

Examination of the Difference in School Attendance and Academic Achievement

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ABSTRACT

In today's education system, students' consistent presence will help them to gain more academic knowledge. This study aims to identify any significant differences in academic performance based on varying levels of attendance by employing the method of two-way Analysis of Variance (ANOVA) test. By utilizing this statistical technique, the Correlation between student attendance and academic performance and also which school has showed great academic performance with respect to attendance can be found out. To conduct this analysis, a comprehensive dataset comprising attendance records and corresponding academic marks of particular subject will be collected from schools of various districts of Tamil Nadu. The attendance data will be obtained from attendance registers, while academic performance will be measured based on assignments, internal test marks and other relevant indicators. The school with overall best academic performance will be identified using arithmetic mean operation. If a positive correlation between attendance and academic performance is established, it will emphasize the importance of promoting regular attendance among students. By analyzing the variance between attendance and student's performance, we try to gain a deeper understanding of the impact of attendance on students' overall achievements across the state. This research has significant importance to provide valuable insights for educators and policymakers in enhancing educational outcomes. This paper, in addition, will show the importance of implementation of strategies such as rewards and incentives to improve attendance rates.

Keywords: Arithmetic Mean, Variance, Correlation, Significance, Degrees of freedom

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1. Introduction

Attendance and academic performance of students are closely intertwined. Attending classes consistently ensures that students do not miss out on vital lectures, discussions, and valuable learning experiences facilitated by educators. By being present in class, students have the opportunity to actively engage with course material, ask questions and seek clarification. Attendance also helps develop discipline and time management skills. Moreover, consistent attendance demonstrates commitment towards studies and sends a positive message to both professors and peers about one's dedication to education. When a student takes leave and misses lessons, they may rely on their peers to catch up on what was taught in class. However, this approach may not be as effective as receiving instruction from the faculty themselves. As students, we have personally experienced this challenge. Therefore, we aim to conduct research to substantiate the claim that attendance significantly influences academic performance.

2. Objective of This Study

The decline in students' attendance rates is a major concern that has captured the attention of education institutions. Several factors contribute to this decline, such as societal changes, technological distractions, and disengagement with traditional teaching approaches. Addressing this issue requires a multi-faceted approach involving collaboration between educators and parents. Some of the reasons for this decline is listed below.

- **Medical illness:** When the organization thinks of absences, the reason of falling sick typically springs to mind. Although occasionally inevitable, there exist strategies for families to mitigate absences caused by illness and guarantee their child receives the education they rightfully deserve.
- **Bullying:** While academic challenges may be a significant problem for numerous students, bullying exaggerates the issue by creating an unsafe environment in schools, both physically and emotionally.
- **Mental health:** Mental and emotional health issues are indeed a major cause for school absenteeism. However, it is crucial for families to collaborate with schools in order to ensure students' progress, as prolonged absences can worsen both academic and emotional challenges. It is important to address these issues in a professional and cooperative manner to facilitate the well-being of students.

Consistent attendance is crucial for maintaining continuity in learning. Each day at school builds upon the previous one, and any absence can lead to significant gaps in knowledge. By attending school regularly, students can progress smoothly through the curriculum without missing out on crucial information. Moreover, schools play a vital role in cultivating habits that are essential for future success. Punctuality, reliability, and commitment are highly valued traits sought after by employers and higher education institutions. Regular attendance instills these qualities in students, effectively preparing them for the demands of the professional world.

Thus, the aim of our study is to determine the correlation between student attendance and academic performance. Additionally, we aim to identify the schools where students have excelled academically. Through our analysis, we will uncover the influence of attendance on students' grades. This research will provide valuable insights into the relationship between attendance and academic achievement.

3. Material and Methods

For this study, we approached five higher secondary schools across various districts of Tamil Nadu, namely Trichy, Thanjavur, Dindigul, Karaikudi, and Nagapattinam. We collected data on attendance and annual grade marks in subjects such as English, Physics, Chemistry and Biology of about two hundred students from 11th grade in these schools.

To determine if there is a significant difference between attendance and academic performance, we conducted a two-way ANOVA test. Additionally, we utilized the arithmetic mean function to assess the

performance of each school and identify the top-performing institution. The inclusion of multiple districts ensures a diverse sample, allowing for a more comprehensive understanding of the overall educational landscape in Tamil Nadu. By examining the performance of students in subjects like English, Language, and Mathematics, we can assess their proficiency across different disciplines.

The two-way ANOVA test serves as a statistical tool to determine if there is a significant difference between attendance and academic performance. This analysis will provide valuable information on the impact of attendance on student achievement, helping educators and policymakers make informed decisions to improve educational outcomes. Furthermore, by calculating the arithmetic mean of the grade marks for each school, we can identify the top-performing institution. This information can be used to recognize and celebrate the efforts of schools that excel in fostering academic excellence.

4. Prototype of the study

We collected data from five higher secondary schools across various districts of Tamil Nadu, namely Trichy, Thanjavur, Dindigul, Karaikudi, and Nagapattinam. We collected data on attendance and annual grade marks in subjects such as English, Physics, Chemistry and Biology of about two hundred students from 11th grade in these schools. The annual grade mark has been adjusted to 50. Therefore, the maximum attainable mark is now 50, while the maximum attendance percentage remains at 100.

Table 1: Attendance percentage Vs Average marks

Attendance (In %)	Average mark in English	Average mark in Physics	Average mark in Chemistry	Average mark in Biology
Above 80%	33	33	38	39
60% - 80%	32	34	37	39
Below 60%	31	33	36	38

Before conducting the case study, it is imperative to assume the hypothesis. Once the hypothesis has been assigned, we can proceed with analyzing its validity. In light of this specific analysis, we have considered two statements as follows:

Null Hypothesis H_0 : There is no significant difference between attendance and average mark. Taking leave and missing classes doesn't affect the academic performance.

Alternative Hypothesis H_0 : There is a significant difference between attendance and average mark.

Taking leave and missing classes affect the academic performance.

In order to conduct a comprehensive analysis, we will be considering two key attributes, attendance and average marks. To perform a two-way ANOVA test, we followed a series of steps outlined below:

1. Calculate the total sum of rows and columns, determining the row and column totals.
2. Compute the grand total by summing the squares of each term in both rows and columns.
3. Determine the degrees of freedom for each attribute.
4. Proceed to calculate the sum of squares for both attributes, as well as the error.
5. Calculate the mean Squares for the attributes and the error.
6. Finally, derive the variance ratio from the mentioned calculations.

By meticulously following these steps, we effectively analyzed and the below added ANOVA table shows the results.

Table 2: ANOVA

Attributes	Degrees of freedom	Sum of squares	Mean squares	Variance Ratio (F- Ratio)	Table value
Between the attendance percentage	2	3.5	1.75	F1=5.737	F1(2,6) =5.14
Between the marks	3	86.85	28.97	F2=94.305	F2(3,6) =4.76
Errors	6	1.83	0.305		
Total	11	92.25			

Upon comparing the calculated value with the table value, it becomes evident that the calculated F-Ratio exceeds the expected value. Consequently, our hypothesis is rejected, indicating a significant difference between attendance and average marks. This finding underscores the impact of class absences on students' academic performance. After calculating the arithmetic mean of marks achieved by students in each school, it has been determined that Trichy has secured the top position in terms of student performance.

Table 3: Average Marks achieved Districts wise

Districts	Average Marks
Trichy	40
Thanjavur	38
Nagapattinam	37
Dindigul	34
Karaikudi	34

5. Conclusion

Thus, this study presents a comprehensive analysis of attendance and academic performance in higher secondary schools across various districts of Tamil Nadu. By utilizing statistical tests and calculating the arithmetic mean, we found out that attendance has higher influence over the students' marks and their performance. This study also gave a result that the school in Trichy is the top-performing institution with respect to marks scored by the students. This can provide valuable insights to the factors influencing student achievement. Hence this research has the potential to inform educational practices and policies, ultimately leading to improved educational outcomes in the region. By enhancing attendance rates in the schools, we can duly recognize and celebrate exemplary attendance through enticing incentives, rewards, and recognition programs. Establishing a positive reinforcement system will effectively motivate and reinforce the habit of regular student attendance.

6. Future Scope

We conducted this research with 11th-grade students across four subjects, but it can be expanded to include more subjects and students from any grade level. The purpose of this study can be done to analyze the correlation between attendance and academic performance in laboratory sessions, specifically focusing on lab practical scores and grades from universities and colleges across various departments. Furthermore, this study can also be applied in industries to examine how irregular attendance affects the weekly or monthly target achievements of employees.

Expanding the scope of this research to include a wider range of subjects and students from different academic levels will enhance the validity and applicability of our findings. In the industrial context,

understanding the effects of irregular attendance on employee achievement is crucial for optimizing productivity and ensuring organizational success. By expanding the scope of this study and analyzing attendance patterns, we can gain insights that will inform strategies for improving student engagement and employee productivity.

References

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