Learning Gap

during COVID-19 Pandemic

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INTRODUCTION

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Background Info

COVID-19 forced an immediate transition from in person lectures to online learning back in 2019.

2

Motivation

Getting the result is a first step towards helping us to discover how to transition back to in person learning.

3

Question of Interest

Is there a gap in the learning experience for students when it comes to online versus in person learning?

4

Hypothesis

There is a learning gap of students between pre/post and during pandemic.

1

Sampling

ABOUT SAMPLING

Data Collection

Surveys are randomly distributed during lectures and tutorials.

SRS

Each individual has an equal chance to be chosen.

Represent the population with less bias.

Logistic Reg

Predictive analysis between nominal, ordinal, discrete and continuous variables.

Odds Ratio

The ratio between given an event A and missing B, and given an event B and missing A.

We have successfully collected

57

valid samples with B (margin of error) = 11% to estimate the proportion of population

2

Methodologies

2.1 Linear Regression

LINEAR REGRESSION

X - Explanatory Variable
Average Frequency of Skipping In-Person Lectures

Y - Response Variable
Average Frequency of Skipping Online Lectures

- **Slope or $\hat{\beta}_1 = 0.57$**

  On average, the student skips 43% less in-person lectures than online lectures.

- **H0: $\beta_1 = 0$ vs Ha: $\beta_1 \neq 0$**

  To test if there is a linear correlation between X and Y.

- **P-Value = 3.695×10^{-6}**

  Reject H0 since P-Value < Alpha.

  Hence, β_1 does not equal to 0 and there is a correlation.

HYPOTHESIS TESTING

Hypothesis Testing of Mean

$$\textbf{H0: } \mu_1 - \mu_2 = 0 \quad \textbf{vs} \quad \textbf{Ha: } \mu_1 - \mu_2 \neq 0$$

Null Hypothesis:
The mean of average frequency of skipping online lectures and in-person lectures are the same.

Alternative Hypothesis:
Two averages are different.

RESULTS OF HYPOTHESIS TESTING

Use $\alpha = 0.05$.

- **T-statistics** = 2.0196 with df = 60
- **P-value** = 0.0479
- **CI** = (0.0048, 0.9985)

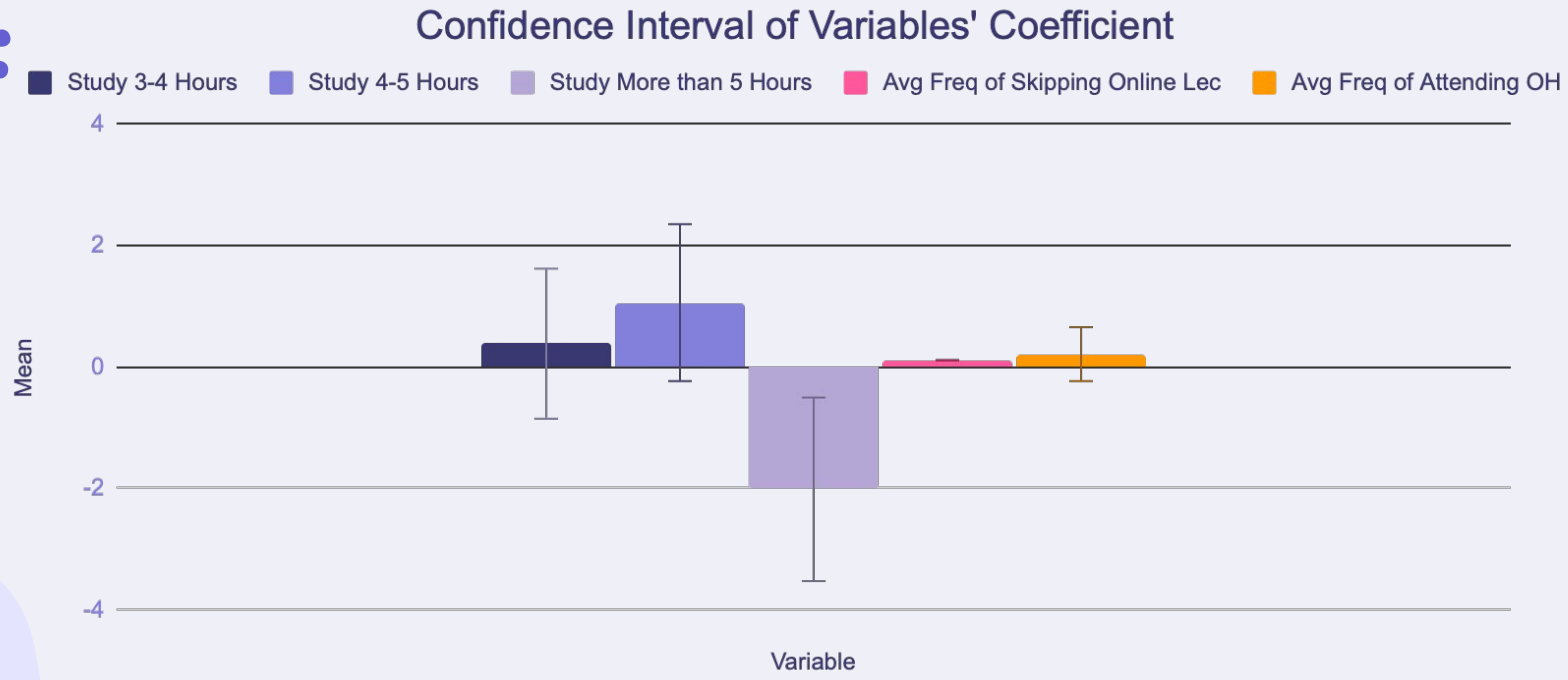
Since p-value is smaller than the alpha level, so we fail to reject the null hypothesis.

Hence, we conclude that the ***average frequencies of skipping online lectures and in-person lectures are similar.***

2.2 Logistic Regression

Analysis for Pandemic Era

ORDINAL LOGISTIC REGRESSION



ODDS RATIO

1.146

2-4 Hours

The odds of being more likely to increase in cGPA is 1.146 times more than the ones who do not study for 2-4 hours.

2.86

4-5 Hours

The odds of being more likely to increase in cGPA is 2.86 times more than the ones who do not study for 4-5 hours.

0.132

More than 5 Hours

The odds of being more likely to increase in cGPA is 86.75% times lower than the ones who do not study more than 5 hours.

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Limitations & Conclusion

Limitations

Limitations include but is not limited to:

- Small sample size:
  - Processing data got rid of some invalid responses
- Not offering prize might cause students to not fill out the survey as carefully
- Population (STA304) does not reflect students in general

Conclusion

- No significant learning gaps for students before and during pandemic
- However, one should not base the truth based on this one study

  Further testing should be conducted with larger sample size and more repetition

THANKS!

By All STA304 Group 2 Members

Does anyone have any questions?