Chapter 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter discussed the nature of instructional leadership and its influence on the learners' academic achievement. The present chapter focuses on the research methods and procedures followed during the collection of data from the respondents. As such, the chapter contains information on the research design, namely, the sampling procedure, the data collecting instrument as well as the validity and reliability. The chapter also explains the data analysis method which will be used for analyzing the data in chapter four. Finally, this chapter explains the method to be used for testing null-hypotheses. The results of data analysis will be presented in chapter four.

3.2 THE SETTING FOR THE RESEARCH

This section contains information on the place / site where the empirical research was conducted. The administration of the questionnaires was conducted in six secondary schools in the Vryheid region. Three of the six secondary schools were the schools with relatively high academic performance while the other three were the schools with relatively low academic performance in the grade 12 final examinations in three educational districts in the Vryheid region during the period of three years. One school with relatively high academic performance and one school with relatively low academic performance were selected from each educational district (see table 3.1).

For this study, the secondary school classified as the school with relatively high academic performance was the one with a pass rate above 70% while the secondary school classified as the school with relatively low academic performance was the one with a pass rate below 50% in the grade 12 final examinations for three successive years. The six secondary schools selected for data collection purpose are listed as A1 and B1 in Table 3.1 below. The actual names of schools are not given for confidential and ethical reasons.

Table 3.1: Schools selected for empirical research

Bhekuzulu District	***Nqutu District***	***Paulpietersburg District***
A1	A1	A1
B1	B1	B1
A1 = School with high academic performance		B1 = School with low academic performance

All six secondary schools are located in rural areas in the three educational districts of Vryheid region.

3.3 THE CRITERIA FOR SELECTION OF SCHOOLS FOR EMPIRICAL INVESTIGATION

The selection of the six schools for the empirical investigation was based on the following criteria / characteristics:

The grade 12 pass rates of the six schools differ significantly, thus providing clearly extreme cases for comparisons. Academically, three schools constantly achieved the overall pass percentage above 70% while the other three schools constantly achieved the overall pass percentage below 50%. Tables 3.2 (a), (b)

and (c) show the grade 12 pass rates of the six schools chosen for empirical investigation.

Table 3.2 (a): Grade 12 pass rates in %

Bhekuzulu District			
Schools	***Years and pass rates***		
	1997	*1998*	*1999*
A1	*95.35 %*	*77.03 %*	*87.04 %*
B1	*28.14 %*	*35.35 %*	*26.58 %*

Table 3.2 (b): Grade 12 pass rates in %

Nqutu District			
Schools	***Years and pass rates***		
	1997	*1998*	*1999*
A1	*87.10 %*	*74.23 %*	*96.23 %*
B1	*22.58 %*	*26.76 %*	*17.76 %*

Table 3.2 (c): Grade 12 pass rates in %

Paulpietersburg District			
Schools	***Years and pass rates***		
	1997	*1998*	*1999*
A1	*76.06 %*	*73.63 %*	*77.63 %*
B1	*12.35 %*	*13.86 %*	*12.50 %*

Source: KwaZulu / Natal - Annual Report, Vryheid region - Statistics, Examinations Section (1997-1999)

The total enrolments for the six schools did not seem to differ significantly. Tables 3.3 (a), (b) and (c) show the total enrolments for the six secondary schools selected for the current study. The total enrolments are for the 1997, 1998 and 1999 academic years.

Table 3.3 (a): Total enrolments

Bhekuzulu District			
Schools	***Years and total enrolments***		
	1997	*1998*	*1999*
A1	*652*	*678*	*710*
B1	*685*	*693*	*751*

Table 3.3 (b): Total enrolments

Nqutu District			
Schools	***Years and total enrolments***		
	1997	*1998*	*1999*
A1	*708*	*739*	*874*
B1	*731*	*768*	*926*

Table 3.3 (c): Total enrolments

Paulpietersburg District			
Schools	***Years and total enrolments***		
	1997	*1998*	*1999*
A1	*461*	*483*	*521*
B1	*506*	*517*	*553*

Source: KwaZulu-Natal - Annual Report, Vryheid region, Statistics, Provisioning Section (1997-1999)

The number of classroom facilities and teaching staff in the six schools also did not seem to differ significantly. Tables 3.4(a), (b) and (c) show the number of classrooms and teaching staff at each of the secondary schools selected as the cases of study in the current study.

Table 3.4 (a): Classroom facilities and teaching staff

Bhekuzulu District						
Schools	***Classroom facilities***			***Teaching staff***		
	1997	*1998*	*1999*	*1997*	*1998*	*1999*
A1	*28*	*28*	*28*	*18*	*18*	*19*
B1	*26*	*26*	*26*	*18*	*18*	*19*

Table 3.4 (b): Classroom facilities and teaching staff

Nqutu District						
Schools	***Classroom facilities***			***Teaching staff***		
	1997	*1998*	*1999*	*1997*	*1998*	*1999*
A1	*24*	*24*	*24*	*18*	*19*	*19*
B1	*26*	*26*	*26*	*19*	*20*	*20*

Table 3.4 (c): Classroom facilities and teaching staff

Paulpietersburg District						
Schools	***Classroom facilities***			***Teaching staff***		
	1997	*1998*	*1999*	*1997*	*1998*	*1999*
A1	*21*	*21*	*21*	*15*	*15*	*16*
B1	*24*	*24*	*24*	*16*	*16*	*17*

Source: KwaZulu-Natal - Annual Report, Vryheid region - Statistics, Provisioning Section (1997-1999)

- The six schools are situated in similar rural areas.
- The six schools have grade 8 as the lowest class and grade 12 as the highest class.
- The six schools have permanently appointed principals, one deputy principal and three heads of department in each school.

3.4 ARRANGEMENTS FOR ACCESS TO SCHOOLS

The letters requesting permission to administer questionnaires in the six identified schools were written to the District Heads of the three districts in which the six schools are located (see Appendix A). The purpose of conducting research in schools was explained in the letters sent to the District Heads. The approval to conduct research in the six schools was granted (see Appendix B). The District Heads informed the principals of the schools that permission had been granted to the researcher to conduct research in their schools.

3.5 SAMPLING PROCEDURE

3.5.1 The study sample

According to Stoker (1989: 100) and Turney and Robb (1989: 107), a sample for a study is a selected finite set of persons, objects or things that the researcher employs in his / her study. As such the sample forms a subset of elements of the population. The assertion by Stoker (1989: 100) is that a sample for the study is essential because it is not feasible to study the whole population directly, because of size, cost, limited time and lack of accessibility of the whole target population. For this study, the sample consisted of 110 educators teaching grades 10 to 12 in the six secondary schools selected for the study. The sample was selected following the criteria listed in section 3.5.2 below.

3.5.2 The criteria for sample selection

In the choice of the sample for research, Merriam (1991: 48) recommends that one should select the sample from which one can learn the most. This means that the selected sample should consist of people rich in the information needed by the researcher. When choosing the grades 10 to 12 educators to be the sample of this study, the following criteria were taken into consideration:

- The grades 10 to 12 educators were considered to be knowledgeable about the instructional leadership practices in their schools.
- The grades 10 to 12 educators chosen to be part of the sample were those that had been at their schools for two years and more.
- The educators were easily accessible sources of information on instructional leadership practices in their schools.

3.5.3 Selection of the sample

When selecting a sample for a case study such as the current study, Merriam (1991: 47) recommends that the researcher should first identify the case to be investigated. Then within the case a sample is drawn. In this study, six schools were identified on the basis of their typicality with regards to grade 12 pass rates in the provincial examinations to be the cases for investigation. The purpose of identifying two cases, instead of one case, was to cater for the comparative nature of the study. The study compared the principal's instructional leadership in the secondary schools with an aim of explaining the differences in secondary schools' academic achievement.

Of the two identified cases, one was the case of the schools with higher academic achievement and the other one was the case of schools with lower academic achievement in the grade 12 final examinations. All the chosen schools for the study were rated in terms of the overall grade 12 learners' achievement in the grade

12 final examinations (see table 3.2 above). From the six identified schools, a sample of 110 educators was obtained to served as the respondents for the study. Keeping in mind the criteria listed in section 3.5.3 above, the purposeful sampling method was used in building up the sample for the study.

According to Patton (1990: 169), purposeful sampling enables the researcher to select information rich respondents for the study. Cohen and Manion (1994: 89) maintain that, when choosing the sample through the use of purposeful sampling, the researchers hand-pick the respondents to be included in the sample on the basis of the researchers' judgement of the respondents' typicality. Accordingly, all educators teaching grades 10 to 12 classes and employed at the schools identified for research for two years were selected to serve in the sample of respondents for the current study.

3.6 PILOT STUDY

Before the research instrument(s) is/are used for collecting data from the respondents, it is essential for the researcher to conduct a pilot study (Schnetler, 1989: 87). According to Oppenheim (1992: 47), the pilot study is a process of trying out the questionnaire(s). This means that a pilot study is done to test the research instrument(s) in order to see whether refinement is needed. The pilot study was conducted in one secondary school. The school used for the pilot study was the school with most characteristics similar to the characteristics of the schools identified for the research. The secondary school that was involved in the pilot study was then excluded from the main empirical research process of the study.

A letter requesting permission to conduct the pilot study in the school selected for such purpose was issued to the District Head of Bhekuzulu District (see Appendix C).

The questionnaire was administered by the researcher personally. As a result of the pilot study, one item in the questionnaire had to be refined / rephrased.

3.7 DATA GATHERING INSTRUMENT

To collect the needed data in this study, a questionnaire was used (see Appendix D).

3.7.1 The questionnaire

Harris and Bell (1994: 64) and Sibaya (1996: 70) define the questionnaire as a collection of written statements or questions relating to the situation or phenomenon being studied. Accordingly, for the present study, a series of statements related to instructional leadership tasks were formulated and arranged in such a way that the questionnaire was developed.

The respondents were expected to rate the practice of instructional leadership by their principals in their schools on a four-point scale, namely, strongly agree **(4)**, agree **(3)**, disagree **(2)** and strongly disagree **(1)** on fourteen (14) items in the questionnaire, while on six (6) items in the questionnaire, the respondents were expected to respond by indicating " Yes" or "No". Each respondent had to respond to the items in the questionnaire by writing in the middle column of the special answer sheets provided to him / her (see Appendix E) the number that conveyed the feeling the respondent had about the practice of instructional leadership task statements listed in the questionnaire.

3.7.2 The validity and reliability of the questionnaire

3.7.2.1 Validity

Validity of research instrument(s) is crucial in all research regardless of discipline in which the research is conducted (Budhal, 2000: 60). Wallen and Fraenkel (1997: 133) define validity as the appropriateness, meaningfulness and usefulness of the conclusions the researcher makes on the basis of the collected data. For Budhal (2000: 61) validity in research is the authenticity of what is accurately happening in a particular situation that is being studied. Both of the above-mentioned definitions of validity imply the ability of research instrument(s) to collect valid data so that valid conclusions can be made on the basis of such data. In this study, validity was addressed in the following ways:

(a) Face validity

Face validity, according to Dempsey and Dempsey (1996: 61) and Coolican (1994: 153), is determined by inspecting the research instrument in order to see if it contains items on the important topics, variables and processes relating to the subject of study. Obviously, the researcher and the people assisting him/her during the face validation process of the research instrument use personal judgement of whether the research instrument in question contains important variables on the subject of study. Thus, Cozby (1996: 31), Nachmias and Nachmias (1992: 158) and Uys and Basson (1991: 78) maintain that face validity calls for a high degree of subjectivity.

In the current study, face validity was ensured by including in the questionnaire, items on important topics, variables and processes constituting the instructional leadership as defined by authors or researchers regarded as having authority on the subject of study. The topics, variables and processes regarded as being major components of instructional leadership and on which items were included in the questionnaire are:

- Staff development.
- Formulation and communication of clear school's academic goals and policies.

- # Mobilising resources for the school.
- # Monitoring academic progress.
- # Supporting the teachers and the learners.
- # Holding high academic expectations for educators and learners.
- # Setting the atmosphere of order, discipline and purpose (Bartell, 1990: 119; Hargreaves & Hopkins, 1993: 109; Kruger, 1999: 13; Smith & Andrews, 1989: 08).

Also considered during the designing of the questionnaire, as part of its validation process was the content validity.

(b) Content validity

Coolican (1994: 153), Kerlinger (1989: 417), Nachmias and Nachmias (1992: 159), Rosenthal and Rosnow (1991: 60) and Uys and Basson (1991: 78) assert that content validity in a research instrument is the representativeness of the topics, variables and processes making up the subject of study, in the research instrument. In other words, for the research instrument to have content validity, the researcher, when designing the research instrument should ask himself/herself the following question: Are all the main components of the subject of study, as defined by people holding authority in the subject of study, represented by items in the research instrument?

In the current study, content validity was ensured by including, in the questionnaire, three items per important variable of instructional leadership as defined by people regarded as having authority on instructional leadership (Bartell, 1990: 119; Hargreaves & Hopkins, 1993: 109; Kruger, 1999: 13; Smith & Andrews, 1989: 08). The instructional leadership variables considered to be important in this study, and as such discussed at length in the literature review, are those mentioned in the face validity above.

Moreover, as a way of ensuring both face validity and content validity in the questionnaire, as research instrument for this study, suggestions from the supervisor and other experts in questionnaire design, from University of South Africa's School of Education, were incorporated into the questionnaire.

3.7.2.2 Reliability

Reliability of research instrument(s) is defined by Wallen and Fraenkel (1997: 133) as the consistency of data obtained by different researchers from the administration of the same research instrument(s) to the respondents who are in comparable settings. The reliability of a research instrument such as the questionnaire, is difficult to predict because it is determined statistically after the participants have completed the questionnaires. According to Brink (1987: 158), the method chosen to determine the reliability of the research instrument depends on the nature of the instrument, and the aspect of the instrument which is of great interest to the researcher.

Because the researcher used the questionnaire as the research instrument in the current study, the aspect of the instrument that was of great interest to the researcher was the internal consistency. Brink (1989: 159) defines the internal consistency as the extent to which items in the questionnaire measure the same thing. That is, the extent to which items in the questionnaire measure the same characteristic or attribute. For the current study, the reliability was determined by calculating the Cronbach's alpha coefficient . The service of an expert in quantitative research at University of South Africa's Faculty of Education was utilised for the calculation of the Cronbach's alpha. The Cronbach's alpha was determined to be 0.9225. According to Brink (1989: 161) a high alpha value, a value close to 1 should be taken to be evidence that the research instrument is measuring just one attribute.

The Cronbach's alpha value of 0.9225 is high, therefore the researcher concludes:

- that all items in the questionnaire measured one leadership characteristic, namely, instructional leadership at selected secondary schools in the Vryheid region, and
- that the questionnaire used for collecting data was reliable.

3.7.3 Administration of the questionnaire

The questionnaires were administered to grades 10 to 12 educators simultaneously by the researcher himself. On the day of the visit to each school, the researcher requested 30 minutes from the principal for the completion of questionnaires. During the 30 minutes, the researcher gave a full explanation on the purpose of research to grades 10 to 12 educators of the school visited. The reasons for the selection of their school and the research activities in which the educators were expected to participate were explained during the requested 30 minutes.

Before the completion of the questionnaires, the respondents were requested to complete the questionnaires honestly and independently of one another. Each respondent was requested to complete one questionnaire. The respondents wrote their responses to questionnaire items on a special answer sheet (see Appendix E). All completed response sheets were collected from the respondents by the researcher.

3.8 DATA ANALYSIS METHOD

According to Kerlinger (1989: 125), data analysis means categorizing, ordering, manipulating, and summarising data in order to obtain answers to a research problem. Mason and Bramble (1997: 194) assert that the method selected for analysis of data depends on the nature of the data arising out of research instrument used, and the chosen research design, whether it is qualitative or quantitative.

For the current study, a quantitative research design was chosen. The discrete, nominal and quantifiable data were collected through the questionnaire. The collected data were analyzed by using the descriptive statistical methods known as the frequencies, percentages and cross tabulation (Wallen & Fraenkel, 1997: 251; Kerlinger, 1989: 149; Rose & Sullivan, 1993: 104). Kerlinger (1989: 149) defines the cross tabulation as the numerical tabular presentation of data in frequencies and percentages such that the responses of the respondents are cross-partitioned in order to study the relations between them.

In the current study, the frequencies of responses to each statement or question in the questionnaire were calculated. Then the frequencies were converted into percentages in order to make it easy to interpret the results of data analysis. Bless and Kathuria (2001: 15) maintain that it is easier to compare percentages than frequencies because frequencies may be based on samples that are not of the same size.

The analyzed empirical data were then used to test the hypotheses formulated for the study.

3.9 HYPOTHESES

Leedy (1993: 76) and Van der Horst (1997: 43) argue that hypotheses are tentative answers to the problem which is under investigation. Based on the literature study, the following experimental and null-hypotheses were formulated for the current study. The symbols $\mathbf{H_1}$ and **Ho** represent the experimental and the null-hypotheses respectively. The null-hypotheses are tested in chapter four.

Hypothesis 1

H_1: There is a significant difference between the learners' academic achievement in schools where principals clearly formulate and communicate the schools' academic goals and the learners' academic achievement in schools where principals do not clearly formulate and communicate the schools' academic goals.

H_0: There is no significant difference between the learners' academic achievement in schools where principals clearly formulate and communicate the school's academic goals and the learners' academic achievement in schools where principals do not clearly formulate and communicate the school's academic goals.

Hypothesis 2

H_1: There is a significant difference between the learners' academic achievement in schools where principals and educators jointly discuss the learners' academic progress in the various subjects and the learners' academic achievement in schools where principals and educators do not jointly discuss the learners' academic progress in the various school subjects.

H_0: There is no significant difference between the learners' academic achievement in schools where principals and educators jointly discuss the learners' academic progress in the various subjects and the learners' academic achievement in schools where principals and educators do not jointly discuss the learners' academic progress in the various school subjects.

Hypothesis 3

H_1: There is a significant difference between the academic achievement of learners in schools where the principals conduct staff development and the learners' academic achievement in schools where the principals do not conduct staff development.

H_0: There is no significant difference between the academic achievement of learners in schools where the principals conduct staff development and the academic achievement of learners where the principals do not conduct staff development.

Hypothesis 4

H_1: There is a significant difference between the learners' academic achievement in the schools that maintain the academic networks with other schools and the learners' academic achievement in the schools that maintain no academic networks with other schools.

H_o: There is no significant difference between the learners' academic achievement in the schools that maintain the academic networks with other schools and the learners' academic achievement in the schools that maintain no academic networks with other schools.

3.10 HYPOTHESES TESTING

The null-hypotheses stated above are tested and the results thereof presented in chapter four. The chi-square ($\div^2$) test is used to test the null- hypotheses. The chi-square test was selected because the data from the empirical investigation were in categories and were analyzed by determining the frequencies and percentages. At first, the chi-square ($\div^2$) test was applied to data collected from both categories of schools, namely, the higher and the lower performing secondary schools academic-ally. The chi-square test was applied to data collected on instructional leadership variables in order to determine the significance of the principal's practice of instructional leadership to school's overall academic performance. The 0.05 level was used as the level of significance (the region for acceptance or rejection of a null hypothesis) for the chi - square test. Then, finally, the contingency coefficient (**C**) was calculated. The purpose of calculating the contingency coefficient was to determine the degree of association (relationship) between instructional leadership and the school's overall academic performance.

3.11 CONCLUSION

The research design discussed in the present chapter included the setting for the empirical research, sampling procedure, research instrument and other information pertinent to it, data analysis method, and the method selected for hypotheses testing. The following chapter presents the results of data analysis, the interpretation thereof, and the hypotheses testing.