Measuring the Effectiveness of Online Learning Resources

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This document’s purpose is to study and determine the proportions of usage in online learning resources and their effectiveness in university students, as well as the difference between online or in-person, engagement study or self-study, and other aspects that are being performed by students using online learning resources.

### Proposal of the Project:

The project will collect responses from STA304H5 Fall 2023 students regarding their usage of online learning resources. We will use statistical analyses to draw conclusions about whether or not students are benefiting from online learning resources, and if so, which ones specifically. While the sample may not be an accurate representation to apply to the population, we assume the questionnaire is generalized enough to apply to all students.

**Target Population:**

STA304H5 Fall 2023 students.

### Sampling Proportion:

We will estimate the proportion of students who were satisfied with the online learning resources and felt that these resources helped them better understand the course content.

**Sampling Mean:**

We will use a numerical scale (similar to a Likert scale) to collect student perceptions of the effectiveness of online learning resources and the frequency of student use of online learning resources. We will estimate the mean of these data

### Sampling Frame:

STA304H5 F 2023 LEC0101 & LEC0102 (in their corresponding rooms), as well as tutorial sections (in their corresponding rooms).

### Sample Size:

50

### Sample Method:

We will use SRS since our population is mostly homogenous. We will post our questionnaire onto piazza, as well as randomly survey each tutorial and lecture section. This will ensure *n* random participants who decide to complete our survey have an equal chance out of the *N* population.

### Data Collection Methodology:

Questionnaire: [Google Forms](https://docs.google.com/forms/d/e/1FAIpQLSdAcOCCQAM7hwsrq1cRtnJNIFhuiPxPamew5glROeMqbDph3A/viewform?usp=sharing)

### Possible Hypotheses:

* Online resources usage correlates with higher academic performance satisfaction.
* When given “Professor Edited” online learning resources such as annotated notes and recorded lectures, students' satisfaction for academic performance improves.
* Students that use Online Learning Resources (despite Self-study or Engagement-study), have higher satisfaction of academic performance then students who partake in exclusively Engagement-study.
* Those who pre-study with online learning resources, or review with online learning resources have higher satisfaction for academic performance.

### Use of advance methodologies:

Multiple Regression Analysis, Factor Analysis, Cluster Analysis, Logistic Regression

Use of Multinomial Generalized Estimating Equations. In our case, we're conducting a survey to measure the effectiveness of online resources and our outcome variable has more than two categories, MGEE may be a relevant statistical approach.

Since we are asking participants based on a numerical scale, we have as many categorical variables as numbers presented in the questionnaire as options.