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A STUDY ON ACHIEVEMENT IN PHYSICS IN RELATION TO LEARNING ENVIRONMENT OF HIGHER SECONDARY STUDENTS

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Abstract

The present study is on Achievement in Physics in Relation to Learning Environment of Higher Secondary Students. The main objective of this study was to find out the relationship between Achievement in Physics and Learning Environment of higher secondary students. Achievement in Physics Test (APT) and Learning Environment Scale are Constructed and Validated by Evelin Liza Sthevan S and Dr. S. Manivannan (2024) was adopted for the data collection. The data was collected from 668 higher secondary students studying in Kanniyakumari District by adopting simple random sampling technique. This study proved that Achievement in Physics and Learning Environment is average, there is significant difference in the Achievement in Physics and Learning Environment of higher secondary students with respect to their gender, student residence. There is a significant positive relationship between Learning Environment and Achievement in Physics of Higher Secondary Students.

***Key Words**: Achievement in Physics, Learning Environment, Gender and Student Residence*

Introduction

Physics is one of the oldest academic disciplines and, through its inclusion of astronomy, perhaps the oldest. Over the last two millennia, physics, chemistry, biology, and certain branches of mathematics were a part of natural philosophy, but during the scientific revolution in the 17th century, these natural sciences emerged as unique research endeavors in their own right. Physics intersects with many interdisciplinary areas of research, such as biophysics and quantum, and the boundaries of physics are not rigidly defined. New ideas in physics often explain the fundamental mechanisms studied by other sciences and suggest new avenues of research in academic disciplines such as mathematics and philosophy.

Learning is a key process in human behavior. Learning is a complex, interrelated system of accessing information, getting it into the brain, and processing the information to solve problem or support activities. Learning styles are personal way in which individual process information's and the courts of learning new concepts and principles. Learning environment differ from individual to individual. For the same individual they differ from the subject to subject. As per the definitions offered by Rosenberg, "Learning refers to an individual's characteristic pattern of behavior when con fronted with a problem". In simple language, a learning approach to learning a task is his learning style. It is his predisposition of behavior in learning situations. The learning environment of individual may facilitates learning of certain subjects and deliberates learning of certain other subjects. Knowing the learning environment of individuals could help the teacher to identify remedies to improve achievement as per their learning style. Rosenberg (1978) classified learning environment based on the learner behavior in a learning situation. A study of learning environment could help the investigator to find out the influence of prominent learning environment on the learning of the individuals.

Need for the study

Physics subject play a vital part in the branch of science courses. It is the emerging constituent of any science based professional courses like Agriculture, Medicine and Engineering etc., And there are many factors that greatly influence the knowledge about physics among Higher Secondary Students like science attitude, science interest, science motivation, achievement motivation, learning environment, school environment, problem solving ability, pedagogical factors and technological factors etc., Among which the learning environment is the most influential factors as per the physics knowledge development is concerned.

Title of the Problem

The present study is stated as "**A Study on Achievement in Physics in Relation to Learning Environment of Higher Secondary Students**".

Operational Definitions of Terms

The following are the operational definitions of the terms used for present study.

Achievement in Physics

Achievement in Physics is the knowledge attained or skills developed in the school subjects. In this study, the investigator finds out the knowledge and skills development of students in their subjects with the help of test.

Learning Environment

Learning environment refers to the diverse physical locations, contexts, and cultures in which students learn.

Objectives of the Study

1. To find out the level of Achievement in Physics of Higher Secondary Students.
2. To find out the level of Learning Environment of Higher Secondary Students is low.
3. To find out the whether there is any significant difference between the Male and Female Higher Secondary Students with respect to their Achievement in Physics.
4. To find out the whether there is any significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Achievement in Physics.
5. To find out the whether there is any significant difference between the Male and Female Higher Secondary Students with respect to their Learning Environment.
6. To find out the whether there is any significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Learning Environment.
7. To find out the whether there is any significant relationship between Achievement in Physics and Learning Environment of Higher Secondary Students.

Hypotheses of the Study

1. The level of Achievement in Physics of Higher Secondary Students is low.
2. The level of Learning Environment of Higher Secondary Students is low.
3. There is no significant difference between the Male and Female Higher Secondary Students with respect to their Achievement in Physics.
4. There is no significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Achievement in Physics.
5. There is no significant difference between the Male and Female Higher Secondary Students with respect to their Learning Environment.
6. There is no significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Learning Environment.
7. There is no significant relationship between Achievement in Physics and Learning Environment of Higher Secondary Students.

Methodology

The present study was a normative survey which was intended to measure the Achievement in Physics and Learning Environment of Higher Secondary Students. The data was collected from 668 XI standard physics students in Kaniyakumari district by adopting simple random sampling method.

Tools Used of the study

Achievement in Physics Test (APT) and Learning Environment Scale are Constructed and Validated by Evelin Liza Sthevan S and Dr. S. Manivannan (2024).

Results and discussion

The investigator collected the relevant data and subjected it to statistical analysis. Tables shows the Descriptive, Differential and Correlation analysis.

Descriptive Analysis

Null Hypothesis 1

The level of Achievement in Physics of Higher Secondary Students is low.

Table-1

Mean and Standard Deviation Scores for the Achievement in Physics

Variable	N	Mean	SD
Achievement in Physics	668	26.74	6.12

From table-1, the calculated mean and standard deviation for Achievement in Physics scores of the entire sample is found to be 26.74 and 6.12 respectively, which is the mean score lay in between (M±σ) value i.e., 22 to 39. Hence, the framed hypothesis (1) is rejected and it is concluded that the Achievement in Physics of Higher Secondary Students is average.

Null Hypothesis 2

The level of Learning Environment of Higher Secondary Students is low.

Table-2

Mean and Standard Deviation Scores for the Learning Environment

Variable	N	Mean	SD
Learning Environment	668	136.24	26.40

From table-2, the calculated mean and standard deviation for Learning Environment scores of the entire sample is found to be 136.24 and 26.40 respectively, which is higher than the percentile 25 and lower than the percentile value i.e., 92 to 163. Hence, the framed hypothesis (2) is rejected and it is concluded that the Learning environment of Higher Secondary Students is average.

Differential Analysis

Null Hypothesis 3

There is no significant difference between the Male and Female Higher Secondary Students with respect to their Achievement in Physics.

In order to test the above Null hypothesis 't' value is calculated.

Table-3

Significant difference between the Mean Achievement in Physics Scores of Higher Secondary Students with respect to their Gender

Variable	Gender				't' Value	Level of Significance at 0.05 Level
	Male(352)		Female(316)			
	Mean	SD	Mean	SD		
Achievement in Physics	25.71	5.34	30.21	6.42	3.81	Significant

From the above table, since that the 't' value calculated is 3.81, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the null hypothesis 3 is rejected and it is concluded that there is significant difference between the Male and Female Higher Secondary Students with respect to their Achievement in Physics. It is also found that Female students are having better Achievement in Physics than the Male students.

Null Hypothesis 4

There is no significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Achievement in Physics.

In order to test the above Null hypothesis 't' value is calculated.

Table-4

Significant difference between the Mean Achievement in Physics Scores of Higher Secondary Students with respect to their Residential Area

Variable	Residential Area				't' Value	Level of Significance at 0.05 Level
	Rural(307)		Urban(361)			
	Mean	SD	Mean	SD		
Achievement in Physics	25.48	6.60	29.54	5.88	2.22	Significant

From the above table, since that the 't' value calculated is 2.22, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the null hypothesis 4 is rejected and it is concluded that there is significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Achievement in Physics. It is also found that Urban resident students are having better Achievement in Physics than the Rural resident students.

Null Hypothesis 5

There is no significant difference between the Male and Female Higher Secondary Students with respect to their Learning Environment.

In order to test the above Null hypothesis 't' value is calculated.

Table-5

Significant difference between the Mean Learning Environment Scores of Higher Secondary Students with respect to their Gender

Variable	Gender				't' Value	Level of Significance at 0.05 Level
	Male (352)		Female (316)			
	Mean	SD	Mean	SD		
Learning Environment	131.47	27.70	139.88	24.48	3.70	Significant

From the above table, since that the 't' value calculated is 3.70, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the null hypothesis 5 is rejected and it is concluded that there is significant difference between the Male and Female Higher Secondary Students with respect to their Learning Environment. It is also found that Female students are having better Learning Environment than the Male students.

Null Hypothesis 6

There is no significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Learning Environment.

In order to test the above Null hypothesis 't' value is calculated.

Table 6

Significant difference between the Mean Learning Environment Scores of Higher Secondary Students with respect to their Residential Area

Variable	Residential Area				't' Value	Level of Significance at 0.05 Level
	Rural(307)		Urban(361)			
	Mean	SD	Mean	SD		
Learning Environment	136.72	24.60	142.68	28.05	2.14	Significant

From the above table, since that the 't' value calculated is 2.14, which is greater than the table value 1.96 at 0.05 level of significance. Hence, the null hypothesis 6 is rejected and it is concluded that there is significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Learning Environment. It is also found that Urban resident students are having better Learning Environment than the Rural resident students.

Correlation Analysis

Hypothesis 7

There is no significant relationship between Achievement in Physics and Learning Environment of Higher Secondary Students.

Table-7

Coefficient of correlation between Achievement in Physics and Learning Environment of Higher Secondary Students

Variable	N	'r' Value	Level of Significance At 0.05 Level
Achievement in Physics and Learning Environment	668	0.419	Significant

Correlation at 0.05 level

From the table-7, the obtained coefficient of correlation (r) between Achievement in Physics and Learning Environment of High Secondary Students is found to be 0.419 which is significant at 0.05 ($p<0.05$). Hence the above stated null hypothesis is rejected at 0.05 level of significance and it is concluded that there is a significant and positive relationship between Achievement in Physics and Learning Environment of Higher Secondary Students, that is, Higher Secondary Students who are having more sense of Learning Environment have better Achievement in Physics and vice-versa.

Findings of the Study

- The Achievement in Physics of Higher Secondary Students is average.
- The Learning environment of Higher Secondary Students is average.
- There is significant difference between the Male and Female Higher Secondary Students with respect to their Achievement in Physics.
- There is significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Achievement in Physics.
- There is significant difference between the Male and Female Higher Secondary Students with respect to their Learning Environment.
- There is significant difference between the Rural and Urban resident Higher Secondary Students with respect to their Learning Environment.
- There is a significant and positive relationship between Achievement in Physics and Learning Environment of Higher Secondary Students.

Conclusion

This study proved that there is a significant positive relationship between achievement in physics and learning environment. This study will be a lime light for the teacher to understand that the type of learning environment of students plays a vital role in achievement. Thus it is important to understand the students' learning environment and to practice best learning environment among our students. This study also helps the teacher to identify and remediate the Rigid – Inhibited learning style and Indisciplined Learning Environment students. Once the learning environment of the students are identified, the teacher will adopt the suitable teaching method as per the group. Thus, this study strongly evinced the importance of learning styles in the teaching – learning process.

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