

Statistic for Educational Research

MPU1034

Topic 1 : Introduction to Descriptive Statistics and Inferential Statistics

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1. What do we mean by statistics?

- Statistics as a quantitative value such as the mean, mode and median that can be used to describe a group of data.
- Statistic as procedures used by researchers to organize and interpret the observed data.

2. Why learn statistics?

1. Statistics are all around us.
2. Statistics as a tool to analyze data.

2. Why learn statistics?

However, as long as the social sciences are founded in science, a knowledge of statistics is necessary. Scientific research is the system that we use to gather information, and statistics are the tools that we use to distill the information into sensible and sensible and justified conclusions

3. The scientific method consists of the following steps:

1. Identify the problem
2. Make or generate hypotheses
3. Design the research/experiment
4. Analyze data
5. Draw conclusions

(Statistical methods are used in steps 4 and 5)

4. Definitions of some terminologies

Population - the total set of subjects of interest in the study.

Sample - the subset of the population on which the study collects data. The sample is assumed to be representative of the population.

Variable- is a characteristic or condition that changes or has different values for different individual, usually represented by the letters of the alphabet, such as X, Y or Z or any letter of the alphabet.

Constant – the characteristic or condition that does not vary but is the same for every individual.

Correlational method - two variables are observed to see whether there is a relationship.

Experimental method - one variable is manipulated while changes are observed in another variable.

Independent variable - is the variable that is manipulated by the researcher. It usually consists of the two (or more) treatment conditions to which the subjects are exposed.

Dependent variable - the variable that is observed to assess the effect of the treatment.

Control group – the group that does not receive any treatment. To provide baseline for comparison.

Hypothesis - a prediction on the outcome of a certain action(s). Hypotheses should be based on certain theoretical assumptions.

5. Two branches of statistics

i. Descriptive statistics

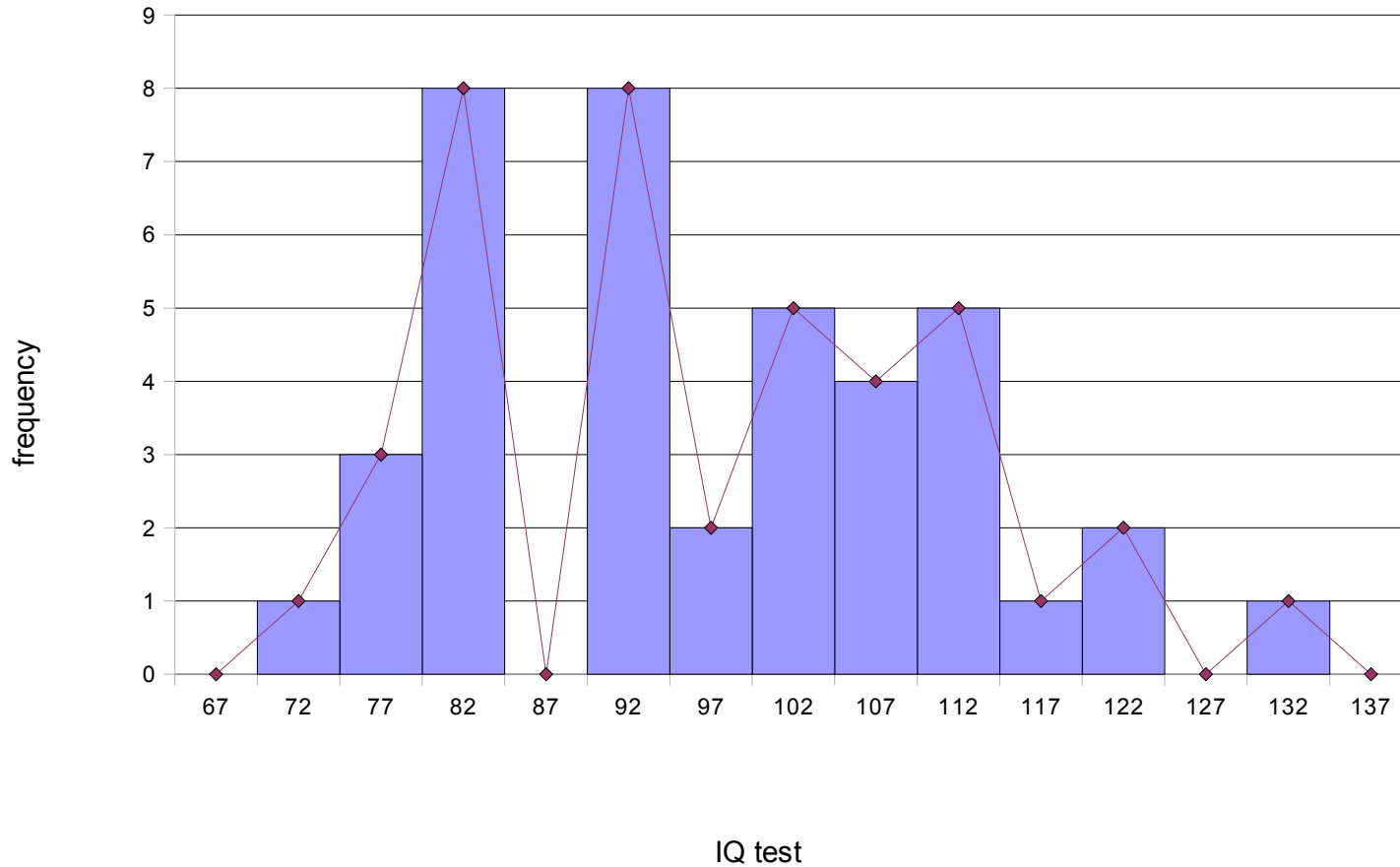
- Raw scores are values, measurement or observed values –referred to as data.
- Descriptive statistics are procedures or techniques that aims to summarize the raw scores in more meaningful ways)

ii. Inferential statistics

- Procedures of techniques that can be used to study the sample and make generalizations about the population from which the sample was obtained or chosen

Class intervals, exact limits, and midpoint for frequency distribution of IQ

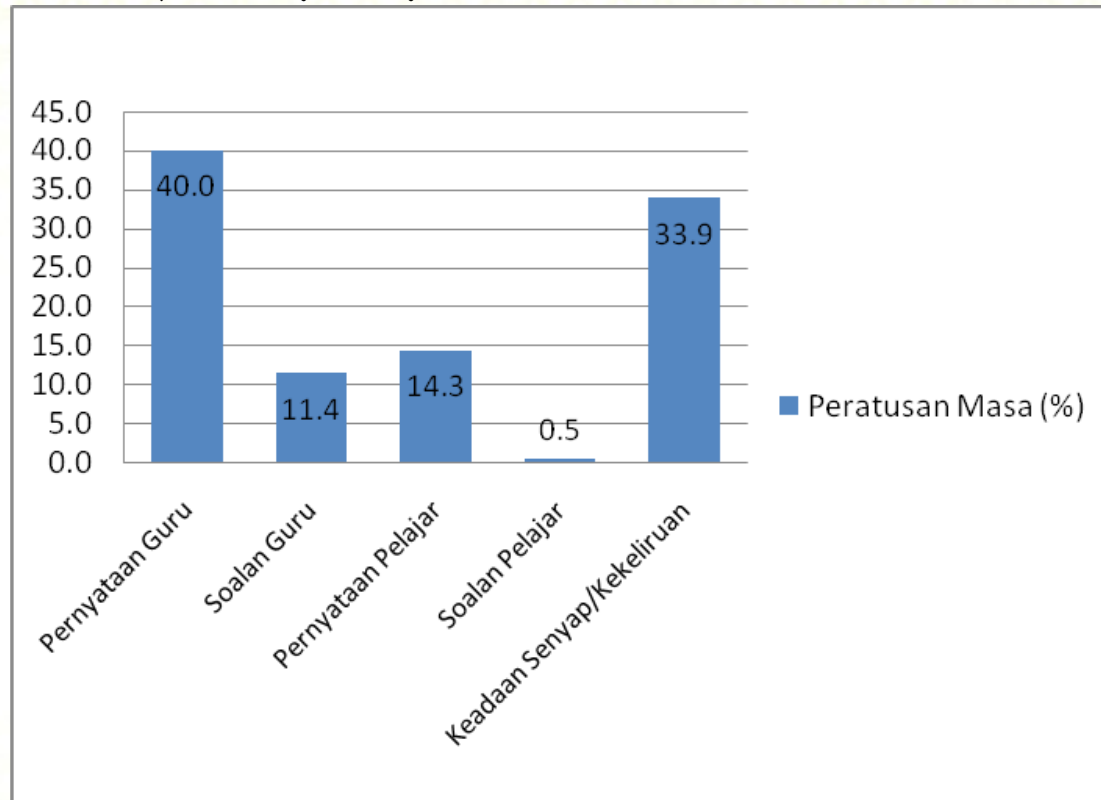
1 Class interval	2 Exact limits	3 Midpoint of interval	4 Frequency
130-134	129.5-134.5	132.0	1
125-129	124.5-129.5	127.0	0
120-124	119.5-131.5	122.0	2
115-119	114.5-119.5	117.0	1
110-114	109.5-104.5	112.0	5
105-109	104.5-109.5	107.0	4
100-104	99.5-104.5	102.0	5
95-99	94.5-99.5	97.0	2
90-94	89.5-94.5	92.0	8
85-89	84.5-89.5	87.0	0
80-84	79.5-74.5	82.0	8
75-79	74.5-79.5	77.0	3
70-74	69.5-74.5	72.0	1



Histogram and frequency polygon

Verbal interaction of teaching and learning Science in Primary School

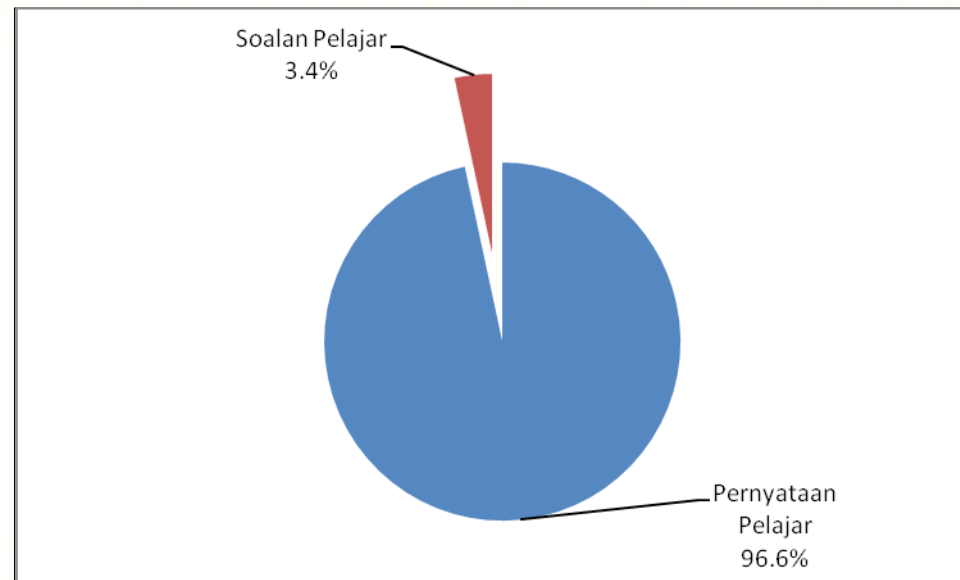
Tay Chong Seng & Mohammad Yusof Arshad



Bar Chart of Percentage of Main Category Verbal Interaction

Verbal interaction of teaching and learning Science in Primary School

Tay Chong Seng & Mohammad Yusof Arshad

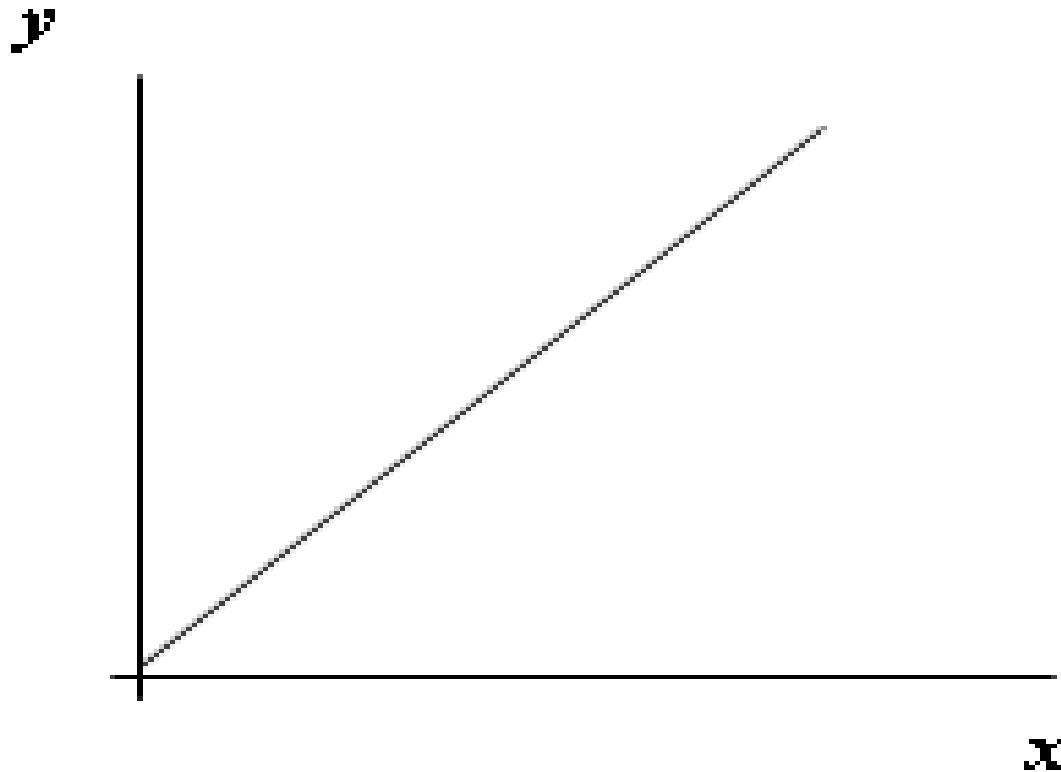


Comparison of Category Between Students' Statement and Question

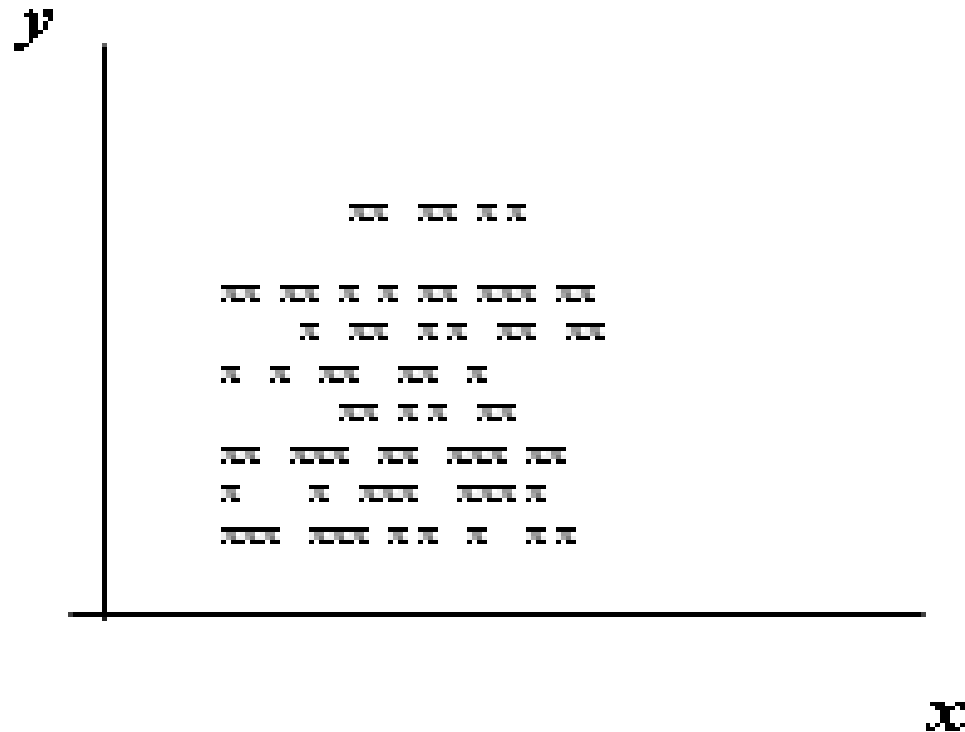
8. Correlation

- Correlation is the statistics used to measure and describe the relationship between two variables.
- A correlation needs at least two variables normally symbolize by X and Y
- Correlation values may be positive or negative

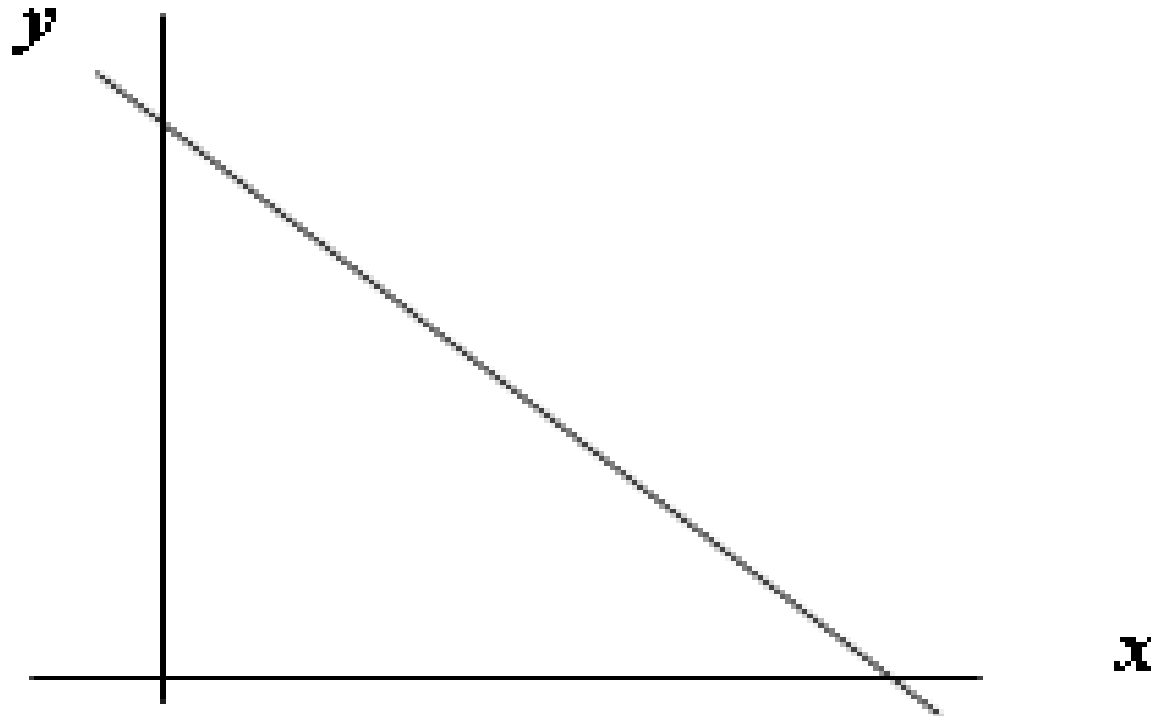
- Correlation, $r = +1$, shows a perfect correlation



ii. Correlation $r = 0$ shows no relationship



iii. $r = -1$ show a perfect relationship
 but the reverse of case a



The effects of Instruction is Assisted Geometer's Sketchpad on Student Achievement in Topic Transformation (t-test for dependent means)

Dr Azlina binti Mohd Kosnin
Puan Suhaila binti Abdullah

Group	Pre Min Test	Post Min Test	t, df, P
Experimental	10,26	12.64	t-6.85, df-49, P=0.00
Control	9.9	9,18	t=-2,11. Df=49. p=0.45

Urban and Rural Residents Attitudes Towards Gun Control (t-test for independent means)

Neil J Salkind (2004)

Group	N	Mean	t	df	sig (2-tailed)
Urban	16	6.51	1.17	28	0.25
Rural	14	5.4			

The Effects of Pre-schooling on Language Development

(One Way Anova)

Group 1	Group 2	Group 3
5 hours/week	10 hours/week	15 hours/week
Test Scores	Test Scores	Test Scores

The Effects of Pre-schooling on Language Development

(Factorial Design)

Ethnic	Gender	Group 1	Group 2	Group 3
		5 hours/week	10 hours/week	15 hours/week
Malay	Male	Test Scores	Test Scores	Test Scores
	Female	Test Scores	Test Scores	Test Scores
Chinese	Male	Test Scores	Test Scores	Test Scores
	Female	Test Scores	Test Scores	Test Scores
Indian	Male	Test Scores	Test Scores	Test Scores
	Female	Test Scores	Test Scores	Test Scores