



A Study of Student Academic Performance And Its Relation To Daily Habits.

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I. INTRODUCTION

In today's educational landscape, achieving academic success has become increasingly challenging for students, influenced by a variety of factors. These challenges may originate from changing study habits, the dynamics of teacher-student interaction, time management skills, the influence of social media, as well as the mental and physical well-being of students. Furthermore, disparities in access to educational resources contribute to these challenges, creating difficulties for students to excel academically.

The current global pandemic, COVID-19, has further worsened these challenges. Many students have faced interruptions in their learning environments, whether because of remote learning, coping with illness or family challenges, or experiencing economic hardships. As a result, students' ability to maintain focus, engage effectively with coursework, and manage their time has been significantly impacted.

Recognizing the complexity of factors influencing student academic performance, this study aims to explore and analyse the dynamics between various independent variables and student

academic performance. These independent variables comprise of:

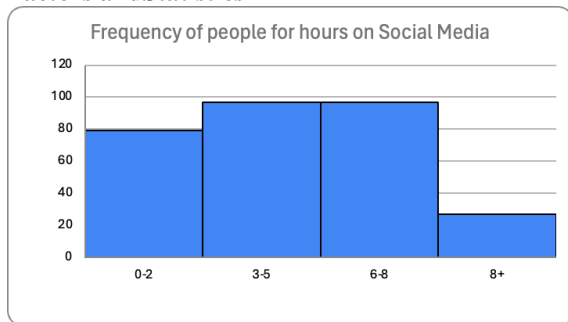
- Study Habits: The strategies and routines adopted by students to approach learning tasks and manage their academics.
- Teacher-Student Interaction: The quality of engagement and communication between teachers and students, which plays a pivotal role in facilitating effective learning experiences.
- Time Management: Students' ability to allocate time efficiently across academic tasks, extracurricular activities, and personal responsibilities.
- Social Media Usage: The extent to which students' engagement with social media platforms impacts their academic focus and productivity.
- Mental and Physical Health: The overall well-being of students, encompassing psychological strength, physical fitness, and stress management.
- Access to Resources: Differences in access to educational materials, technological tools, and support services, which can influence academic performance.

This research adopted descriptive and explanatory research design. It also employed the use of cross-sectional survey method using survey

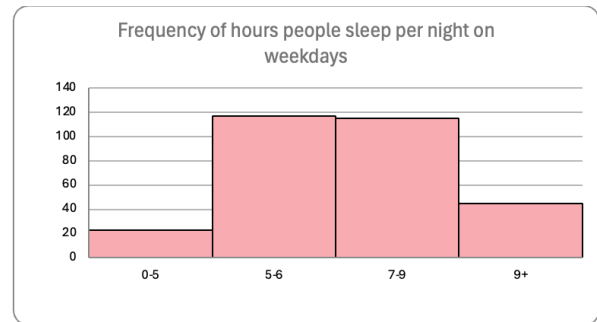


questionnaires that contains 4 items with a Likert Scale (1- being the lowest and 5- being the highest). The sample of 301 customers was selected using convenient sampling method to arrive at the desired conclusions. The data collected was analysed with the help of Spearman's Rank Correlation Coefficient, Regression Analysis, Ogive, Descriptive statistics, Anova and Histograms.

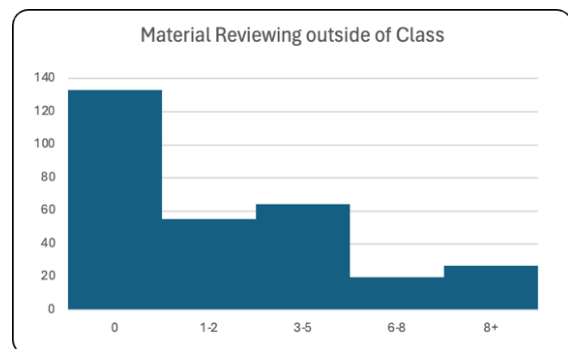
Factors and Statistics



Analysing the histogram of social media usage reveals trends in digital behaviour and its impact. The histogram segments usage into four-time frames: 0-2 hours, 3-5 hours, 6-8 hours, and 8 or more hours. Each interval provides insight into individuals' engagement with social media platforms and its evolving influence. Those spending 0-2 hours likely use social media minimally, maintaining a balanced approach to digital engagement. The 3-5-hour category represents a significant portion, reflecting social media's integration into daily routines for entertainment, communication, and information consumption. The 6-8-hour category suggests deeper immersion, possibly for work, entertainment, or social connection, raising concerns about potential negative impacts like reduced productivity and mental health issues. Finally, individuals spending 8 or more hours may exhibit excessive reliance on social media, potentially at the expense of real-world interactions and well-being. In essence, the histogram illustrates the increasing presence of social media in society, shaping behaviour and cultural discourse. Understanding these patterns is crucial for fostering responsible digital habits and mitigating potential adverse effects.



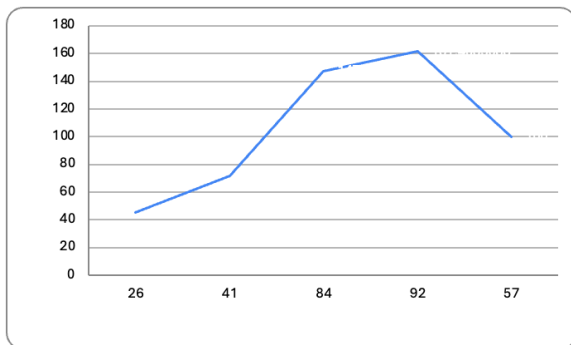
Examining the histogram detailing people's sleep hours per weekday reveals interesting insights into sleep patterns and their implications for health. The distribution categorizes sleep durations into four segments: 0-5 hours, 5-6 hours, 7-9 hours, and 9 or more hours. Each category paints a unique picture of sleep habits and their potential consequences. Individuals sleeping 0-5 hours may face challenges associated with insufficient rest, such as cognitive impairment and heightened health risks like obesity and cardiovascular disease. Those getting 5-6 hours of sleep daily teeter on the edge of recommended rest, potentially experiencing similar health impacts if sustained over time. The 7-9-hour category represents the optimal sleep range for most adults, correlating with improved cognitive function, mood, and overall well-being. Lastly, individuals sleeping 9 or more hours may either prioritize extended rest or have underlying health needs warranting additional sleep. In essence, the histogram illuminates diverse sleep patterns, underscoring the importance of adequate rest for overall health and productivity.



Analysing the histogram on hours spent reviewing material outside of class unveils varied study habits and academic commitment. The histogram categorizes review hours into five segments: 0 hours, 1-2 hours, 3-5 hours, 6-8 hours, and 8 or more hours. Each category offers insights



into students' dedication to independent learning. The largest group, those spending 0 hours outside class, may benefit from cultivating self-directed study habits to enhance academic performance. Moving to the 1–2-hour category, a significant portion engages in supplementary study, reflecting proactive learning. The 3–5-hour category shows a commitment to academic excellence, prioritizing deep understanding and retention of material. As hours increase beyond 5, the number of students decreases, suggesting a balance between study and other life aspects. In summary, the histogram emphasizes the importance of effective study strategies and self-regulated learning for academic success.



Score 1: Among the respondents, 26 individuals, comprising 45.61% cumulatively, reported the lowest satisfaction level with their academic performance. This suggests a significant portion of the sample is dissatisfied with their academic achievements, indicating potential areas for improvement or challenges faced in meeting their academic goals.

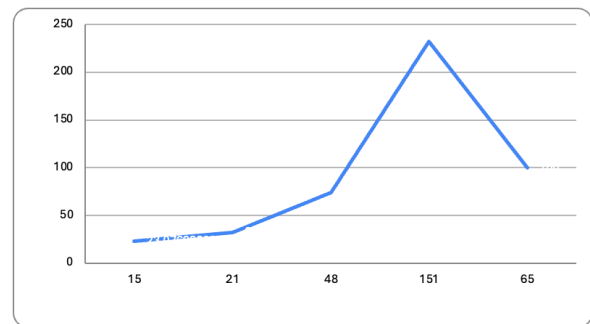
Score 2: The satisfaction level appears to increase as 41 respondents, accounting for 71.93% cumulatively, indicated a slight improvement compared to the previous bin. While still below the midpoint of the scale, this shift suggests a trend towards greater satisfaction or a perception of progress in academic performance among respondents.

Score 3: A notable increase in satisfaction is observed as 84 respondents, totalling 147.37% cumulatively, expressed moderate satisfaction with their academic performance. This jump signifies a significant portion of respondents feeling content with their achievements, possibly reflecting successful efforts in meeting academic expectations or goals.

Score 4: The trend of increasing satisfaction continues with 92 respondents, reaching 161.40%

cumulatively, indicating a high degree of contentment with their academic achievements. This suggests that a considerable majority of respondents are highly satisfied with their academic performance, possibly reflecting strong academic performance, recognition of personal growth, or achievement of academic goals.

Score 5: The highest level of satisfaction is reported by 57 respondents, representing 100% cumulatively, marking the culmination of the scale. This indicates that a significant proportion of respondents perceive their academic performance as excellent, achieving or even exceeding their academic expectations.



Score 1: Only 15 respondents, indicating 15 respondents, or 9.36% cumulatively, rated their overall physical health as the lowest possible on the scale. This suggests that a small proportion of the sample perceives their physical health as poor, indicating potential health concerns or challenges requiring attention.

Score 2: The number of respondents rating their physical health slightly increases to 21 individuals, representing 30 respondents or 18.63% cumulatively. While still relatively low, this indicates a slight improvement in perceived physical health compared to the previous bin.

Score 3: A significant increase in ratings is observed as 48 respondents, 48.45% cumulatively, rate their overall physical health as moderate. This suggests that a considerable portion of the sample perceives their physical health as average, with room for improvement but without significant health concerns.

Score 4: A substantial rise in ratings occurs as 151 respondents, reaching 229 respondents or 94.41% cumulatively, rate their physical health as good. This signifies that the majority of respondents perceive their physical health positively, indicating a high level of satisfaction with their overall well-being.



Score 5: The highest level of physical health rating is reported by 65 respondents, representing the entire sample or 100% cumulatively. This suggests that a significant proportion of respondents perceive their physical health as excellent, indicating robust health and well-being.

SPEARMAN'S RANK CORRELATION COEFFICIENT

In Statistics, Spearman's Rank Correlation Coefficient is a nonparametric measure of rank correlation (statistical dependence between the rankings of two variables). It assesses how well the relationship between two variables can be described using a monotonic function. Spearman's coefficient is appropriate for both continuous and discrete ordinal variables. Correlation is a form of dependency where a shift in one variable means a change is likely in the other, or that a certain known variables produce specific results. A positive correlation is a relationship between two variables in which both variables move in the same direction. Therefore, when one variable increases as the other variable increases or vice versa.

From our survey, we recorded the responses of 300 students regarding their academic performance and the various factors affecting it based on a scale from 1 to 5 (with 5 being the highest). With the help of the collected data, we computed the Spearman's Rank Correlation to assess the relationship between different factors such as the quality of teacher-student engagement, safety and supportiveness of the school environment, study habits, time management, mental and physical wellbeing, access to resources, social media usage etc.

A correlation coefficient of 0.465243551 indicates a moderate positive correlation between the quality of engagement between teachers and students and the safety and supportiveness of their school environment. This suggests that as the quality of engagement and communication increases, so does the perception of safety and supportiveness in the school environment, and vice versa. Essentially, when teachers and students communicate well and engage effectively, it tends to foster a sense of security and support within the school community.

A correlation of 0.525025402 suggests a moderately positive relationship between access to online educational resources and the effectiveness of time management skills. This means that as

access to online educational resources increases, the effectiveness of time management skills tends to increase as well, though it's not a perfect correlation. It implies that those who have better access to online educational resources may be more likely to develop and utilize effective time management strategies.

A correlation of 0.24441093 suggests a weak positive relationship between mental and physical health and the impact of extracurricular activities on academic performance. This means that there is some tendency for individuals with better mental and physical health to also perform slightly better academically when engaged in extracurricular activities. However, the correlation is relatively low, indicating that the relationship is not very strong. However, it's important to note that correlation does not imply causation, so other factors could also be at play.

Descriptive Statistics

Descriptive statistics are a set of methods used to summarize and describe the key features of a dataset. They provide a quick way to understand the basic characteristics of your data and give you a general idea of what it looks like.

Here are some key things descriptive statistics can tell you about your data:

Central tendency: This refers to the "middle" of your data and tells you where most of the values fall. Common measures of central tendency include the mean (average), median (middle value), and mode (most frequent value).

Dispersion: This describes how spread out your data is. Measures of dispersion include the range (difference between highest and lowest values), variance (average squared deviation from the mean), and standard deviation (square root of the variance).

Frequency distribution: This shows how often each value (or range of values) appears in your data. It can be visualized using histograms or frequency tables for categorical data.

By calculating these descriptive statistics, you can gain valuable insights into your data without going into complex analysis. Here are some benefits of using descriptive statistics:

Easy to understand: Descriptive statistics are relatively simple to calculate and interpret, even for those without a strong background in statistics.

Provides a quick overview: They can give you a quick summary of your data without requiring in-depth analysis.



Identifies patterns and trends: Descriptive statistics can help you identify patterns and trends in your data, which can be helpful for further analysis.

Lays the groundwork for further analysis: They often serve as the foundation for more complex statistical methods.

We used 2 questions from our survey to find descriptive statistics, the first being:

“On a scale of 1 to 5, do you feel pressure you from your peers to perform well academically? (1= no pressure, 5= high pressure)”

The descriptive statistics we found from the data collected is:

Descriptive Statistics	
Mean	3.03666667
Standard Error	0.06798556
Median	3
Mode	3
Standard Deviation	1.17754447
Sample Variance	1.386610925
Kurtosis	-0.728264287
Skewness	-0.133251365
Range	4
Minimum	1
Maximum	5
Sum	911
Count	300

Central tendency describes the middle or typical value of the data set. Here, the mean, median, and mode are all 3. This suggests that the data is symmetrical and most of the values are clustered around 3.

Dispersion describes how spread out the data is from the mean. Here, the standard deviation is 1.18 and the range is 4. This indicates that the data is somewhat spread out, but not extremely. There are values within 2 standard deviations of the mean for about 95% of the data points, and all the values fall within 4 units of the mean.

Here’s a more detailed breakdown of the table:
Mean: 3.04. This is the average of all the values in the data set.

Standard Error: 0.07. This is a measure of how much the sample mean might differ from the population mean, if we were to take many random samples of the same size.

Median: 3. This is the ‘middle’ value in the data set, when the data is ordered from least to greatest.

Mode: 3. This is the most frequent value in the data set.

Standard Deviation: 1.18. This is a measure of how spread out the data is from the mean.

Sample Variance: 1.39. This is the standard deviation squared. It’s another measure of how spread out the data is from the mean.

Kurtosis: -0.73. This statistic describes how much the tails of the distribution differ from a normal distribution. A negative value like this suggests that the tails are shorter, and the distribution is more peaked than a normal distribution.

Skewness: -0.13. This statistic describes how symmetrical the distribution is. A negative value here suggests that the distribution is slightly skewed to the right.

Our second question: “On a scale of 1 to 5, how safe and supported do you feel in your school environment?”

Descriptive Statistics	
Mean	3.583333333
Standard Error	0.063255835
Median	4
Mode	4
Standard Deviation	1.095623197
Sample Variance	1.20039019
Kurtosis	-0.052067901
Skewness	-0.820890355
Range	4
Minimum	1
Maximum	5
Sum	1075
Count	300

Descriptive Statistics:

Central tendency: The mean, median, and mode are all around 4. This suggests that the data is relatively symmetrical and that there are no extreme outliers.

Variability: The standard deviation is a little less than 1.10. This suggests that the data points are clustered fairly closely around the mean. The range is 4, which is the same as the difference between the minimum and maximum values. This also suggests that the data is not very spread out.

Shape: The skewness is negative, which suggests that the data is skewed to the left. This means that there are more data points than expected below the mean and fewer data points than expected above the mean.

Here are some additional things to consider:
The sample size is 300. This is a relatively large sample size, so we can be more confident that the statistics are representative of the population.

The kurtosis is negative, but very close to 0. Kurtosis is a measure of how peaked or flat a distribution is. A negative value suggests that the distribution is flatter than a normal distribution.

Overall, the data suggests that the variable being measured is relatively normally distributed with a slight skew to the left. The data points are clustered fairly closely around the mean, and there are no extreme outliers.



ANOVA

ANOVA, or Analysis of Variance, is a statistical technique used to compare means across two or more groups to determine if there are statistically significant differences between them. This method allows users to input their data, specify groupings, and generate an ANOVA table containing essential statistical values such as sum of squares, degrees of freedom, F-value, and p-value. These values provide insights into whether the observed differences among group means are likely due to actual differences or simply random variation.

The ANOVA analysis conducted on the survey data of 300 students provided valuable insights into the factors influencing academic performance. The significant findings revealed that there are notable differences among the factors studied, indicating that various aspects of student experiences contribute to academic outcomes. The between-groups variation, which represents the differences among the factors such as teacher-student engagement, school environment safety, study habits, and time management, was found to be statistically significant ($F = 12.39$, $p = 0.00046$). This result suggests that at least one of these factors significantly impacts academic performance. The magnitude of the F-value (12.39) exceeded the critical F-value (3.86), indicating strong evidence against the null hypothesis of no differences among the groups. Additionally, the within-groups variation, which accounts for individual differences within each factor, resulted in a mean square value of 1.40. This reflects the variability in academic performance that cannot be explained by the factors studied, highlighting the complexity of student outcomes. The total variation observed in academic performance was 854.37, indicating the overall spread of scores across the sample. These findings underscore the importance of considering a holistic approach to understanding academic outcomes and recognizing the interplay of various factors within the educational environment. By addressing multiple facets such as teacher-student engagement, school safety, and effective study habits, educators and policymakers can better support student success and foster environments conducive to learning and achievement.

CONCLUSION

This study investigated the complex interplay between various factors and student academic performance. A descriptive and explanatory research design was employed, utilizing a cross-sectional survey with a Likert

scale (1-5) and a sample of 301 students selected through convenient sampling. Data analysis included Spearman's Rank Correlation Coefficient, regression analysis, ogives, descriptive statistics, ANOVA, and histograms. By conducting our survey and analysing the data, we aimed to achieve the following objectives:

- How a range of different factors such as level of engagement and participation in class, access to online educational resources, how safe and supported they feel in the classroom, etc. affect students and their performance in the classroom.
- To provide insight into students' personal habits and their relation to their academic performance such as the amount of sleep they get per night, how much physical activity they partake in, etc.
- To understand how external factors affect students' academic performance such as pollution, support from family and quality of student – teacher engagement.
- A moderate positive correlation exists between the quality of teacher-student interaction and the perceived safety and supportiveness of the school environment (correlation coefficient = 0.465). Effective communication fosters a sense of security within the school community.
- Students with better access to online educational resources tend to demonstrate stronger timemanagement skills (correlation coefficient = 0.525).
- A weak positive correlation exists between mental and physical health and academic performance when engaging in extracurricular activities (correlation coefficient = 0.244). However, the correlation is weak, suggesting other factors may be at play.

The data on student satisfaction with academic performance indicated a generally positive trend, with a significant portion of respondents reporting moderate to high satisfaction. Physical health ratings were also positive, with the majority perceiving their well-being as good or excellent.

Overall, this study underscores the need for a holistic approach to education that addresses students' academic, social, emotional, and physical needs. By fostering positive teacher-student interactions, providing access to resources, and



promoting well-being, educational institutions can empower students to achieve academic success.

LIMITATIONS

This project makes use of a variety of statistical methods to analyse the data that was collected through the survey that we conducted such as:

1. Histograms
2. Spearman's Rank Correlation Coefficient
3. Ogive Curve
4. HISTOGRAM: A histogram is a graphical representation that organises a group of data points into user-specified ranges. Similar in appearance to a bar graph, the histogram condenses a data series into an easily interpreted visual by taking many data points and grouping them into logical ranges or bins.

The demerits of using a histogram are:

- Not allow you to read exact values because data is grouped into categories.
 - It can only be used with continuous data.
 - In Histogram, it is not easy to compare two data sets.
 - The use of intervals in the Histogram prevents the calculation of an exact measure of central tendency.
 - It depends (too much) on the number of bins.
 - It depends (too much) on variable's maximum and minimum.
 - It doesn't allow to discern continuous from discrete variables.
 - It makes it hard to compare distributions.
 - It's hard to make if you don't have all the data in memory.
2. OGIVE CURVE: An ogive curve, also known as a cumulative frequency curve, is a graphical representation of the cumulative distribution of data. It shows the probability that a variable will fall below a certain value.

Ogives are useful for:

- Identifying percentiles and quartiles in the data set.
- Comparing the distribution of two or more data sets.
- Estimating the proportion of data points that fall within a specific range.

However, ogive curves also have limitations:

- They can be difficult to interpret for those unfamiliar with them.

- They can be less visually appealing than other chart types, such as bar charts.
- They are not suitable for displaying data with a small number of categories.

3. SPEARMAN'S RANK CORRELATION COEFFICIENT: In Statistics, Spearman's Rank Correlation Coefficient is a nonparametric measure of rank correlation (statistical dependence between the rankings of two variables). It assesses how well the relationship between two variables can be described using a monotonic function. Spearman's coefficient is appropriate for both continuous and discrete ordinal variables.

The demerits of using Spearman's Rank Correlation Coefficient are:

- For large samples, it is not a convenient method.
- Combined 'R' of different series cannot be obtained as in case of mean and S.D.
- Can be difficult to work out.
- It is only an estimate measure as actual values are not used for calculations.
- Quite a complicated formula
- Only non-linear data can be computed.
- Regression cannot be computed.
- When data has higher values, it is difficult to compute.
- Can be misinterpreted.
- Need two sets of variable data so the test can be performed.

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