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MA260 - Statistical Analysis 1

Assignment 4 “Mini-Study Part 1”

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**Mini-Study Part 1**

**Question 1**

The topic selected for this mini-study is “The relationship between GPA scored by students and the hours spent on social media platforms such as Instagram, Facebook, and Twitter."

The research question will seek to determine whether there exists a relationship between the hours spent on social media by students and their performance in school.

**Question 2**

Population refers to individuals chosen for the study to provide samples for successful research. The target population for this mini-study will be students from ST. Lauren high school.

**Question 3**

**The student's GPA scored in their last test**: Since our study focuses on the relationship between hours spent on social media and GPA attained by students, this will be a fundamental question for our research to gather data that can be used during analysis.

**Approximate hours spent on social media**: As stated before, our study focuses on the relationship between GPA and hours spent on social media, and therefore, this is another essential question to ask.

**Social media they prefer:** it is essential to know the social media platforms the students spend most of their time on because it could positively or negatively affect their GPA since some are more informative than others.

**Age of the student:** we will note the generations of the students and the hours they spend on social media, and consequently, the effect it has on their GPA.

**Question 4**

|  |  |
| --- | --- |
| **Variable** | **Type** |
| GPA | Discrete |
| Hours spent on social media | Discrete |
| Age | Discrete |
| Gender | Nominal |
| Social media preferred | Categorical |

**Question 5**

Since our target population is high school students, we can post the study to the school's website and the information board. Use of questionnaires and surveys will be used to teach the students. The study can also be posted in social media groups where the students are, such as Facebook and Whatsapp groups.

**Question 6**

We will collect our data using questionnaires, surveys, Google forms, and polls.

**Question 7**

We can use the stratified sampling method. This method is used based on criteria such as age and gender (Hankin et al., 2019). We can also calculate the number of people sampled from each group.

We can also use a simple random sampling method. This method is based on chance, where every student has an equal opportunity to be selected (Arnab, 2017). They are chosen randomly, and they all have equal probabilities of being selected.

**Question 8**

Scatter plots. 2D or 3D plots are most appropriate for our data as they show the standard variation of two or three variables from our group (Rahlf, 2017). We can use two variables or three, such as age, GPA, and hours spent, and generate our plot.

Pie charts and bar graphs. These are used to show the proper representation of categorical data and also clearly see the contribution of each individual or group.

**Question 9**

**Mean:** mean will find the average GPA of the students and the average hours spent on social media.

**Median:** median will be used to find the midpoint of GPA.

**Dispersion:** dispersion shows the spread of data values and the effect of outliers.

**Range:** we can find the range of hours spent on social media and the range of GPA.

**Standard deviation:** standard deviation will be used to check the variation of our results from the mean.

**Correlation coefficient:** the relationship between hours spent on social media and GPA can be established, and the correlation and strength of correlation established.

**Quartiles:** quartiles can be used to check the position of different variables.

**References**

Arnab, R. (2017). Simple random sampling. *Survey Sampling Theory and Applications*, 51–88. https://doi.org/10.1016/b978-0-12-811848-1.00003-0

Hankin, D. G., Mohr, M. S., & Newman, K. B. (2019). Stratified sampling. *Sampling Theory*, 68–91. https://doi.org/10.1093/oso/9780198815792.003.0005

Rahlf, T. (2017). Scatter plots. *Data Visualisation with R*, 281–304. https://doi.org/10.1007/978-3-319-49751-8\_9