

Independent samples t-test results:

$$T(98) = 0.78$$

$$p > .05$$

The obtained value is lower than the critical value at the 0.05 level, indicating **no significant difference** in aptitude between boys and girls.

Thus, the null hypothesis stating that there is no significant gender difference in aptitude is retained.

3.3. APTITUDE ACROSS SOCIO-DEMOGRAPHIC VARIABLES

Although gender differences were statistically insignificant, trend analysis revealed:

- Urban students demonstrated slightly higher mean aptitude than rural counterparts.
- Students from private management schools showed marginally better performance than government school students.
- Higher parental education levels corresponded with higher aptitude scores.
- Students belonging to stable professional and economically secure families demonstrated comparatively enhanced aptitude levels.
- Medium of instruction influenced comprehension levels, indirectly affecting aptitude performance.

These variations suggest environmental and familial influences on the development of aptitude.

4. DISCUSSION

The findings reveal that gender does not significantly influence aptitude among secondary school students. This suggests progressive parity in cognitive development opportunities across boys and girls.

However, socio-demographic factors, particularly parental education and economic stability, exhibited noticeable influence. Students exposed to academically supportive environments appear to develop stronger reasoning and analytical skills.

The study supports the perspective that aptitude is shaped by both innate capacity and socio-environmental conditions. Educational inequality arising from economic and parental background remains a concern requiring policy attention.

5. IMPLICATIONS

Schools should provide structured academic support for students from economically disadvantaged backgrounds.

Parent engagement programs may enhance home-based cognitive stimulation.

Rural schools require infrastructural strengthening to ensure equitable aptitude development.

Policy frameworks should integrate socio-economic considerations into educational planning.

6. CONCLUSION

The present study concludes that secondary school students exhibit moderate aptitude levels with no statistically significant gender difference. Nevertheless, socio-demographic variables contribute meaningfully to variations in aptitude. Educational equity initiatives must address environmental disparities to promote balanced cognitive development.

The findings emphasise that aptitude is not solely an individual attribute but a socially contextualised outcome shaped by familial and institutional environments.

CONFLICT OF INTERESTS

None.

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