IJESC

The Teaching of Secondary School Statistics

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Abstract
There is need that every day-to-day activities in all situations should be recorded through collection of facts from which conclusion may be drawn from the past, present and for the future. This is down through information collection which can be represented numerically. At the secondary school level, mathematics is inevitable and compulsory subject to all students. Statistic is aspect of mathematics which must be taught by a competent mathematics teacher who in turn would deliver quality knowledge of the subject matter to the leaners' understanding. The learner at this level needs to be acquainted with the knowledge of interest and experiences yet to come in life of the secondary school students " Historical evaluation of situations, reduces or prevent reoccurrence of common mistakes" Ojo (2002). Obtaining data from experiences or experiment for the basis of drawing analysis and conclusion, can play a vital role in the life of the learner both in the present and future. This has given rise to the Secondary school statistics.

INTRODUCTION

Statistics is a mathematics concerned with data collection, presentation, analysis and interpretation. S. Maureen (2001) sees statistics as a means of summarizing experiences. It deal with all aspects of surveys and experiment as it is used widely through systematic approaches and with techniques for making probability based decision and accurate predictions based on incomplete data. The teacher who delivery this knowledge should be well grounded on the skilsl and techniques to be applied to drive this knowledge to it desirable objectives, which make the lesson a success on the part of the learner.

PURPOSE OF THE STUDY

Statistics teaches people to use a limited sample, to make intelligent and accurate conclusions about a greater population, the linear objective on statistics help us to make inferences about a population, understand and interpret variation and make more impact on everyday decisions.

Statistics is an extremely powerful tool available for assessing the significance of an experimental data and also for drawing the right conclusion from it. It is of great help to scientists, engineers and many other professionals, to a right conclusion from experimental data. As it can be studiy, understand, model, embrace and interpret various variation.

DATA: Data isa raw information that is organized and processed numerically in order to be access more quickly.By advance English Dictionary " Data is a collection of fact from which conclusion may reach or drawn.

DATA REPRESENTATION
Data can be presented in tabular form or graphic form.

TABULAR REPRESENTATION
This involves the use of frequency distraction table as a means of representing the members of items in an event or a particular value occurs. For instance, in considering the series of 20 students in a mathematics test, this include ,5,4,5, 2,1,7,8,1,6,5,3,9,5,10,5,5,2,2,6,8.
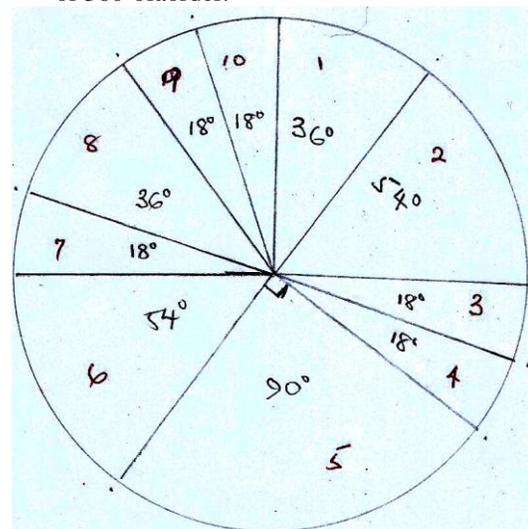
This series can be presented in form of frequency table

Series	Tally	Frequency
0	0	0
1	11	2
2	111	3
3	1	1
4	1	1
5	1111	5
6	111	3
7	1	1
8	11	2
9	1	1
10	1	1
		∑f=20

GRAPHICAL REPRESENTATION
Pictorial form is another name of representing data graphically. This include:
1. **Pie chart:**This representing information under work of 360^0ofaorder.
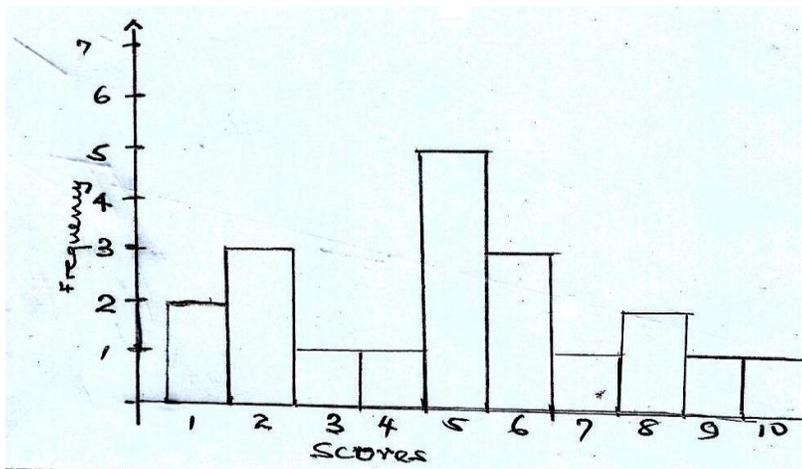
PIE CHART USING FREQUENCY COLUME

SCORES	FREQUENCY	FORMATION PIE CHART USING FREQUENCY COLUME
1	2	$2/20 \times 360^0 = 2 \times 18 = 36^0$
2	3	$3/20 \times 360^0 = 3 \times 18 = 54^0$
3	1	$1/20 \times 360^0 = 1 \times 18 = 18^0$
4	1	$1/20 \times 360^0 = 1 \times 18 = 18^0$
5	5	$5/20 \times 360^0 = 5 \times 18 = 90^0$
6	3	$3/20 \times 360^0 = 3 \times 18 = 54^0$
7	1	$1/20 \times 360^0 = 1 \times 18 = 18^0$
8	2	$2/20 \times 360^0 = 2 \times 18 = 36^0$
9	1	$1/20 \times 360^0 = 1 \times 18 = 18^0$
10	1	$1/20 \times 360^0 = 1 \times 18 = 18^0$

$36+54+18+18+90+54+18+36+18+18=360^0$

ii. Bar chart: (The use of bar in represent figure)

Histogram: This is used for bar with a space in between bar data. Using the table above:
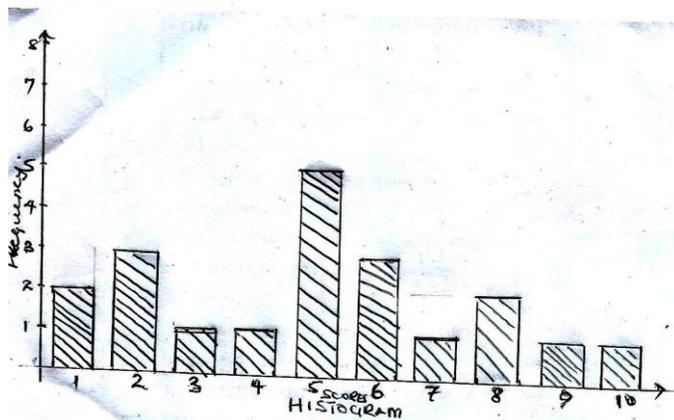
MEASUREMENT OF CENTRAL TENDENCY
Is a statistical quantity which is a measure of centrality of a sample or distribution.

This make use of the following:

MEAN: Is the process of addingall the items and dividing the total by the number of item involved. For instance, in a given test student series, 0,1,2,2,8,5,5.

Series	Tally	Frequency
0	1	1
1	1	1
2	11	2
5	11	2
8	11	3
10	1	1
		$\sum f=10$

Mean= $\overline{X} = \dfrac{X_1 + X_2 + X_3 + \ldots + X_n}{N}$

$\overline{\times} = \dfrac{0+1+2+2+5+8+8+80+10}{10}$ $= \dfrac{49}{10} = 4.9$

Median: Is the middle member in a given distribution or in a member of items

MEDIAN: class = $\left(\dfrac{N+1}{2}\right)$

When "N" stand for the final or last number arrived at, on the cumulative frequency column from the median class **$\left(\dfrac{N+1}{2}\right)$**

Median can be located along the scores column.
e.g

Score	Frequency	Cum.frequency
0	1	1
1	1	1+1=2
2	2	2+2=4
5	2	4+2=6
8	3	6+3=9
10	1	9+1=10

If the median class is 5.5 it fall under 6 in the cum. frequency column, tracing the score, we have 5
:. Median =5

MODE
Is the number with highest frequency in distribution or that which occure most in set of distribution e.g 8 is the mode.

MEASURES OF DISPERSION
Dispersion is a measure of the extent to which data are spread about an average. The range, the difference, Dispersion is design to demonstrate the extent to which individual measure differ on an average from the mean or any positional average. The most frequency used of measure of dispersion include range, semi interquartile, mean deviation, variance and standard deviation.
RANGE
Is the difference between the lowest and highest value in a given distribution. Example in (4,6,9,3,7) the lowest value is 3 and the highest is 9.
Range = 9-3 =6

RANGE 9-3 = 6
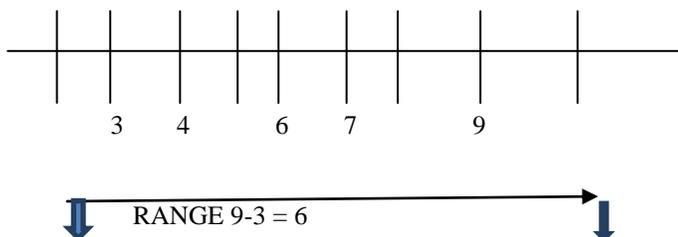
The difference between them is 6

INTERQUARTILE RANGE
Is a measure of variability, based on dividing a data set in quartile. It is also called "**Midspread**" or middle of 50%. This is the difference of 75th and 25th percentile. For every distribution when divided into four part each is called a

Quartile designated as Q_1, Q_2 and Q_3, the differences between the 3rd and 1st quartile is inter-quartile.
$$= Q_3 - Q_1 = Q_2$$

Semi inter-quartile Range
This is lay of inter-quartile Range $= \dfrac{Q_3 - Q_3}{2}$

MEAN DEVIATION

Is the statistical measure of average deviation of values from the mean in a sample. Example score: 2,5,7,10,12,14.

Average $= \dfrac{2+5+7+10+12+14}{6}$

$= 8.3$

SCORE	$(X - \overline{X})$
2	2-8.3 = -6.3
5	5-8.3 = -3.3
7	7-8.5 = -1.3
10	10-8.3 =1.7
12	12-8.3 =3.7
14	14-8.3=5.7

Variance $= \dfrac{\sum(X - \overline{X})}{n} = 0.2$

VARIANCE AND STANDARD DEVIATION
Variance is a measurement of spread between numbers in a date set. It is calculated by taking the differences between each number in the set and the mean, then squared the difference (to make them positive), in which the sum total of the column is divided by the values in the set.
Using the table below;

SCORE(x)	$(X - \overline{X})$	$(X - \overline{X})^2$
2	2-8.3 =6.3	39.69
5	5-8.3 = 3.3	10.89
7	7-8.5 =1.3	1.69
10	10-8.3 =1.7	2.89
12	12-8.3 =3.7	13.69
14	14-8.3=5.7	32.49

$\sum(X - \overline{X})^2 = 102.34$

$\sigma = \dfrac{\sum(X - \overline{X})^2}{n} = \dfrac{102.34}{6} = 16.89$

Standard deviation is the square root of variance

$S = \sqrt{\sigma} = \sqrt{\dfrac{\sum(X - \overline{X})^2}{N}}$

CONCLUSION
    Teaching of statistic in secondary school creates an opportunity for the learning acquires in statistical knowledge and organized in personality. Alsoit gives room for learners to aspire in reading or do very well in statistical related courses in tertiary institutions. In this context the lesson would be very attractive and interest in the classroom and knowledge

acquired would aid computation power of data as a cheap and accessible in analyses and projection.

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