Hypothesis Analysis on e-learning satisfaction among undergraduates under pandemic situation

CS5651 – Statistical Inference

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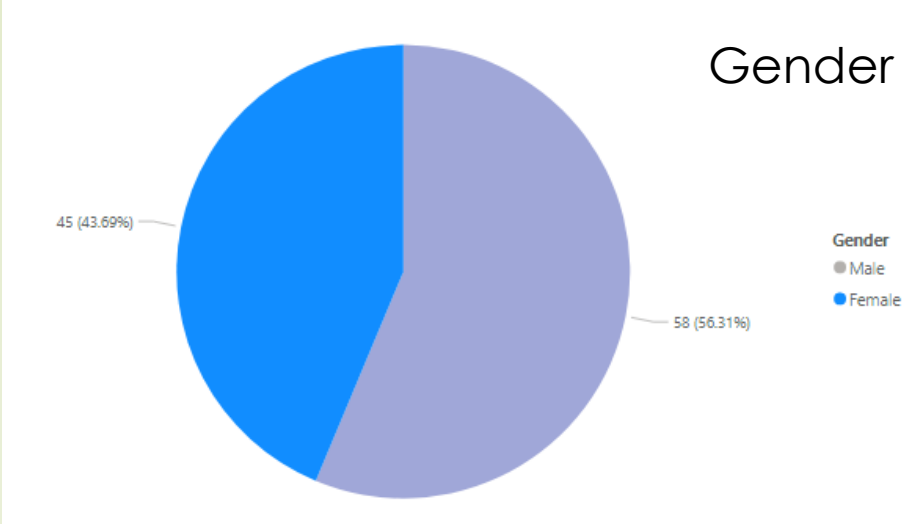
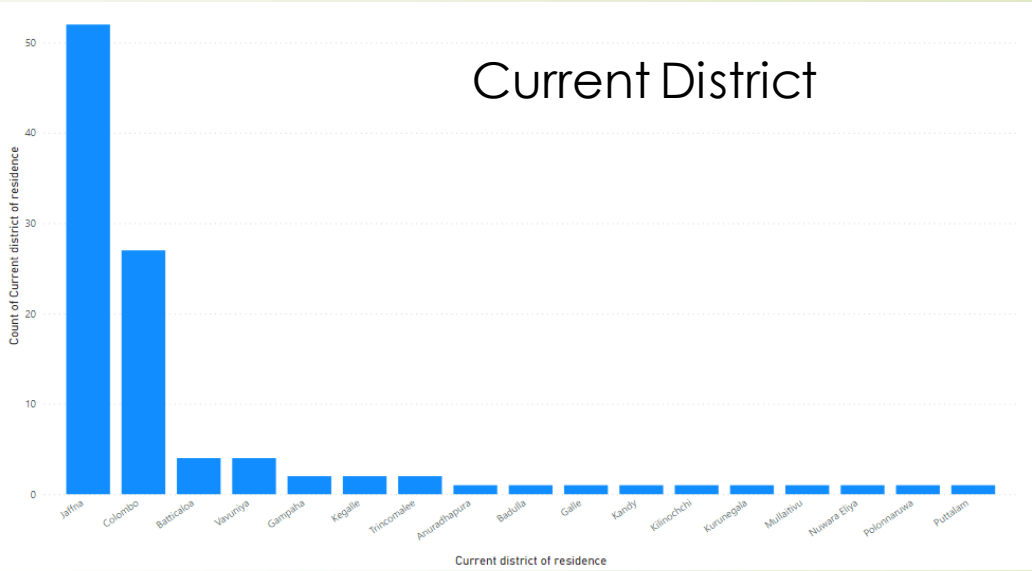
Dataset

- Google Form surveys
- 103 responses
- Responses include
  - Gender
  - Age
  - Current district
  - Domain of study
  - Satisfaction levels – Likert scale
  - Preferred learning environment
- Data cleaning

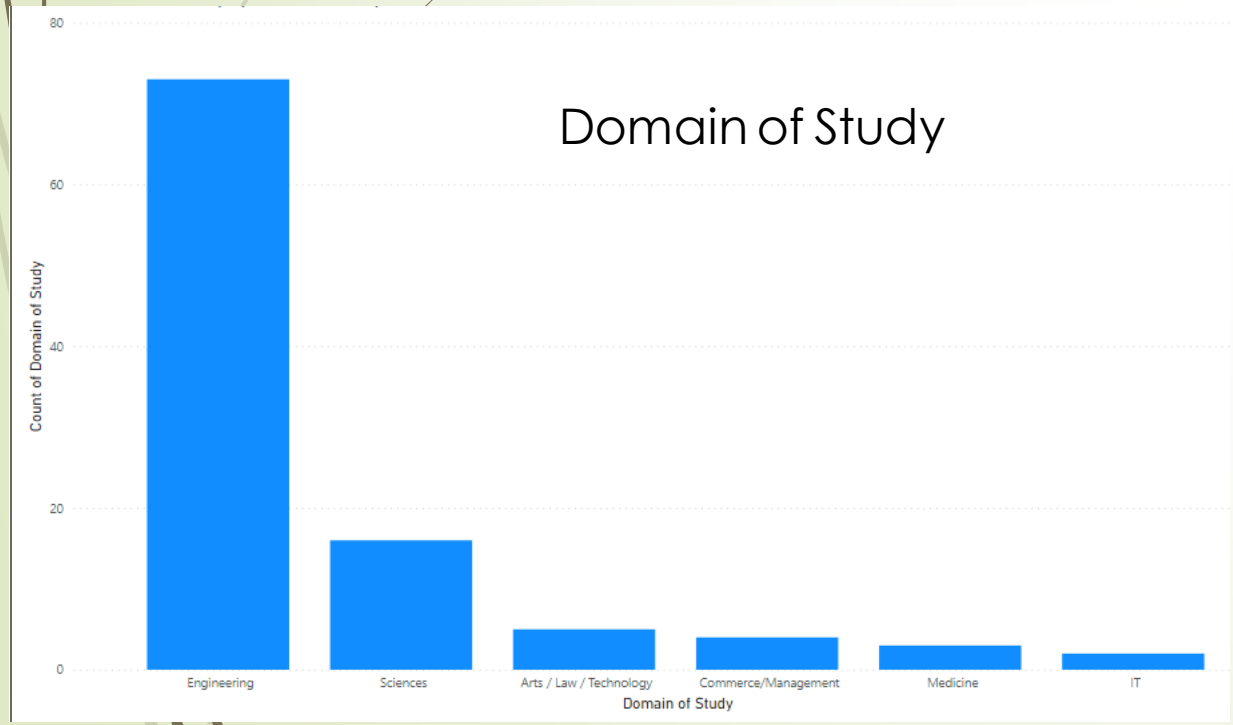
Gender



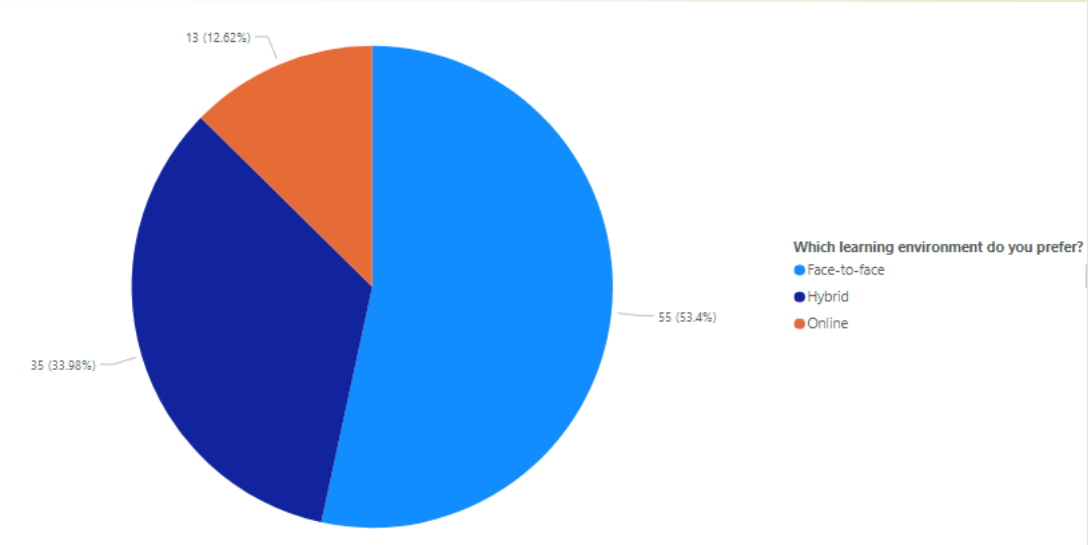
Current District



Domain of Study



Preferred Learning Environment



Problem Definition

- Do engineering students prefer face-to-face learning mode?
- Is there an association between the students' current district and satisfaction level on accessing the reliable software/tools for e-learning?
- Do male students find more time to participate in synchronous classes than female students?

Do engineering students prefer face-to-face learning mode?

- H_0: Proportion of engineering P(e) and other students P(o) who prefer face-to-face learning mode are equal
- H_a: Proportion of engineering who prefer face-to-face learning mode is greater than other students
- Difference in proportion test
- P(e) – P(o) = -0.0931
- Pooled sample proportion = 0.5362
- Standard error = 0.1081
- Test Statistic z = -0.8322
- P value : P(Z <= -0.8322) = 0.203
- Significance level = 0.05
- Hence, we do not reject H_0 (P value > 0.05).
- We do not have much evidence that proportion of engineering P(e) and other students P(o) who prefer face-to-face learning mode are equal

Is there an association between the students' current district and satisfaction level on accessing the reliable software/tools for e-learning?

- H_0: There is no association between the students' current district and satisfaction level on accessing the reliable software/tools for e-learning
- H_a: There is an association between the students' current district and satisfaction level on accessing the reliable software/tools for e-learning
- Chi Square Test for association
- Test statistic $X^2 = 106.816$
- Degrees of Freedom = 64
- P-value = -0.00063
- Significance level = 0.05
- Hence, we reject H_0 (P value < 0.05).
- We have very strong evidence that there is an association between the students' current district and satisfaction level on accessing the reliable software/tools for e-learning

Do male students find more time to participate in synchronous classes than female students?

- H_0: Proportion of male P(m) and female students P(f) who participate in synchronous classes are equal
- H_a: Proportion of male students who participate in synchronous classes is greater than female students
- Difference in proportion test
- P(m) – P(f) = 0.09
- Pooled sample proportion = 0.6505
- Standard error = 0.0947
- Test Statistic z = 0.9465
- P value : P(Z <= -0.9465) = 0.828
- Significance level = 0.05
- Hence, we do not reject H_0 (P value > 0.05).
- We do not have much evidence that proportion of male P(m) and female students P(f) who participate in synchronous classes are equal

Conclusion

- Do engineering students prefer face-to-face learning mode? **No evidence**
- Is there an association between the students' current district and satisfaction level on accessing the reliable software/tools for e-learning? **Yes, very strong evidence**
- Do male students find more time to participate in synchronous classes than female students? **No evidence**