



"Analysing The Effect Of Mobile Phone Using Stress In Academic Performance Of Students: Mathematical Outlook"

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ABSTRACT

This study investigates the correlation between mobile phone usage and academic performance among students. Utilizing statistical methods and mathematical models, it analyses data to determine how mobile phone usage affects students' grades and overall academic achievement. There is increasing concern about the potential benefits and drawbacks of cell phone use for academic performance. This study investigates the connection between academic success and student's use of mobile phones. Utilizing statistical methods and mathematical models, it examines data to determine how mobile phone use affects student's grades and overall academic achievement. Presentation of the basic statistics of the data collected (e.g., mean, median, standard deviation).. Graduate students who were chosen at random participated in a survey based study.(N = 190) including 100 girls and 90 males in the 17-24 age range. Students from variety of courses, including B.Sc(18),B.Com(60),B.A (36) BCA(61) and BBA(15) were chosen for this study. In this investigation, the mobile scale was used to evaluate the behavioral changes based on self-reports, and dependence was students to assess the dependence on mobile phones. Results of the Chi-Square and Anova analysis between stress 92.27% effect in usage mobile phone and academic performance

Keywords: Technology, gaming, mental health, mobile phones, and academic performance, affective engagement, mathematical with technology, behavioral engagement, and negative attitude.

INTRODUCTION

Recent years have seen a great deal of change in the educational scene, mostly due to developments in computer and communication technology. The increasing use of mobile technology for learning has complimented traditional classroom settings, where direct student-teacher interaction was essential. Over the past few decades, as the globe has gotten more mobile, mobile phones have transformed from being communication tools to becoming essential technology tools used by individuals globally, regardless of age. Due to its extraordinary success, mobile technology has become widely accepted as user-friendly technology with a wide range of uses that people may take advantage of. This has led to the emergence of a wide range of mobile applications that serve many purposes, including education.

PROBLEM DEFINITIONS

Students everywhere have grown more reliant on their cell phones during the past few years. The pandemic crisis has forced many college to switch to an online format. Students' use of mobile devices affects how much time they spend on them and how that affects their academic achievement. Thus, the impact of mobile usage on academia is examined in this research

LITERATURE REVIEW

One of the greatest technological gifts of the twenty-first century, mobile phones are especially well-liked by teenagers, according to Yadav's (2021) research. These days, mobile phones come with an endless amount of resources that may be applied to a wide range of tasks. Excessive use can cause behavioural changes in adolescents as well as poorer academic achievement. The aim of this research is to examine the relationship between teenage academic success, mobile phone use, and behavioural modifications.

In her research, Anjali (2021) discovered that the use of mobile phones significantly affects the academic performance of senior secondary school students. Age differences, gender, and socioeconomic status did not significantly affect the academic performance of senior secondary school students. Lastly, mobile phone use did not significantly affect the academic performance of senior secondary school students.

In his research, Mukhdoomi (2020) discovered that smartphone addiction is resurrecting from its youth-like levels due to an over-reliance on technology in all spheres of life. Therefore, in order to ascertain if smartphone addiction is advantageous to students or detrimental to their academic performance, extensive and consistent study must be done. Future scholars have studied this topic on a range of demographics and found that there are both good and negative relationships between smartphone addiction and academic achievement.

According to Hossain's (2019) research, with the rapid advancement of mobile phone technology, there seems to be potential for the device to enhance students' academic performance. For example, modern "smartphones" provide students with rapid, portable access to many of the same capabilities that improve education as an Internet-connected computer, including file sharing, online information retrieval, and communicating with teachers and fellow students. Since most respondents utilized their phones for study

purposes, it is clear that a cell phone is a necessary study aid. The study demonstrates that mobile phones are one of the most often utilized information access devices due to its interactive, multi-user features, which can occasionally be helpful or disturbing during research.

Objectives

- The amount of mobile phone use and its influence on graduate students' academic performance and behaviour are the subjects of a study.
- The objective is to ascertain the extent to which students utilize their phones on a daily basis.

RESEARCH METHODOLOGY

A survey of 190 graduates from various college was conducted in accordance with the needs of the current issue. Young people about to attend college were surveyed to learn more about how using and how mobile phones affected their academic performance.

DATA ANALYSIS AND INTERPRETATION

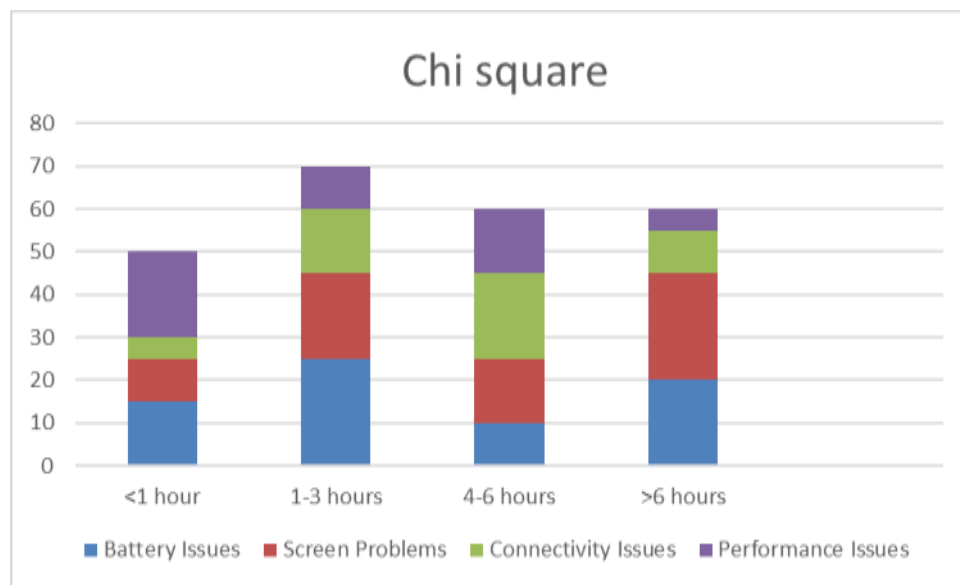
- Chi square
- Two-way Anova

The Chi-Square Test is a statistical method used to determine whether there's a significant association between unqualified variables. Examine if there's a important relationship between the period of mobile phone usage and the problems faced with mobile phones. Here's a step-by-step guide on how you can conduct this test:

Step 1: Collect and Organize Data

1. **Categorize Data:**
 - **Duration of Mobile Phone Usage:** Create categories based on usage duration, such as "Less than 1 hour," "1-3 hours," "4-6 hours," "More than 6 hours."
 - **Problems Faced:** Identify and categorize the problems users face, such as "Battery Issues," "Screen Problems," "Connectivity Issues," "Performance Issues," etc.
2. **Create a Contingency Table:** Construct a table that cross-tabulates the two categorical variables. For example:

Problems \ Usage Duration	<1 hour	1-3 hours	4-6 hours	>6 hours
Battery Issues	15	25	10	20
Screen Problems	10	20	15	25
Connectivity Issues	5	15	20	10
Performance Issues	20	10	15	5



Step 2: Calculate Expected Frequencies

1. **Compute Totals:** Find the total count for each row, column, and overall total.
2. **Calculate Expected Frequencies:** Use the formula for expected frequency for each cell:

$$\text{Expected Frequency} = \frac{(\text{Row Total} \times \text{Column Total})}{\text{GrandTotal}}$$

Step 3: Compute Chi-Square Statistic

1. **Chi-Square Formula:** Use the formula:

$$\chi^2 = \sum (O_{ij} - E_{ij})^2 / E_{ij}$$

where O_{ij} is the observed frequency, and E_{ij} is the expected frequency for each cell.

2. **Sum:** Add the values obtained from each cell to get the Chi-Square statistic.

Step 4: Determine Degrees of Freedom

1. **Degrees of Freedom:** Calculate the degrees of freedom using: $df = (r-1) \times (c-1)$ where r is the number of rows and c is the number of columns.

Step 5: Compare with Chi-Square Distribution

1. **Find the Critical Value:** Use the Chi-Square distribution table to find the critical value at a chosen significance level (e.g., 0.05) with the calculated degrees of freedom.
2. **Decision:** Compare your computed Chi-Square statistic with the critical value from the Chi-Square distribution table.

- If $\chi^2 > \text{critical value}$, reject the null hypothesis (suggesting a significant relationship).
- If $\chi^2 \leq \text{critical value}$, do not reject the null hypothesis (suggesting no significant relationship).

Example Calculation

Assume you have the following data:

Problems \ Usage Duration	<1 hour	1-3 hours	4-6 hours	>6 hours
Battery Issues	15	25	10	20
Screen Problems	10	20	15	25
Connectivity Issues	5	15	20	10
Performance Issues	20	10	15	5

Results Interpretation:

- If the p-value is **less than 0.05**, it suggests a significant association between stress and mobile phone usage.
- If the p-value is **greater than 0.05**, there is no significant association.

ANOVA (Analysis of Variance) test

The ANOVA (Analysis of Variance) test can be used to compare the means of three or more groups and determine whether there is a statistically significant difference between them.

In this case, an ANOVA can be used to investigate if variable levels of cell phone use are associated with different levels of stress in the classroom.

Step 1: Describe Your Theories

Null Hypothesis (H0): There is no discernible variation in stress levels between the various mobile phone usage groups.

Alternative Hypothesis (H1): The stress levels of various mobile phone usage groups differ significantly from one another.

Step 2: Gather and Arrange Your Information

The categories of mobile phone usage (e.g., Low Usage, Moderate Usage, High Usage) are an independent variable.

Dependent Variable: Stress in the classroom, which could be assessed via a stress scale (such as survey results).

Step 3: Verify the ANOVA Assumptions

Make sure your data satisfies the following presumptions before performing an ANOVA:

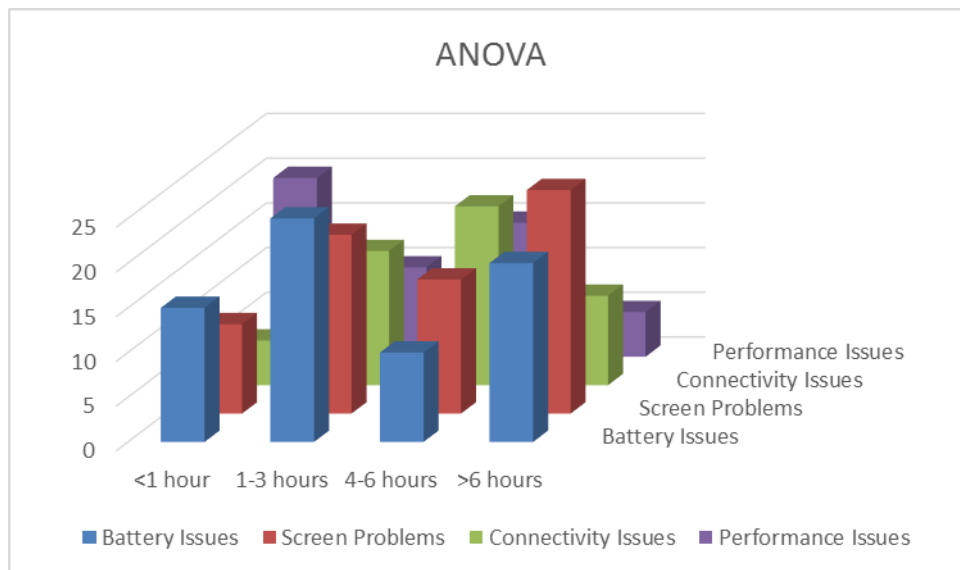
Independence of observations: Every participant should fall under a single mobile phone usage category.

Normality: Within each group, the stress scores ought to be roughly distributed regularly.

Homogeneity of variation: The stress score variance need to be comparable between the various mobile phone usage groups.

Step Four: Run the ANOVA test.

The ANOVA test manually by following these procedures, or you can use statistical software.



- **Purpose:** ANOVA is used to compare means among three or more groups to see if at least one group mean is statistically different from the others.
- **Application:** ANOVA would be appropriate if you're comparing academic performance across different levels of stress or mobile phone usage (e.g., low, medium, high).
- **Results Interpretation:**
 If the p-value is **less than 0.05**, it suggests that there is a significant difference in academic performance between the groups.
 If the p-value is **greater than 0.05**, it indicates no significant difference in academic performance between the groups.

Testing of Hypothesis

Hypothesis H0:-Students' performance was affected by their use of mobile phones

1. Do you use your Mobile Phone during classes?
2. How often do you check your Mobile Phone?
3. How much time in a day do you spend on this device?
4. Do you think that the continuous use of Mobile phone distracts you from your studies?
5. 'Mobile phone is a necessity or status symbol', what do you think?
6. On a scale of 1 to 5, how often do you feel stressed about your academic
7. What are the main sources of your academic stress?

8. How often do you experience physical symptoms of stress (e.g., headaches, fatigue, and muscle tension) due to academic pressures?
9. How frequently do you share your mobile number with classmates or college-related contacts?
10. Have you encountered any negative experiences related to sharing your mobile number in college?

CONCLUSION

According to the study's findings, learning settings facilitated by mobile technology allowed for statistically significant gains in students' academic performance and motivation. There was a statistically significant difference in the motivation sub-dimensions between the experimental and control groups in terms of self-efficacy, learning belief, external goal orientation, and subject value. The sub-dimensions measuring internal goal orientation and test anxiety, however, did not significantly differ from one another. Based on the findings from the interviews, the students reported that the application is engaging, enjoyable, helps with cooperative learning, and makes learning easier. Conversely, a few pupils communicated the health issues they had when utilizing the tablets. An online survey was used to gather data from graduate students who were selected at random. (N=190), comprising 90 men and 100 girls between the ages of 17 and 25. For this study, students were selected from a range of courses, including B.Sc.(18), BCom.(60), B.A.(36), BCA.(61), and BBA. (15). The mobile scale was utilized in this study to gauge self-report behavioral changes, and dependence usage of mobile phone stress 92.27% was used to gauge dependence on mobile phones. Findings from the Chi-Square study comparing academic achievement and cell phone use. ANOVA test model insights to ascertain the kind and degree of the association between mobile phone use and academic achievement.

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