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A Study Of Academic Achievement In Science Among Higher Secondary Students In Relation To Home Environment, Locality, And Gender

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Abstract

This study aimed to investigate the relationship between academic achievement in science and the home environment among higher secondary students. The study was conducted in the East Singhbhum district of Jharkhand state. A descriptive survey method was employed, and a sample of 500 higher secondary students was selected using a stratified random sampling technique. Academic achievement was obtained through the score on the Science Achievement test by Dr. R.D. Singh. The home environment score was obtained by the Home Environment Scale by Aaliya Akhtar and Shailbala Saxena. It was found that the academic achievement of higher secondary students was significantly correlated with the home environment. It was obtained that there was a significant correlation between the academic achievement and home environment of urban higher secondary students. Similarly, a significant correlation was found between the academic achievement and home environment of rural higher secondary students. A significant correlation was found between the academic achievement and home environment of male higher secondary students. A significant correlation was also found between the academic achievement and home environment of female higher secondary students.

Keywords: Home environment, Academic achievement in science, Locality, Gender

In this era of science, technology, and globalization, education is considered very important for the development of human capital (Sakia, 2016). It is a tool for bringing out the talents and potential of the students and utilizing them for the development of society (Kishore, 2013). The quality of performance of students is an indicator of their progress in life. Schools, teachers, and parents are working hard to help students achieve better in school and become successful in their personal lives (Khan, 2011).

Achievement refers to all the behavioral changes that occur in an individual as a result of the experiences provided to students during the learning process. It is usually considered the academic status of any student in subjects and different contents (Panda, 1998).

Eysenck et al. (1972) in their Encyclopedia of Psychology, described achievement as the successful attainment of some goals. It is the degree of success attained in a task (Parveen, 2014).

The quality of education is a priority for educators, as it affects individual progress, national progress, and the overall progress of society. All over the world, educators are studying data regarding academic achievement obtained after testing cognitive skills in various assessments. Every nation is organizing tests, which may be teacher-made or standardized. However, they differ in grade level, subject matter, and quality of tests. International tests are also being organized in subjects such as mathematics, Science, and reading abilities to gain insight into the factors that determine student achievement. (Hanushek and Woessmann 2017). Educators are analyzing numerous data to know why some students are performing better than others on standardized tests (Lewit, 1997).

Several factors, both within and outside the school, are linked to the quality of students' academic achievement (Farooq, 2011). These factors may also be referred to as student factors, family factors, school factors, and peer factors (Crosnoe, Johnson, and Elder, 2004). Demographic factors include age, gender, ethnicity, marital status, socioeconomic status, parents' education, parents' occupation, and parents' income (Ballantine, 1993). Among all these predictors of academic achievement, the home environment is a significant factor that influences a student's academic performance.

The home environment consists of physical and psychological elements. The physical aspect encompasses basic facilities, such as the house's infrastructure, food, and clothing, while the psychological aspect involves the mutual interactions among family members. Both aspects contribute to the overall development of the students (Muola, 2010).

According to the UNICEF report 2023 titled 'Home Environment', the importance of the home environment in the survival and development of young children is clearly stated. It also says that good physical conditions and learning resources at home, like books, provide opportunities to learn and proper cognitive development. Children from High socioeconomic status are receiving better learning environments than their low socioeconomic status counterparts (UNICEF report, Home Environment, 2023).

A supportive and nurturing environment at home can foster a safe and comfortable psychological atmosphere, whereas unfavorable conditions may create a stressful and problematic psychological atmosphere. Some studies suggest that better parenting and favorable home conditions contribute to improved development of gross and fine motor skills, cognitive abilities, reading, writing, and social skills. A supportive home environment has a greater influence on child development than socioeconomic

factors such as parental income, occupation, education, and home resources (Kapur, Grimaji, Prabhu, and Reddy, 1994).

Several studies have shown a significant correlation between the home environment and students' academic achievement. Saru Joshi (2012) found a positive correlation between home environment and academic achievement. N. Kishore (2013) also found a substantial impact of the home environment on academic success. Pandey Ramashankar also identified a positive relationship between home environment and academic achievement. Dibyajyoti Mahanta (2014) revealed a positive correlation between home environment and students' Mathematics achievement. Dev Meenu (2016) also observed a positive correlation between students' academic achievement and their home environment. Although several studies have been conducted, very few have focused on academic achievement in science subjects and their relation to the home environment. Therefore, the researcher stated the research problem as

"A Study of Academic Achievement in Science in relation to Home Environment, Locality, and Gender."

Objective of the study:

The main objectives of the study were as follows:

Objective 1: To study the relationship between academic achievement in Science and the Home environment of the Higher Secondary students

Objective 2: To investigate the relationship between Academic Achievement in Science and the Home Environment of urban higher secondary students

Objective 3: To find out the relationship between Academic Achievement in Science and the Home Environment of rural higher secondary students

Objective 4: To find out the relationship between Academic Achievement in Science and the Home Environment of male higher secondary students

Objective 5: To find out the relationship between Academic Achievement in Science and the Home Environment of female higher secondary students

Hypotheses of the study:

Null Hypotheses of the study were as follows:

Hypothesis 1: There is no significant correlation between Academic Achievement in Science and the Home Environment of the higher secondary student

Hypothesis 2: There is no significant correlation between Academic Achievement in Science and the Home Environment of urban higher secondary students.

Hypothesis 3: There is no significant correlation between Academic Achievement in Science and the Home Environment of rural higher secondary students.

Hypothesis 4: There is no significant correlation between Academic Achievement in Science and the Home Environment of male higher secondary students.

Hypothesis 5: There is no significant correlation between Academic Achievement in Science and the Home Environment of female higher secondary students.

Method of the study:

The Descriptive Survey Method was adopted for the study.

Population and Sample:

The population included all students attending the higher secondary level in all government and government-aided schools, as well as all intercolleges in East Singhbhum District that were affiliated with the Jharkhand Academic Council. The Stratified Random Sampling method was used to select 500 students.

Tools for the collection of data:

Data was collected with the help of standardized tools, which were as follows:

1. **Science Achievement Test (SAT) by Dr. R. D. Singh:** This Test consisted of a total of 86 items. Forty-two questions were from Physics, while forty-four questions were from Chemistry. The reliability of the test was 0.97 by the split-half method. The content validity of the test was satisfactory.
2. **Home Environment Scale by Aaliya Akhtar and Dr. Shail Bala Saxena (HES-AASS):** The Home Environment Scale, developed by Aaliya Akhtar and Dr. Shail Bala Saxena, includes fifty items across ten dimensions. These dimensions are Protectiveness, Parental Involvement, Academic Stimulations, Reward, Parental Warmth, Punishment, Participation in Home Affairs, Control, Permissiveness, and Parental Expectations. The split-half reliability of the test is 0.74, and its concurrent validity was confirmed through comparison with K.S. Mishra's Home Environment Inventory.

Data analysis and findings:

Data were collected systematically, categorized, and then analyzed using the mean, Standard deviation, and Pearson Product-Moment Correlation coefficient.

Objective 1 of the study was to study the relationship between academic achievement in Science and the Home environment of the Higher Secondary students.

Pearson Product-Moment Correlation Coefficient was computed, and the result was as follows:

Table 1: Pearson Product-Moment Correlation between Academic Achievement in Science and Home Environment of Higher Secondary Students

Variables	No. of students	Value of r	Type of correlation	Significance value
Academic Achievement in Science and Home Environment of Higher Secondary Students (Total)	500	0.2460	Positive	0.05

Significant at the 0.01 level

The coefficient of correlation was 0.2460 for the degree of freedom 498. From the table of correlation, it was found to be 0.115 at the 0.01 level of significance. Therefore, the value of r obtained was greater than the table value. So, the null hypothesis is rejected, and a significant positive relationship was found between the academic achievement in Science and the home environment of higher secondary students(total).

Objective 2 of the study was to investigate the relationship between academic achievement in Science and the Home environment of urban higher secondary students. To test the hypothesis, the Pearson Product-Moment correlation coefficient was computed.

Table 2: Pearson Product-Moment Correlation between Academic Achievement in Science and Home Environment of Urban Higher Secondary Students

Variables	No. of students	Value of r	Type of correlation	Significance value
Academic Achievement in Science and Home Environment of Urban Higher Secondary Students	256	0.1503	Positive	0.01

Significant at the 0.01 level

The coefficient of correlation was 0.1503 for the degree of freedom 254. From the table of correlation, a value of 0.148 was found at the 0.01 level of significance. The value of r obtained was greater than the

table value, so the null hypothesis was rejected. A significant positive relationship was found between academic achievement in Science and the home environment of urban students at the 0.01 level of significance.

Objective 3 of the study was to investigate the relationship between academic achievement in Science and the Home environment of rural higher secondary students. To test the hypothesis, the Pearson Product-Moment correlation coefficient was computed.

Table 3: Pearson Product-Moment Correlation between Academic Achievement in Science and Home Environment of Rural Higher Secondary Students

Variables	No. of students	Value of r	Type of correlation	Significance value
Academic Achievement in Science and Home Environment of Rural Higher Secondary Students	244	0.206	Positive	0.01

Significant at the 0.01 level

The coefficient of correlation was 0.206 for the degree of freedom 242. From the table of correlation, a value of 0.148 was found at the 0.01 level of significance. The value of r obtained was greater than the table value, so the null hypothesis was rejected, and it was found that there was a significant positive relationship between academic achievement in Science and the home environment of rural higher secondary students.

Objective 4 of the study was to investigate the relationship between academic achievement in Science and the Home environment of male higher secondary students. To test the hypothesis, the Pearson Product-Moment correlation coefficient was computed.

Table 4: Pearson Product-Moment Correlation between Academic Achievement in Science and Home Environment of Male Higher Secondary Students

Variables	No. of students	Value of r	Type of correlation	Significance value
Academic Achievement in Science and Home Environment of Male Higher Secondary Students	253	0.1554	Positive	0.01

Significant at the 0.01 level

The coefficient of correlation was 0.1554 for a degree of freedom of 251. From the table of correlation, a value of 0.148 was found at the 0.01 level of significance. Therefore, the value of r obtained was greater than the table value. Therefore, the null hypothesis was rejected, and a significant positive relationship

was found between academic achievement in Science and the Home Environment of male higher secondary students at the 0.01 level.

Objective 5 of the study was to investigate the relationship between academic achievement in Science and the Home environment of female higher secondary students. To test the hypothesis, the Pearson Product-Moment correlation coefficient was computed.

Table 5: Pearson Product-Moment Correlation between Academic Achievement in Science and Home Environment of Female Higher Secondary Students

Variables	No. of students	Value of r	Type of correlation	Significance value
Academic Achievement in Science and Home Environment of Female Higher Secondary Students	247	0.3416	Positive	0.01

Significant at the 0.01 level

The coefficient of correlation was 0.3416 for the degree of freedom 245. From the table of correlation, a value of 0.148 was found at the 0.01 level of significance. The value of r obtained was greater than the table value, so the null hypothesis was rejected. So, a significant relationship was found between the Academic Achievement in Science and the Home Environment of Female Higher Secondary Students at the 0.01 level.

Conclusion:

Based on the analysed data, the following conclusions were drawn:

11. A significant relationship was found between the academic achievement in Science and the home environment of higher secondary students (Total) at the 0.01 level of significance.

12. A significant positive relationship was found between academic achievement in Science and the home environment of urban Higher secondary students at the 0.01 level of significance.

13. A significant positive relationship was found between academic achievement in Science and the home environment of rural students at the 0.01 level of significance.

14. A significant positive relationship was found between academic achievement in Science and the Home Environment of male higher secondary students at the 0.01 level of significance.

15. A significant relationship was found between the Academic Achievement in Science and the Home Environment of Female Higher Secondary Students at the 0.01 level of significance

Educational implications:

The current study examined the link between academic achievement in science and the home environment of higher secondary students. The findings may aid educational planners, teachers, psychologists, administrators, and parents, who are key stakeholders in the education system.

Further research could be conducted in various cities across Jharkhand or throughout the entire state. It can also be carried out by choosing different subjects or types of educational institutions.

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