

# Bahan Kuliah Statistics

Ari Purnawan  
Jurusan Pendidikan Bahasa Inggris

- Mata kuliah: Statistics
- Kode : PEN 214
- Kredit: 2 sks
- Semester: 7

**Bahan Kuliah**

- 1 Overview
- 2 Research and statistics
- 3 Measurement scales
- 4 Descriptive Statistics: Central Tendency and variability
- 5 Inferential Statistics: The concepts of hypothesis testing
- 6 Research Designs
- 7 Determining sample size and sampling techniques
- 8 Mid-semester test
- 9 Parametric and non parametric statistics
- 10 Chi square
- 11 Product moment correlation
- 12 Rank-order correlation
- 13 The t-test
- 14 Anova
- 15 Validity and Reliability
- 16 Final exam

## List of Topics

- What is research?
- A systematic approach to finding answers to questions.
- Systematic → certain condition must be present in order for the results to be valid and useful.
- Should be the most efficient way of answering the questions.

## Research and Statistics

- the extent to which the outcome is a function of the factor we have selected rather than other factors we haven't controlled.

**Internal Validity**

- The extent that the outcome of any research study would apply to other similar situations in the real world.

**External validity**

- Definition: an attribute of a person or of an object which varies from person to person or from object to object.
- Scales:
  - A. nominal
  - B. ordinal
  - C. interval
  - D. ratio

## Variables

- Independent variable
- Dependent variable
- Moderator variable
- Control variable
- Intervening variable

**Functions:**



- A. Pre experimental design
- B. True Experimental design
- C. Quasi experimental design
- D. ex-post facto design
- E. Factorial design

## Research Design

- 1. one shot case study
- 2. one group pretest posttest
- 3. Intact group design

## **A. Experimental Designs**

- 1. posttest-only control group design
- 2. Pretest posttest control group design

## **B. True experimental designs**

- Time series designs:
- T1 T2 T3 X T4 T5 T6
- T1 X T2 → T3 O T4 → T5 X T6, etc

**Quasi Experimental designs**

- A. Central tendency

Tells us about the central point in the distribution of scores in the data.

- B. Variability

Tells us about the variability among scores or how they spread out from the central point.

**Describing the data**

- Mode
- Median
- Mean
- (The mean is the most commonly used measure of central tendency, because it takes all scores into account)

**Central tendency**

- Range (subtracting the lowest score from the highest score in the distribution)
- Standard deviation

**Variability**

- Some important terms:
- Inferential statistics
- Level of significance
- Directional hypothesis (one tailed)
- Nondirectional hypothesis (two tailed)

**Probability and hypothesis testing**



- 1. The t-test

Is used to compare two means

2. Anova (comparing means of 2 or more groups)

3. Factorial Design

4. Chi square

5. Correlational analysis

**Some statistical techniques**

- Hatch, E. and Farhady, H. 1982. *Research design and statistics for applied linguistics*. London: Newbury House.
- Tuckman, B.W. 1988. *Conducting educational research 3<sup>rd</sup> ed.* London: Harcourt Brace.

## References