

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

EDUCATIONAL FOUNDATIONS DEPARTMENT

DIPLOMA IN SCIENCE EDUCATION

DD004/PC015: RESEARCH METHODS AND STATISTICS

TIME : 3 HOURS

INSTRUCTIONS

1. Answer three questions.
 2. Answer 2 compulsory questions in Section A
 3. Answer one question from each of Section B and C
 4. Each question answer should start on a new page.
 5. Question 1 carries 40 marks. Questions 2, 3, 4 and 5 carry a total of 30 marks each.
- OCT 2024*

SECTION A: COMPULSORY QUESTION

Read the abstract below and then answer the questions which follow:

ABSTRACT

This study explored how foundation phase heads of departments manage and support professional development in the foundation phase. The study also explored the support these heads of departments receive from external sources in managing and supporting teachers in their professional development. Teachers' perspective about their professional development and support from heads of departments were also explored. A qualitative approach, located in an interpretive paradigm, was adopted. Drawing on various elements of case study research designs, the study focused on six foundation phase HoDs, one Intermediate Phase HoD and five foundation phase teachers from different school settings in one of the provinces in South Africa. Interviews and document analysis were used as the primary tools for data collection. During the interviews, teachers outlined their views on the support provided by both heads of departments and external sources that work to enhance their professional learning.

Through a cross-case analysis approach, the study indicated that teachers appreciated the support received from heads of departments and external sources. The main finding of the study was that there was little support for the heads of departments from external sources. Another finding was that there was minimal support for the heads of departments from external sources, predominantly Non-Governmental Organisations. This study indicated none availability of induction programmes for the newly foundation phase heads of departments.

It is recommended that the Mpumalanga Department of Education organise an induction programme for the newly appointed foundation phase heads of departments. The induction should focus mainly on leadership and management. Lastly, it is recommended that government officials from the district, province and nation provide external support that would benefit the foundation phase heads of departments.

1. a) What was the research problem in the abstract? [2]
- b) Which paradigm was utilised in the research? [2]
- c) Which research approach was used in this study [2]
- d) Write two research questions that could have guided this study. [8]
- e) Identify the data collection instrument used in this study. [2]
- f) Write the design which the researcher used in the study. [2]
- g) Identify three conclusions which the researcher made for this study. [6]
- h) Which analysis did the researcher use in this study? [2]
- i) State the recommendations that were provided for this study? [4]
2. Explain the differences between qualitative and quantitative research approaches. [10]

SECTION B: RESEARCH METHODS

Answer one (1) question from this section

- 2a). Describe Action Research [7]
- b). Illustrate by way of a diagram and explain the four main Action Research cycles/stages [8]
- c). Describe at least three data collection tools a researcher would use in Action Research. [15]
3. One of the approaches a student can use in doing a project is quantitative.
- a). Define quantitative research. [3]
- b). Compare and contrast cluster sampling from purposive sampling [12]
- c). Describe circumstances which you can consider to use the following quantitative analytical tools
- i. T-test [4]
- ii. Chi-square [4]
- iii. Correlation coefficient [4]
- iv. Bar graphs [3]

SECTION C: STATISTICS FOR EDUCATIONAL RESEARCH

Answer one (1) question from this section

4. An understanding of basic statistics is required to do good research.

a) Define the following terms

i. Sample [2]

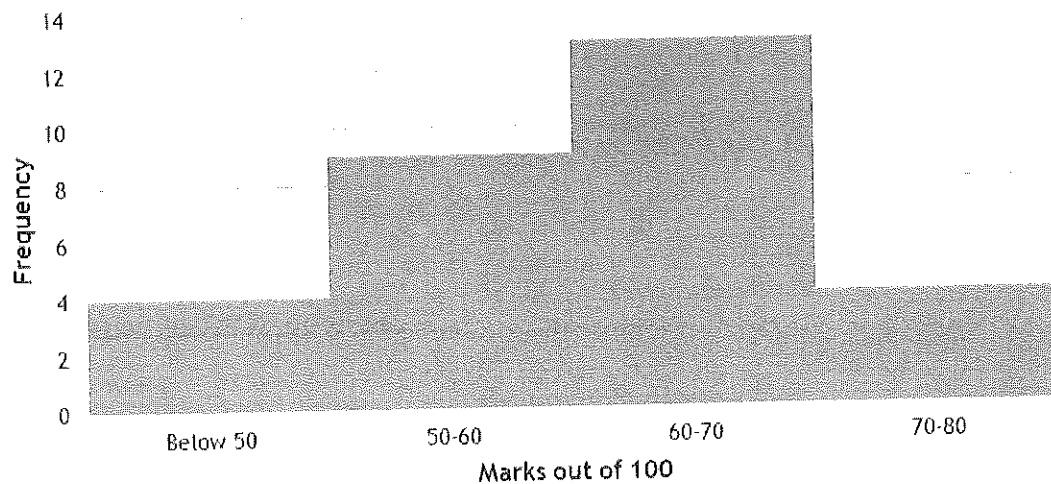
ii. Population [2]

iii. Statistic [2]

iv. Parameter [2]

b) Differentiate between descriptive and statistics inferential statistics [4]

c) Figure 1 below presents data on students' performance in a STEM subject



i). What type of graph is Figure 1? [2]

ii). What type of data is presented in Figure 1? [2]

iii). Suggest any two reasons why Figure 1 was chosen to represent this data. [4]

iv). What conclusion can be drawn from the graph about students' performance in a STEM subject? [6]

v). Give any two limitation of presenting data as in Figure 1 [4]

5. Dr. Sunzuma was teaching a Statistics course at Bindura University of Science Education. The course prepares students for project work which they do in their final year of study. Table 1 shows the average performance of students in the course.

Table 1: Students' marks

65	72	63	65	47	77	65	48	54	69	63	62	58
	67	63										
72	63	75	47	51	63	53	49	63	57	58	54	66
	54	50										

- a) State the sample size. [2]
- b) What is the sample frequency? [2]
- c) Use a frequency distribution table to present this data. [6]
- d) Define the following measures of central tendency
 - i. Mode [2]
 - ii. Mean [2]
 - iii. Median [2]
 - iv. Range [2]
- e) Calculate:
 - i. Median [3]
 - ii. Mean of this data set [3]
- f) Which of the two measures of central tendency you have calculated in (e) would be used to predict students' preparedness for project work? [2]
- g) Suggest any two reasons for your choice in (f). [2]
- h) Predict students' preparedness for project work. [4]

- **END OF PAPER** -