Achievement in Mathematics and its Relationship with Home Environment at the Secondary Students of Varanasi

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Abstract

The study investigates the correlation between the home environment and mathematics achievement among secondary school students in the Varanasi region. Education is a holistic process, and the home acts as the primary agency for a child's development. By examining a sample of 200 students, the research aims to identify how domestic dimensions such as parental support and cognitive stimulation influence academic outcomes in the subject of mathematics.

1. Introduction

The family is the "cradle" of social training, manners, and discipline. All-round development—physical, mental, and spiritual—starts at home and continues through higher education. Jean Piaget emphasized that cognitive development occurs through interaction with the environment, and parents play an essential role in helping children excel academically at all levels.

For a child to succeed in mathematics there must be a stable foundation involving routines, boundaries, and family communication. A home environment that encourages reading and problem-solving helps students become lifelong learners. Conversely, an unhealthy atmosphere can lead to academic dullness and lack of interest. Mathematics is a unique discipline that requires concentration and organized behavior, making the home environment a critical factor in its mastery.

2. Statement of the Problem

Achievement in mathematics is governed by many factors, both intellective and non-intellective. The home is the immediate socializing agent that impacts a student's character and career. The study specifically addresses: **"Achievement in mathematics and its relationship with Home Environment at the secondary students of Varanasi"**.

3. Significance of the Study

The study is significant because education is an instrument for all-round development. By analyzing dimensions like freedom, discipline, reward, and parental support, this research provides insights for teachers, counselors, and educational thinkers to improve student quality.

4. Objectives and Hypotheses

The research focuses on three primary objectives:

1. To identify the home environment of secondary school students.
2. To study the relationship between home environment and mathematics achievement in Non-Government schools.
3. To study the relationship between home environment and mathematics achievement in Government schools.

Eleven null hypotheses (HO) were formulated to test for significant differences and relationships across gender, school types, and environmental factors.

5. Methodology

1. **Sample**: 200 IXth grade students (100 boys and 100 girls).
2. **Area**: Government and Non-Government schools in Varanasi district.
3. **Variables**: Mathematics Achievement (Dependent) and Home Environment (Independent).
4. **Tools**: A standardized "Home Environment Inventory" was administered, using Likert's three-point scale for scoring.
5. **Data Analysis**: Reliability was established via test-retest. Statistical methods included t-tests, SD, and Pearson's correlation ('r').

6. Major Findings and Analysis

The statistical analysis yielded several critical results regarding how different demographics experience their home lives and academic results:

Group Comparison	**'r' Value**	**Significance at 0.05**	**Finding**
Govt. Boys vs. Govt. Girls	0.76	Not Significant	No significant difference in home environment.
Non-Govt. Boys vs. Non-Govt. Girls	0.57	Not Significant	No significant difference in home environment.
Govt. Boys vs. Non-Govt. Boys	0.65	Not Significant	No significant difference in home environment.
Govt. Girls vs. Non-Govt. Girls	**2**	**Significant**	Significant difference in home environment.
Govt. Total vs. Non-Govt. Total	1.94	Not Significant	No significant difference overall.

Correlation with Mathematics Achievement:

1. **Government Girls**: A significant relationship exists between their home environment and mathematics achievement ($r = -0.53$).
2. **Total Government Students**: A significant relationship was found ($r = -0.52$).
3. **Total Non-Government Students**: A significant relationship was found ($r = 0.75$).
4. **Boys (Both Sectors)**: No significant relationship was found between their home environment and mathematics achievement.

7. Discussion and Conclusion

The study concludes that the home environment is a definitive factor in mathematics achievement.

1. **Parental Influence**: If parents are proficient in mathematics or are highly educated, student achievement tends to be higher.
2. **Environmental Stability**: A good home atmosphere, combined with favorable economic status, provides a better chance for academic success.
3. **Intergenerational Impact**: Educated grandparents also positively influence their grandchildren's learning.

8. Educational Implications

1. **Teacher Awareness**: Teachers should identify students with negative home environments to provide targeted support and "proper treatment".
2. **Diagnostic Tools**: The Home Environment Inventory can help educators pinpoint which specific dimension (e.g., parental support or cognitive stimulation) is causing trouble for the student.
3. **Classroom Climate**: Since teachers are influential, they should create a favorable and pleasant classroom environment to mitigate lack of support at home.
4. **Holistic Responsibility**: Both schools and teachers must contribute to improving the student's outlook toward education.

Reference

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