
UTM

UNIVERSITI TEKNOLOGI MALAYSIA

**Faculty of Computing**

# PROJECT 1

## SCST1223-PROBABILITY AND STATISTICAL DATA ANALYSIS

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**Section: 02**

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# Introduction

The rapid shift to online learning during the Covid-19 pandemic created a unique opportunity to examine the internet's role in education. As students who experienced this transition firsthand, our group noticed significant variations in how individuals adapted—some excelled in the digital environment, while others faced challenges with engagement, accessibility, or technical barriers. These observations led us to explore a key question: *How was the internet utilized for learning during this period, and what patterns emerge from this unprecedented experiment in remote education?*

This study aims to investigate these dynamics through descriptive statistical analysis, focusing on how frequently and in what ways learners relied on online tools. By collecting survey responses from at least 60 participants, we will identify trends in internet usage, preferred platforms, and common challenges. Using R for data analysis, we will present our findings through frequency distributions, bar charts, and measures of central tendency, providing a clear overview of the digital learning landscape during the pandemic.

Beyond quantifying these trends, our research seeks to inform future educational strategies—whether for fully online, hybrid, or tech-enhanced traditional classrooms. By understanding what worked (and what didn't) during this critical period, we hope to contribute meaningful insights into the evolving relationship between education and technology.

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# Data Collection

This section details the process undertaken to collect data on the use of the internet in learning during the Covid-19 pandemic, adhering to the project's requirement of a minimum sample size of 60 and the use of a questionnaire.

***Questionnaire Design:***

The questionnaire utilized in this study comprised a series of questions designed to gather quantitative data suitable for descriptive statistical analysis. The questions focused on key aspects of internet use in the learning experience during the pandemic, including:

- Demographics: To provide context for the analysis, the questionnaire collected data on Gender and Age of the respondents, as well as their Major field of study. These variables allow for potential exploration of internet use patterns across different demographic and academic groups.
- Extent of Platform Usage: Respondents indicated the number of different online platforms they used for learning purposes. This resulted in a numerical variable, "Number of platforms used."
- Reliance on Internet for Learning Tasks: Participants estimated the percentage of their learning tasks that were dependent on internet access, yielding a numerical variable, "Internet dependent tasks."
- Time Allocation for Study: Respondents reported the average number of hours they dedicated to studying on a daily basis, resulting in the numerical variable, "Daily study hours."
- Perceived Helpfulness of the Internet: The helpfulness of the internet for learning was assessed using a 5-point Likert scale (1 = Not helpful, 5 = Very helpful), resulting in the ordinal variable, "Internet helpfulness (1-5)."
- Engagement in Online Courses: Respondents indicated the number of online courses they were actively engaged in on a daily basis, resulting in the numerical variable, "Daily online course."
- Stress Levels Related to Online Learning: The level of stress experienced due to online learning was measured using a 5-point Likert scale (1 = Not stressfull, 5 = Extremely stressfull), resulting in the ordinal variable, "Online learning stress (1-5)."

***Data Collection Procedure:***

The questionnaire was distributed online using Google Forms and shared via social media. The target participants were individuals who were engaged in learning at any level during the Covid-19 pandemic.

Participation was voluntary and anonymous to ensure honest responses.

***Sample Size:***

As evidenced by the collected data, a total of 49 responses were obtained. The analysis presented in this report will be based on these 49 responses.

***Variables Measured:***

The data collected and available for analysis includes the following key variables:

- Timestamp (Nominal) - Records when the response was submitted.
- Gender (Nominal) - Respondent's gender.
- Age (Interval) - Respondent's age in years.
- Major (Nominal) - Respondent's field of study.
- Number of platforms used (Ratio)
- Internet dependent tasks (Ratio)
- Daily study hours (Ratio)
- Internet helpfulness (Ordinal - Scale of 1 to 5)
- Daily online course (Ratiol)
- Online learning stress (Ordinal - Scale of 1 to 5)

These variables will be analyzed using descriptive statistical methods in R to summarize the central tendencies, dispersion, and distributions of the respondents' experiences with internet-based learning during the Covid-19 pandemic, potentially considering differences based on demographics and academic backgrounds.

# Data Analysis

***Categorical data:***

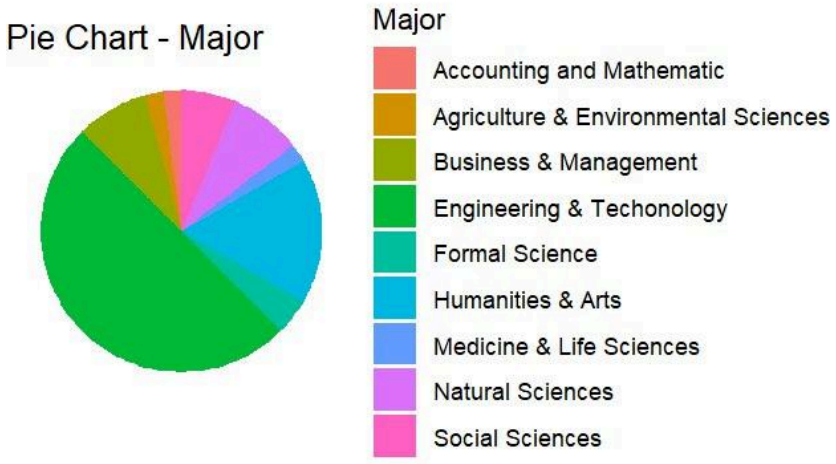


**Figure 1: Pie Chart of Major**

in terms of pie chart, the respondents' preferred subject of study was Engineering & Technology, followed very closely by Business & Management and Humanities & Arts. That is to say that the sample population was over-dominance with STEM students who would clearly be well acquainted with computer tools. That may or may not have implications on students' overall adaptability to the practice of studying online in relation to other courses.

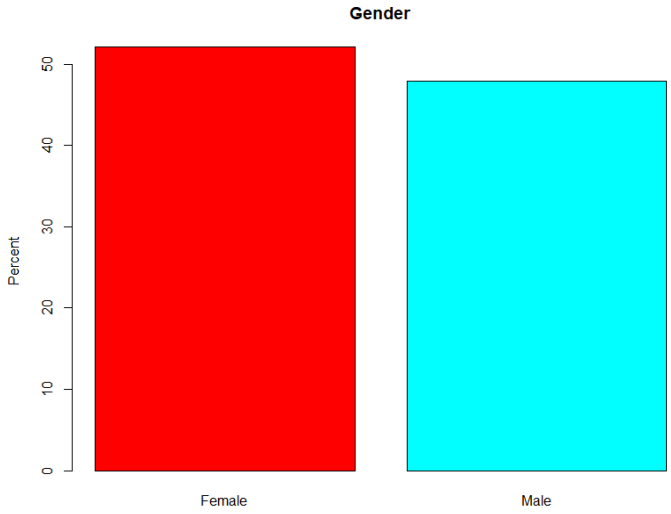


**Figure 2: Bar Chart of Gender**

Since 52.1% of the participants are women and 47.9% are men, the gender makeup of the sample is almost even. Because of this balance, the outcomes will be less likely to lean towards either sex, making the findings more applicable to all students.

***Quantitative data::***

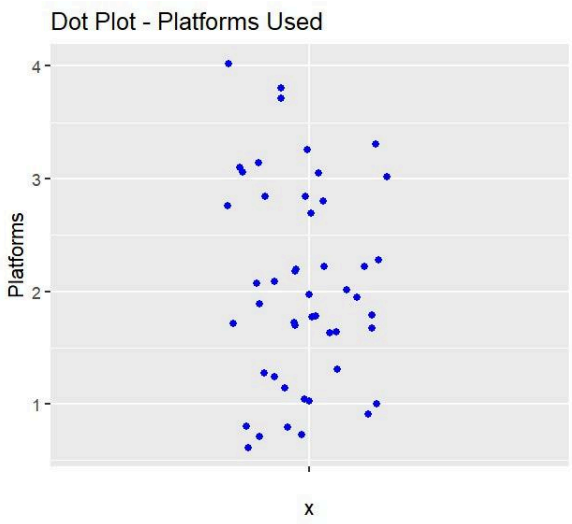


**Figure 3: Dot Plot of Platforms Used**

Few students used four online learning platforms, and most used only one or three. This suggests that the students opted to remain with a few known platforms even though there were many tools available, either because they were easier to use or because there was institutional favoritism.

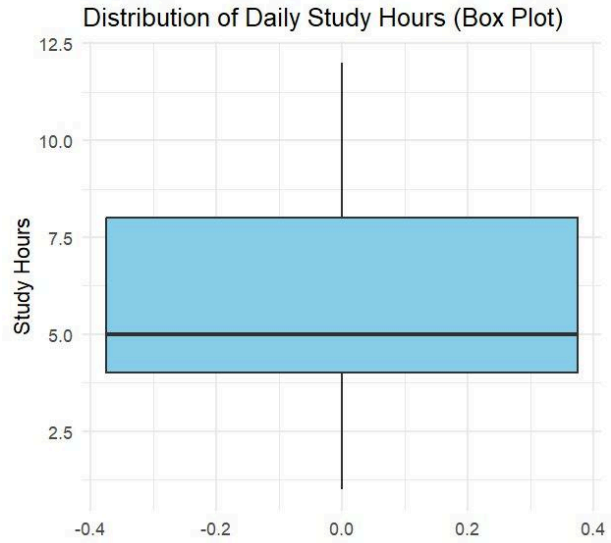


**Figure 4: Box Plot of Daily Study Hours**

At a maximum of 12.5 hours in some extreme outliers, the box plot shows the median study time per day to be 5–7.5 hours. This shows the large amount of time spent on distance learning as students endure with tremendously heavy loads or ineffectiveness from distance learning.

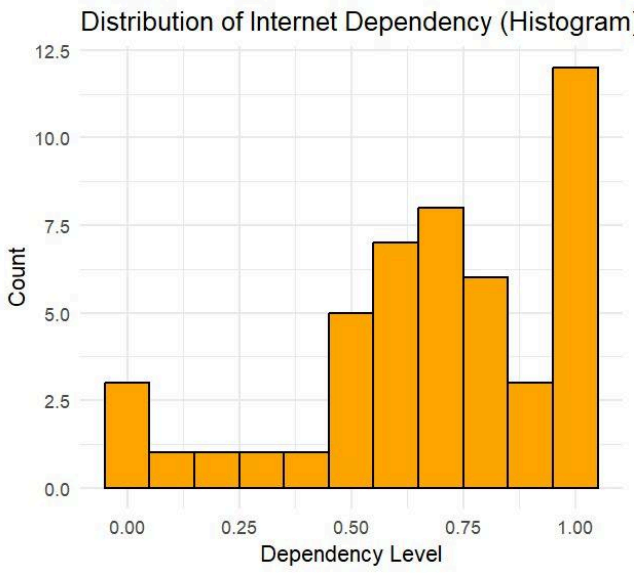


**Figure 5: Histogram of Internet Dependency**

Widespread use of digital resources during the pandemic was evident as most students reported using the Internet 60–100% of the time for their work. Because so few students are able to finish school outside the Internet, it indicates the prominence that internet resources have attained.

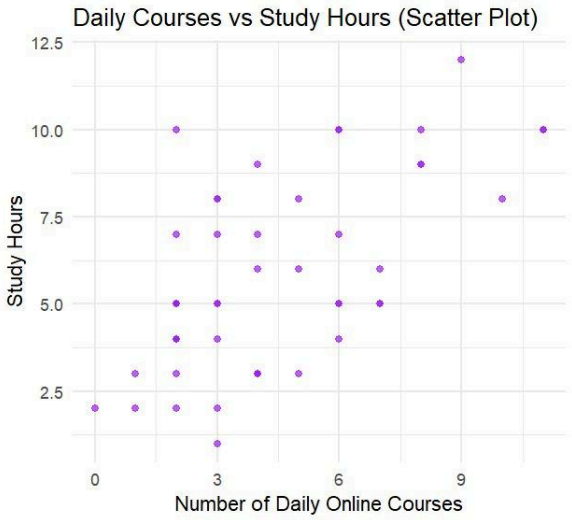


**Figure 6: Scatter Plot of Daily Courses vs Study Hours**

Though there was no visible linear correlation, students who took more classes in a day (about 6) would likely study for longer periods (up to 10 hours). This indicates that though study time was influenced by course load, time commitment was influenced by other factors such as self-paced learning or difficulty of assignments.

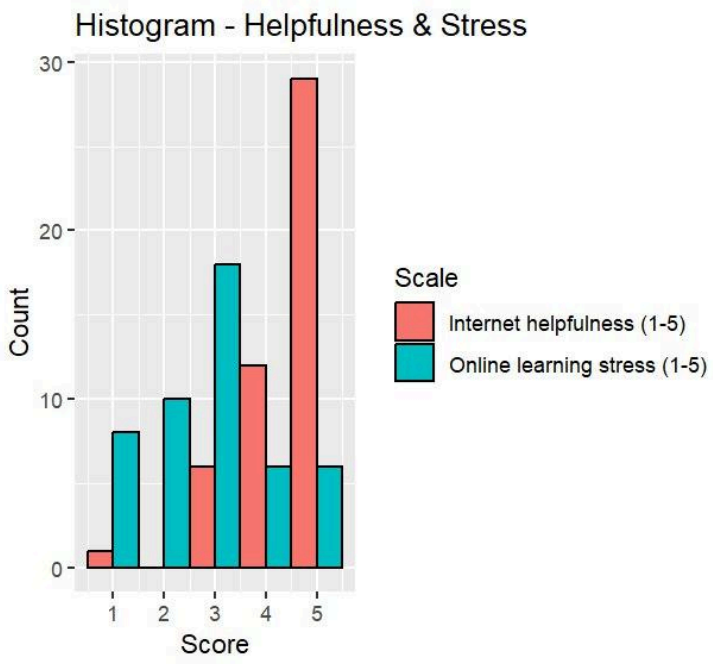


**Figure 7: Histogram of Helpfulness & Stress**

Strong support for online learning content is reflected in the highest rating of (5) for the convenience of the internet. Stress, however, was bimodal, with students clustering at the high (4-5) and low (1-2) ends. This division shows that although many students were stressed, most found learning convenient, which indicates that people have varying degrees of adaptability.

# Conclusion

This report is based on the survey conducted among 60 pupils. Students, especially those in engineering and technology, significantly relied on the Internet—some reported that 60% to 100% of their assignments were completed online. On the whole, students reported spending five to ten hours a day learning online. Stress levels were different and some learners deemed online learning to be very stressful, even though the Internet was considered useful.

We assessed both categorical and quantitative data using R programming and emphasized trends through bar chart and histogram visualizations. The research had some comments regarding the Internet's usefulness in teaching during the pandemic, but also highlighted issues of stress and different levels of discipline-specific adaptability. More focus is needed for the longitudinal impacts and for developing effective strategies to improve online education.