

UNIVERSITY OF SWAZILAND

FACULTY OF EDUCATION



DEPARTMENT OF EDUCATIONAL FOUNDATION AND MANAGEMENT

FOR

INSTITUTE OF POST GRADUATE STUDIES

DECEMBER, 2014 FINAL EXAMINATION PAPER

MASTER OF EDUCATION (M.Ed)

COURSE CODE : EDF 650

TITLE OF PAPER : RESEARCH DESIGN AND TECHNIQUES

TIME ALLOWED : THREE HOURS

INSTRUCTIONS : ANSWER ANY **THREE** QUESTIONS OF
YOUR CHOICE

TOTAL MARKS : 100

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION TO DO SO HAS BEEN GRANTED BY THE INVIGILATOR.

1. Discuss the importance of literature review in an educational research

Total: 33, 3 Marks.

2. Discuss the importance of a research proposal in quantitative research

Total: 33, 3 Marks.

3. Discuss the assertion that the research hypotheses are as critical as the research questions/objectives in an educational research

Total: 33, 3 Marks.

4. Table 1 below is a data set of marks obtained by 10 O'Level pupils in Maths and Physics In-Class tests.

Table 1

Student	A	B	C	D	E	F	G	H	I	J
Mathematics (X)	62	71	72	62	74	83	54	78	67	57
Physics (Y)	63	61	51	62	58	48	75	57	60	75

(a) Calculate the median of the Mathematics marks **(1 mark)**

(b) Locate the mode of Physics marks **(1 mark)**

(c) Calculate the mean of the Mathematics marks **(1 mark)**

(d) Compute the mean of the physics marks **(1 mark)**

(e) Find the standard deviation of the Physics marks **(5 marks)**

(f) Suppose the standard deviation of the Mathematics is 9.29, determine the subject in which student D did better **(2marks).**

(g) Give any **two** advantages and **two** disadvantages of using the mean to explain students' performance **(4 marks)**.

(h) From the data given in **Table 1** above:

(i). Compute Spearman rank order correlation coefficient and comment on it **(9 marks)**.

Table 2: A data set of marks obtained by 10 O'level pupils in Maths and Physics tests.

PUPIL	A	B	C	D	E	F	G	H	I	J
MATHS	80	60	72	47	62	75	64	58	72	70
PHYSICS	78	61	70	52	60	75	65	60	70	70

(j). Carry out a t-test at 1% significance level to determine if there is a difference between the students' performance in Mathematics and in Physics **(9,3 marks)**.

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STATISTICAL FORMULAE

Sample Variance:
$$S^2 = \frac{\sum(x-\bar{x})^2}{n-1}$$

Sample Standard Deviation:
$$s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$$

Product moment correlation coefficient:

$$r_{xy} = \frac{n\sum xy - \sum x \sum y}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Spearman's rank order correlation coefficient:
$$rho = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

Chi-squared Test Statistic:
$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Z-score:
$$z = \frac{x-\bar{x}}{s}$$

Standardisation:
$$z = \frac{u-\mu}{\sigma}$$
 Where $Z \sim N(0,1)$

T-score:
$$T = 50 + 10 \left(\frac{x-\bar{x}}{s} \right)$$

Student t-test:
$$t = \frac{\sqrt{(n-1)\sum d}}{\sqrt{n\sum d^2 - (\sum d)^2}}$$