

## **CHAPTER THREE**

### **THE METHODOLOGY OF THE INVESTIGATION AND THE DISCUSSION OF THE EMPIRICAL AND STATISTICAL CONSIDERATIONS**

#### **3.1 INTRODUCTION**

In this chapter, a discussion of the research methodology and statistical data collection strategies are explained and justified. The description of the sample, sampling procedures and research methods are also outlined. In the previous chapters, the variables contributing towards the establishment of a culture of teaching and learning have been investigated and explored through the literature review. I find it necessary to investigate the variables contributing towards the establishment of the culture of teaching and learning in high schools through employing the research methods.

In this study, two broad research approaches namely quantitative and qualitative were used in order to attempt to answer the research questions identified. Each research approach has its own advantages and disadvantages and that will be summarised below, even though they play an important role in educational research and other related fields of study. Using both methods is important, in an attempt to provide better understanding and answers of the issues related to the research questions and research problems formulated from the research topic. Based on these methods, the Scheerens' model (1990) as the theoretical framework and literature study investigated in this study will therefore be tested both qualitatively and quantitatively, with an aim of developing a framework specifically focusing on selected variables that can contribute towards the establishment of a culture of teaching and learning in high schools.

##### **3.1.1 QUALITATIVE RESEARCH**

In this study I opted to use a qualitative approach because I wished to obtain a more detailed understanding of the teachers', learners' and parents' experiences, views and problems with regard to variables contributing towards an

establishment of a culture of teaching and learning in the three high schools that participated in the investigation. I was convinced that I would get valid and reliable information which could help me in the suggestion for recommendation as participants were directly involved with school related matters. Furthermore, a qualitative research was selected because it provides opportunities which help in the establishment of a depth of meaning where participants and their views form the focus of this research. Henning, Van Rensburg and Smit (2004:3) see qualitative studies as those “which aim for depth rather than quantity of understanding.” Ezzy (2002:45) sees qualitative methods as those which “identify a person’s understanding of the situation as something to be discovered rather than assumed”, while Mouton and Marais (1993:155) state that they “are those approaches in which the procedures are not as strictly formalized.”

Based on the above, both qualitative and quantitative approaches were chosen for this study in order to get a deeper understanding of the problem under investigation. As Neuman (1997:328) state: “Qualitative report is preferred because of its descriptive nature, colourful details whereby its characters are unique rather than formal and neutral to the statistics.” Mertens (1998:159) writes that “qualitative researches study the phenomenon in its natural state and try to make sense out of it” while Strauss and Corbin (1990:7) describe qualitative research as “any type of research that produces findings or results by not using statistical methods.”

The above opinions stress descriptions of events in a social setting, therefore allowing one to explore in detail the quality of responses and the social as well as behavioural context in which the phenomena occurs. In this qualitative approach, I used both interviews and observations as recommended and described by Fraser (1998:527-564), that “the combination of multiple sources of data and techniques must be used to give a consistent story.” Wathal and Jansen (1997:26) note that “more than one strategy of data collection is very important for conducting research.” Regarding interviews, I prefer to use the standardised interview rather than discursive one, because the former yields strict principles of objectivity and neutrality, producing information that will represent reality. According to Henning, *et al.* (2004:53), the standardised interview is the process

in which “the interviewer has control in order not to let the speaker deviate from the topic.” McMillan and Schumacher (1993:244), on the other hand, see interviews as important because the main purpose of interviewing as a research strategy is to “generate specific individual responses.” In this study interview questions drawn from both literature study and Scheerens’ model (1990) were complemented by observation which will enable me to study in detail the situation and participants’ behaviour. Observation is described in short in the proceeding section (see par. 3.1.2).

### **3.1.2 OBSERVATION**

The observational method of collecting data was also employed in this study, involving “visual and other senses such as hearing, touch or smell” as stated by Bailey (1994:242). Out of two main types of observation, namely participant and non-participant observation, I chose the latter which, according to Robson (1993:190) looks at “the actions and behaviour of people who are a central aspect in virtually any inquiry.” I chose this because it is a flexible technique that allows the observer to concentrate on any variable.

Participants for this study were therefore drawn from three high schools selected purposely from Moretele Area Project Office (APO), where Grade 12 learners, the teachers, parents and school Management teams (SMTs) took part (see the anticipated total number of respondents under par. 1.7 in chapter one). The reason for using purposeful selection is that the three schools were selected according to the previous matric pass rate results over a period of five years. During every visit to Moretele (APO), I observed what happened, writing down everything that happened from the moment I entered, related to different aspects of the school, relevant both to the study’s theoretical framework and literature, see par. 3.2.1.1. Observation in this study was used as a supplementary technique, complementing both questionnaires and interviews; since some participants have a tendency of not being honest. For example, in certain responses they contradict the real situation observed in schools.

During my observation session, for the purpose of this study, I wrote field notes focusing on capturing key phrases and words in their order of occurrences in detail. These collected notes will be used in the proceeding section during data interpretation. Taking notes during observation is therefore important, as emphasized by Maykut and Morehouse (1994:73): “field notes are records of what has been seen and heard by the researcher without interpretation.”

### **3.1.3 QUANTITATIVE APPROACH**

The study is further supported by a quantitative investigation where, according to Anderson, Herr and Nihlen (1994:109) “data aims at confirming theory.” Houser (1998:15) sees quantitative research “as a research that is based on quantification of data.” Henning, *et al.* (2004:3) believe that quantitative inquiry “aims for quantity of understanding”, while Mouton, *et al.* (1993:155) are of the opinion that quantitative approach is the “approach to research in the social sciences that is more highly formalized as well as more exactly defined in terms of the methods used.” In other words, quantitative research is the quantification of data, where respondents’ views are changed into a numeric value. I, therefore, also used a questionnaire consisting of a rating scale for each question (see the table under par. 3.2.1.4). This type of questionnaire is essential as Vockell and Asher (1995:131) state that “there are enough categories to enable the respondents to have a large capacity to discriminate.” All the respondents receive the same set of questions phrased in the same way with an aim of yielding consistently and validity of the study.

Based on the above, I saw it as necessary to employ both qualitative and quantitative methods in this study in order to obtain better results and various opinions. Tashakkori and Teddlie (1998:21) stated that mixed methods can answer questions which either methodologies in isolation cannot. Through employing both quantitative and qualitative methods, a thorough understanding of the research is attempted – in this context the theoretical model of Scheerens (1990) and literature investigated will be tested by both methods.

## **3.2 SAMPLING**

“Sampling”, according to Charles (1998:119), refers to the process of selecting people or things that have been selected as source of data. Vockell (1983:103) refers to it as “strategies, which enable researchers to pick a subgroup from a larger group and then use that subgroup on a larger basis for making judgements about the larger group.” Ary, Jacobs and Razavieh (1985:169) state that “sampling is a small group to be observed, to represent the larger group” while Bless and Higson-Smith (1995:86) see sampling as “the subset of the whole population which is actually investigated by the researcher and whose characteristics will be generalized to the entire population.” Rudduck and McIntyre (1998:47) argue that sampling should “reflect a true representation and reflection of the universe in which the researcher can deduce, infer and generalize the findings of the investigation.” Scott and Usher (1996:55) write that “a sample is drawn from an accessible population”, while Lategan, Vermeulen and Truscott (2003:34) define sampling as “all the elements in the population from which the sample is drawn.” Neuman (2000:98) sees sampling as “a representative sample of a larger population.”

A sample is therefore part of a larger group, and should constitute a representative selection of the whole population. In this context it will be indicated in detail in par. 3.2.1.1 how sampling was conducted with an aim of ensuring validity.

### **3.2.1 THE DESCRIPTION OF THE RESEARCH SAMPLE**

Since the emphasis of this investigation is on the variables contributing towards the establishment of culture of teaching and learning in high schools, I found it necessary to select three high schools in the Northwest Province Moretele area project office, where teachers, learners, principals and SMTs act as the target population. Robinson and Levin (1997:23) reason that “it is not usually possible to deal with the whole of the target population, one must identify that portion of the population to which one can access ... called the accessible population.” Gall, Borg and Gall (1996:134) mention that “not all of the target population can

be accessible, particularly if it is a large population.” Imelda and Muyangwa (2000) state that “research sample is a small group of subjects that possesses the main characteristics of the accessible population.” The accessible population is in most cases influenced by the time and other extraneous variables such as the resources, distance, money and safety. Therefore, the selection of three high schools from the Northwest Province will be cost-effective and represent the population. In the next section a discussion will be based on the sampling procedure applied for selecting three high schools.

### **3.2.1.1 Sample sizes and sampling procedure**

In sampling there are four important procedures that can be followed, namely random sampling, stratified random sampling, cluster sampling and systematic or purposeful sampling. Out of the four sampling procedures, a purposeful selection was preferred in this research because of its good characteristics and representativeness.

Three high schools have therefore been purposefully selected according to the history of pass rate of Grade 12 learners in the final examination over a period of five years, and one school should be that which performed below average, i.e. below 50% and the other one should be above the average of 50%, while the other one should be around 50% with a total number of  $\pm 100$  learners in that Grade 12. A list of all schools with the average of above 50% was obtained and the schools' names were written on pieces of paper, put in a small dish where I randomly selected one school. The same procedure was followed when selecting the school with an average of below 50% and that which is around 50%. This procedure helps because subjects in most cases are equally assigned to a group and this reduces problems of selection and bias.

Regarding the learners, the focus was on the Grade 12's boys and girls together with their parents, SMTs and teachers who are responsible for those grades in those three selected schools. It is expensive and difficult in any research study to engage all the high schools' learners, teachers, SMTs and parents of the province selected as sample population. As Thomas (1998:220) states,

“sampling is a critical component that needs to be done carefully.” I was therefore convinced that the sample population drawn from the three high schools in the Northwest Province represented the entire population of the study, in which the variables contributing towards the establishment of the culture of teaching and learning will be described as this will validate the data collected and findings as the subjects were alike.

### **3.2.1.2 Interviews**

MacMillan and Schumacher (2001:267) define interviews as “flexible, adaptable and involves direct interaction between individuals.” Interviews were also preferred and chosen to be used in this study. A standardised interview is preferred where questions will be asked for collecting data in order to enable me to understand the reasons why the culture of teaching and learning is deteriorating or increasing in high schools. I therefore conducted interviews with the teachers, SMTs and learners of those grades who were going to fill in the questionnaire, so as to make the respondents feel at ease and to obtain minimum bias with maximum participation. The reason parents were not included in the interviews was that in most cases in that area they were not staying with their children, but working far away from their homes and returning only during the weekends or month-end. The other reason for not interviewing the parents is that during the completion of the questionnaires, fewer returned their responses with difficulties. Henning, *et al.* (2004:53) observed such when stating that “guidance without interference from the interviewer is important.” Gubrium and Holskin (2002:9) refer to this as “the mediation of contemporary life.” I was flexible and therefore also accommodated the emergence of unstructured interviews, where questions emerged as the researcher was trying to get a clear understanding of the given information by the respondents. Mertens (1998:323) mentioned that, “Unstructured interviews are formal or informal, whereby the respondents answer freely the questions asked, allowing the expression of feelings during the interviews.” Interviews are important because they strengthen the human relationship, very important for this study as I will be working together with SMTs, learners and teachers.

### 3.2.1.3 The conduction and recording of the interviews

I first constructed interview question items covering different aspects of the variables contributing towards the culture of teaching and learning in high schools. Questions were brief, objective and relevant to the topic, in order to encourage interviewees to be actively involved, as this would help in gathering data to confirm theory. Teachers, SMTs and learners were asked questions derived from the theoretical framework and literature review related to those of the questionnaire, where they were further asked to explain the reasons for the responses (see Appendices 10-11). During the interview session, the interviewer started by briefing the interviewees about the purpose of the interview and also reported to them that a tape recorder would be used to obtain and capture their responses during the process of interviews. The taped information was transcribed and coded. In the process of interviews, their mother tongue (Setswana) was used to clarify certain statements (see Appendices 12-23) and I ensured that participants feel free, have trust and not deviate from the topic under discussion.

The questions drawn or constructed were therefore valid, i.e. they measured what they were supposed to measure. This was in agreement with Ary, *et al.* (1985:357), when arguing that “most obvious type of ensuring validity of questions is that the theoretical assumptions contained in the literature have to be contained in the questionnaires” as this would yield content validity. To support the above, the question items selected, therefore, measured the theory under investigation, and the objectives as they included themes and questions under the following categories: the educators, learners, schools, learning environment and parental involvement, and these emerged from the framework analysis and literature review.

Interviewees first provided me with the biographical information, for example gender, age, highest qualification, home language and medium of instruction as done with the questionnaire, for the demographic characteristics of the interviewees. The biographical information, according to Thomas (1998:162), is based on the assumption that “its categories may be associated with the study’s

target variables.” I selected the above biographical information that was relevant for this study and used in the questionnaires.

**(a) Researcher’s experience**

With regard to the interviews, I encountered problems with School B and that delayed the completion of the data analysis and interpretation. For example on more than two occasions the principal of School B was having important formal school activities which forced me to postpone the interviews until the 30 August, 2004.

When comparing the three schools, I found that in School C the learners appeared not to be relaxed and they also struggled with the use of English as the medium of instruction, and that made me use their mother tongue in certain instances. The aim was to enable the learner to understand and answer the questions easily.

**(b) Process of data analysis**

The final stage in the interviews process is data analysis and this stage is concerned with interpreting data collected. The taped information was given to a member of faculty for validation of interview data. That member of the faculty reduced raw primary data into themes and later to categories which describe the theoretical framework and literature, as stated by Maykut and Morehouse (1994:127) that “themes and categories are not predetermined but emerge from data itself” (see Appendix 12 for examples of coded data).

The data analysis in this qualitative research was done simultaneously in themes with the quantitative one in the proceeding section with an aim of shaping this study as it unfolds.

**3.2.1.4 Construction and content validation of the questionnaire**

According to Gay and Airasian (2000:280), a questionnaire is an instrument that attempts to obtain comparable data from all members of a sample, because the same questions were asked to all research participants. In other words, the

information given by respondents is converted into data and this information makes it possible to measure what respondents think. Based on the above statement, a questionnaire should therefore be brief and easy to be filled in. The table below is part of the format of an example of a questionnaire distributed to three schools (see also Appendices 4, 5 and 6):

Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
1	2	3	4	5

In this study, a structured questionnaire was chosen and constructed in order to also obtain data from the sample population selected. I preferred a close-ended questionnaire which called for brief answers and had been chosen because all the respondents received the same set of questions, and it was easy to score data. The disadvantage of a structured questionnaire is that respondents are restricted to a single phrase and, therefore, I employed standardised interviews in order to combat the disadvantages of the questionnaire. Questions included in the questionnaire were the ones that were related to the topic as mentioned in the previous sections, in order to measure what it was supposed to measure. Keeves and Lamonski (1999:125) refer to this type of measurement as “validity questions.” Therefore, the question items should measure exactly variables under investigation. This is supported by Ary, *et al.* (1985:357) when stating that “in order to ensure validity of questionnaires, the theoretical assumptions contained in the literature have to be contained in the questionnaires.” Three sets of questionnaires were designed as a means of answering the research questions formulated in chapter one. These questionnaires shared the same themes and statements, but they only differed slightly in as much as they addressed different respondents. Based on these ideas I claimed that they were valid as far as content is concerned, and I administered the questionnaire personally with an aim of striving towards the maximum responses.

The validation of research instruments is therefore important for both qualitative and quantitative study during the process of collecting evidence. In this regard, validity in qualitative studies should attempt to cover the scope of the data, by including both objectivity and triangulation in the research, with an aim of

reducing a degree of biasness. In this research, the content validity of the questionnaire used to collect data for this study was verified and accepted by my supervisor and the Department of Statistics of the University of Pretoria, regarding variables contributing towards the culture of teaching and learning in high schools. The verification is important as stated by Vockell and Asher (1995:92) that “it is always an advantage to have someone else to look at the questionnaire” thus justifying validity.

The first section of the questionnaires, (see Section A of both Appendices 4, 5 and 6, questions 1-7), contained the biographical information where the respondents were asked to provide information by marking the appropriate number with an X-symbol in the space provided, such as: gender, age, marital status and highest qualification. Biographical information is important according to my views, because it provides both quantitative data and comparisons within the sample. This is supported by Houser (1998:99) when reporting that “demographic characteristics influence the outcome or dependent variable.” Questionnaires 1, 2 and 3 in Section A of Appendices 4, 5 and 6, i.e. for biographic information used in this study, therefore, ensure content validity.

Regarding Section B of Appendices 4, 5 and 6, 49 question items, 44 question items and 31 questions items were constructed respectively based on the content from chapter one and two regarding variables contributing towards the culture of teaching and learning in high schools.

These questions focused on five main areas from the literature and theoretical framework of the previous two chapters. They are: the role of teachers and School Management Team in the teaching and learning situation, teaching in powerful learning environments, teaching strategies and methods, parental involvement / support, and addition of any information based on the culture of teaching and learning in high schools.

Questions on the roles of teachers and School Management Team in the teaching and learning situation were relevant to *The Government Gazette*

(2000:9-14) and Sharp and Cowie (1998:133), who stated that one of the teacher's role is to establish a strong pastoral system within the school.

Questions dealing with teaching in powerful learning environments were based on the studies obtained from Kniker and Naylor (1986:118), Knowles (2000:287), Harlen and Osborne (1985:266), and Campbell (1991:37) when mentioning that "instruction will be better in a modern well-equipped school than in an old poorly furnished facility."

The information of the questions drawn from teaching strategies and methods is related to the views of Jacobs and Gawe (1996:209), Malan (1997:22) and Steyn, Du Plessis and De Klerk (1998:90), when encouraging participative methods, where productive interaction between the teacher and the pupil is experienced.

With regard to questions on parental involvement / support, relevant information from studies by Borich (1996:83), Morgan (1996:11), Ryna (1994:43-44), Lemmer (2000:61) and Munn (1993:1) maintain that "parental involvement means parents and teachers are working in a close partnership for the benefit of the child."

The last question in all three appendices was asked to allow the respondents to provide more information based on the variables contributing towards a culture of teaching and learning in high schools.

### **3.2.1.5 Statistical procedure applied in the investigation**

When conducting a quantitative study, statistical methods are very important as they allow one to infer from the data's information in order to apply or generalise to the larger population. In this study the Likert Scale Frequency Analysis and ANOVA were used in the questionnaire. The Likert Scale was used because I think that it will assess what it is supposed to assess by asking respondents to show whether they strongly disagree, disagree, uncertain, strongly agree or agree with the formulated statements of the topic. Secondly, I think that when using the Likert Scale, respondents will be highly motivated as it is easy to

complete. This idea is supported by Best and Kahn (1993:231) when mentioning that “the Likert Scale keeps the respondent on the subject and is relatively objective and easy to complete and to tabulate for statistical analysis.” ANOVA was also employed in the study because it measures the analysis of variance through level of significance, where if the results are  $<0.05$ , they are regarded as significant. Fraser (1998:527-564) refers to ANOVA as “common statistical measures of validity in learning environments.” This means that when using ANOVA in the investigation of a phenomenon, there is that likelihood that valid results could be obtained. Frequency analysis was also employed because I believe that it validates, reveals and assesses the influence of variables on the culture of teaching and learning in schools, as a phenomenon in this study.

### **3.3 APPLICATION OF THE QUESTIONNAIRE**

As mentioned above, I visited Moretele area project office in the North-West Province to obtain permission for administering the questionnaires and interviews to learners, teachers, parents and SMTs in three high schools selected purposefully, based on their Grade 12 pass and failure rate above 50%, around 50% and below 50% respectively for a period of five years. In this regard a letter was written and submitted to Moretele area project office (see Appendices 1, 2 and 3). Arrangements were made with the principals of the selected schools to administer the questionnaires and interviews at their school premises. Grade 12 learners were assembled in the school hall and the questionnaires were distributed after they were thoroughly checked in order to avoid confusion during the administering sessions. Before administering the measuring instruments, I bore in mind ethical consideration and explained to the respondents that the information gained from them would be kept in confidence and would not affect or victimize them in any respect. They were also requested to remain at ease while completing the questionnaire. I also read and explained the instructions for each scale, warning the respondents not to discuss their answers with each other. I did not give them my own views about the investigation, aiming at being neutral and also avoiding to be biased, but I intervened only when I had to clarify some statements or questions.

### **3.4 CONCLUSION**

This chapter focused on the discussion of the research instruments, and the procedures to be followed in the data collection, while the chapter to follow discusses data analysis and the interpretation of the research results.

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