INDEX

CHAPTER 2
LITERATURE REVIEW

CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

CHAPTER 4
DATA PRESENTATION AND ANALYSIS

CHAPTER 5
THE SUMMARY OF FINDINGS AND RECOMMENDATIONS

APPENDICES

List of tables

List of figures

CHAPTER 1
ORIENTATION OF THE STUDY

1.1 INTRODUCTION

The inception of the democratic dispensation in South Africa brought with it a paradigm shift in education which necessitated numerous curriculum innovations. This shift has impacted profoundly on the roles of teachers in the classroom, particularly regarding transformation in terms of teaching aims and methodologies. The standard that reinforced the changes required within the new South Africa aims that can reduce the discriminatory attitude between learners and teachers, managers' and those managed; and to substitute the former top-down, ranked and regulatory philosophy of education management with a culture characterised by learner participation and concrete amount of transparency.

Blignaut (2008:101) said: *"In official documents, the so-called 'old' curriculum and the 'new' curriculum are contrasted in a language of binaries: for example, one is teacher-centred, the other learner-centred; one is content-based, the other skills-based".* This premise from a learner-centred curriculum was, and still is a promotion of critical thinking and requires a different kind of teaching from the authoritarian and rote-learning styles of the apartheid years. In the old education system, only the content of the courses and what the teacher or the textbook had to say was important. Learners received information from the teacher and did not play a very active role in the learning situation. Most of their learning was memory based. Learners were seldom given the opportunity to show what they learned and how to use their knowledge. In those days, it was important that learners remembered and repeated everything they learned. Whether they understood or not and whether they were able to use what they had learned in different situations or not, were totally not taken as important (Education Information Centre, 1996).

Changing from a traditional teacher-centred teaching approach requires an upgrade of learners and teachers' resource materials through which learner-centred teaching could be delivered. This assertion confirms the necessity for all schools to have adequate curriculum resources to appropriately sustain teaching and learning. The

minimum standard of one textbook per learner per subject is a policy for the Department of Basic Education in South African schools. The Department of Basic Education (2014) regards and also stresses that study materials are a vital part of curriculum development. Furthermore, the department also indicates that well-resourced classrooms should ideally include learning support materials. These include textbooks for each subject and other print-based materials like readers, atlases, dictionaries, other teaching equipment such as maps, charts, globes and skeletons, as well as equipment and consumable teaching and learning resources essential to the effective running of an education system for different subjects. This declaration embraces a variety of media and formats that are instrumental for teaching and learning as defined by national, provincial and local curricula.

The aim of this research study is to explore the extent to which educators in rural and under-developed schools have transformed their teaching methods in accordance with the demands of a learner-centred curriculum. For example, given the gap that is still evident in terms of resource materials between the former model C schools and traditionally black public schools, this study intends to highlight the shortcomings in the current education system by identifying the inequalities that are not yet addressed by the current government thus far. The study further argues that this gap and overt inequalities that still exist, adversely promote the culture of teacher-centred approach in such under-resourced schools.

1.2 BACKGROUND TO THE STUDY

One of the major challenges that confronted the new self-governing administration that came to power in South Africa in 1994 was to endorse racial impartiality in the national education system. One critical change to be effected was to change the traditional teacher-centred curriculum to one that is outcomes based, particularly in black schools. In order to sustain change, educational context had to reflect the aspirations of the recipients and also gain their trust and respect. Therefore, an appropriate curriculum had to reflect equity and be geared to address the political, social, and economic needs of a democratic society.

One critical ground on which educational innovations can be implemented is the availability of resources needed for the implementation and sustainment of anticipated changes. It means that a well- established educational infrastructure and well skilled and well-qualified teacher workforce are the prerequisites. In the case of South Africa, the researcher argues that educational innovations never took account of the different levels of chaos in which new policies emerged in postcolonial societies. Or, it inadequately accounted for the unequal educational contexts in South Africa. One such context of inequality is that of rural and urban schools. After more than two decades since South Africa gained its democracy, differences still exist between rural and urban schools. This ruled out the feasibility for educators to implement a self-discovery learning and learner-centred approach which is highly dependent on basic resources.

In 1996, when the South African education policy was changed, what remained to be seen was whether there was capacity, will, expertise and resources to implement the introduced changes. This study, therefore, intended to investigate and evaluate the nature of the instructional programmes implemented by educators serving in rural, disadvantaged, and poorly resourced areas. Moreover, it also intended to establish whether teaching and learning in rural schools is consistent with the learner-centred approach.

The researcher's view is that to move from teacher-directed 'one-size-fits-all' instructional strategies towards a learner-centred model, an education system must provide an enabling and conducive learning environment. To this end, Sunzuma, Ndemo, Zinyeka and Zezekwa (2012: 153) emphasized that "it was also established that several obstacles could hinder the implementation of the student-centred methods.

The motive for selecting under-resourced rural schools as the setting of the study was informed by, among other things, the assertions that linked the environmental issues and the quality education possible. This was further meant to confirm that conditions under which learning takes place impact on learning and teaching. The Annual National Assessment (ANA) results (2011) have confirmed the educational gap between the poor schools and the advantaged schools respectively. While ANA

results proved that many schools in South Africa are obviously struggling, the fact that 45% of schools in the poorest quintiles have almost all their learners performing at the 'not achieved' level in grade six mathematics, confirms that rural schools are worse compared to urban schools in terms of teaching strategies. The researcher therefore believes that such the difference should also be traced to the environmental differences. The study focused on rural schools in Dannhauser Circuit.

The researcher contends that a better performance of urban and former model C these are state school in South Africa that used to be for white children only and are now mixed schools. Such schools can be linked to their better educational facilities compared to township schools. Comparatively, most rural and township schools operate without adequate textbooks and up-to-date teaching equipment. Also, factors such as new information technologies, advanced and specialised programmes probably made former model C schools more effective as compared to rural schools. The intention to transform the traditional approach in a South African context was not only to eradicate apartheid practices but to enable South Africa to equally participate in a global economic sphere. Hence, the inequalities that are still evident between former model C schools and most rural and under-developed schools suggest that the competencies of rural educators in rural schools are still restricted by the environment in which they operate. It is for this reason that the study focused on rural schools so as to measure the extent of transformation, if any, towards a learner-centred approach.

The study has to validate the assumptions that link environmental contexts and learners' performance. Moreover, this study had to clearly confirm how the shortage of resources constrains teachers to adopt learner-centred strategies. De la Sablonnie, Taylor, Sadykova and Kyrgyzstan (2009) share similarities with other former Soviet Union countries in terms of challenges associated with education that were manifested after and because of the collapse of the former USSR (Shamatov, 2005; Joldoshalieva & Shamatov, 2007). These problems include insufficient resources for academic institutions, insufficiently qualified colleagues, high rate of student dropouts, constantly changing curriculum, severe lack of textbooks, as well as low salaries with frequent delays and deductions.

Further constraints that restrict transformation imposed by curriculum changes could be drawn from teachers' prior learning and teaching experiences. Several studies concur with the above assertions. Gugushe (2009:1) argues that "*What may have been overlooked is that challenges and successes of curricular reform or revision may also be influenced by challenges to the established identity and role of teachers involved, and that some teachers' perceptions about teaching may be in conflict with the recommended changes or innovations".* This assertion upholds the notion that teachers' past experiences tend to restrict them from complying with the new innovations. Hence, they find it challenging to understand and interpret new policies. It is for such reasons that educators' strategies in the selected schools might reflect their previous experiences. As Lichakane (2005 in Chauraya & Mhlolo 2008) notes, the strategies used by teachers will largely be determined by factors such as available resources, experience of educators' background, and quality of learners. The quality of learners, however, is to some extent the results of strategies used by their teachers. Hence, a symbiotic effect between the teaching strategies and the quality of learners cannot be overlooked.

According to Kasapoglu (2010), the key to successful change is providing assistance to the teachers. However, educational policy-makers focus their attention and energy on the desired educational change and neglect the means of through which anticipated change should be realized. Rogan (2007) regards this as the cause of strong resistance to policy messages and low outcomes due to poor implementation. Hence, the researcher argues capacitating rural school teachers in terms learner-centred strategies and relevant resources should have been the starting point.

Jansen (1998:8) said: "*An entire re-engineering of the education system is required to support the innovation".* The implication therefore was teachers as the foot soldiers and the implementing agents of aspired transformation should have been retrained in accordance with the demands of the newly introduced curriculum needs. Ironically, such volatile changes in most cases had to be supervised and implemented by the very educators who are not adequately prepared and therefore not conversant with them. Consequently, they found it difficult to do so. Faced with the significance of their role as agents of change, many educators, head-teachers,

senior education managers as well as directors up to the superintendent general level are suffering from innovation overload (Sayed & Jansen, 2001:180). Makhwathana (2007:8) posits that " *Insufficient time to adapt to the changes confuses the educators. Sometimes they try to do the right things in a wrong way. For that matter they also bring confusion and erode professional competencies amongst educators across the entire teaching personnel"*. Similarly, De la Sablonnie, Taylor, Sadykova (2009:7) argue that *"To achieve successful social change in terms of education, there are two necessary steps in order to maximize the likelihood of constructive change in education. First, a student-centred approach needs to be clearly and simply articulated. Second, mechanisms are needed that allow for every stakeholder in the education process to be fully informed about the processes arising from educational reform".*

As this study focuses on the rural schools, the intention was also to establish and assess the type of training educators have received and continue to receive to prepare and empower them for the new innovations, such learner-centred teaching, which they did not receive in the institution from where they were trained. Given the setting of the study, the selected schools lack resources which could enable their educators and learners to implement a learner-centred approach. The fact that selected schools are graded as lower quintile schools, hence no-fee schools, reveals the poverty level of their communities. Their environmental inconveniences deprive them opportunities that are available in developed areas.

1.3 RESEARCH PROBLEM

The historical background of South Africa, particularly in historically black schools, poses a serious threat in adopting a learner-centred approach. Given the apartheid policy of screwed educational supply, black and rural schools were not prioritised in terms of resource provision. They were left to be less prepared to adopt and implement a learner-centred teaching as the quality of black teachers was too inferior as compared to their white counterparts. Consequently, the use of the teacher-centred approach is still a serious challenge in South African under-resourced schools, which is a serious concern. The challenge is that it is critically important to discard this traditional teacher-centred approach in favour of a widely

advocated learner-centred approach. Research has consistently demonstrated that the learner-centred teaching practices are more effective than the traditional teacher-centred approaches (Weimer, 2013). However, changing from the teacher-centred approach requires particular conditions upon which learner-centred approach can be implemented. One such requirement is the provision of adequate resources for teaching and learning, which is not the case in Dannhauser Circuit. Another requirement is the teachers' knowledge of implementing a learner-centred approach.

In Dannhauser Circuit, teachers find it difficult to implement the learner-centred approach because they are not properly trained to use inquiry-based approaches. This state of affairs affects teaching in a negative way, particularly the teaching of science subjects such as Physical Science. In this research study, the researcher argues that the inability of rural schools to adopt a learner-centred approach deprives learners from such communities of one of the fundamental human right which is quality education based on inquiry-based and problem-solving teaching approaches. The underlying research problem of this study, therefore, was to investigate the challenges faced by rural and disadvantaged schools as a result of teacher-centred method which dominates teaching in such schools.

1.3.1 Research questions

Against the given background above, this study intends to address the following main research questions:

- How do educators in rural and underdeveloped schools cope with a learner-centred approach as part of the curriculum innovation?
- Why do rural schools struggle to recruit and retain scarce subject teachers?

The following sub-questions are meant to further clarify the nature of an instructional programme taking place in the selected school might be provided.

- How does lack of resources affect the implementation of a learner-centred approach in underdeveloped schools?

- How do the rural and underdeveloped rural conditions affect the implementation of learner-centred approach?
- How do educators' prior knowledge and their experiences impede their participation in the new curriculum developments?

1.4 MOTIVATION

The significance of this study should be understood as a contribution towards the realization of one of the millennium developmental goals (MDGs). One such goal is developing all aspects of education. In the South African context, the determination is to lure the attention of education providers to the gaps that are still deflating the developments made in addressing educational challenges since the emergence of democracy. This study intends to detect challenges that exclusively affect rural schools.

Furthermore, this study intended to address the argument which refers to difference between rural and urban schools as just political. An informed response should note whether equity in terms of resources and other facilities between rural and urban schools has been attained in South African schools. In addition, this research study attempted to highlight the persistent impact of the skewed policy of resource supply applied by the apartheid regime and, finally, to unveil the plight and the challenges faced by the educators serving in the rural schools and how to deal with them.

1.5 AIMS AND OBJECTIVES OF THE STUDY

The main purpose of this study is to determine and evaluate whether educators in rural and underdeveloped schools manage to cope with the requirements of learner-centred teaching approach in line with the requirements of the current South African curriculum, particularly in the teaching of Physical Science, Grade 10-12. In addition, the study is also intended to endorse the effectiveness of using a learner-centred approach by postulating the advantages associated with learner-centred approach. The preference of this approach is informed by numerous advantages associated with it. Hence, de la Sablonnie, Taylor and Sadykova (2007:3) have

stressed that *"According to researchers in the field of education, there is evidence to support the view that a student-centred approach has positive consequences to learning".* One notable advantage of this new approach is that it encourages learners to make their own decisions and even inquire more in learning.

1.5.1 Objectives

The objectives of this study are as follows:

- To determine the requisite of resource materials in the implementation of a learner-centred approach;
- To determine how educators' prior knowledge and experiences affect their abilities to conform to new innovations;
- To assess the relevance of support, if any, that rural educators get to assist them to comply with new curriculum developments; and
- To determine exclusive rural challenges stifling the adoption and implementation of learner-centred approach.

1.6 RESEARCH APPROACH

The study adopted qualitative research methods. Qualitative research generally attempts to understand the issues from the viewpoints of the participants (Bryman, 1988). Since the participants in this study were educators, learners and the School Management Team (SMT), the researcher attempted to see through the eyes of the participants (Struwig & Stead, 2007). A qualitative research method is characterized by its natural setting. Bhattacharya (2008) refers to the research setting as the physical, social, and cultural site in which the researcher conducts the study. For this study, the setting was, therefore, rural schools in Dannhauser Circuit. The qualitative approach maintains that the circumstantial setting is vital in grasping behaviour, and that social activities are strongly influenced by the setting in which they take place. The participants of the study (teachers, learners and members of

the school management teams (SMTs)) were observed engaging in teaching and learning activities. By describing the social setting of the participants, the researcher attempted to ensure that their views are not isolated from their context.

As an educator in one of the schools in the same circuit where the selected schools are situated, the researcher was able to directly observe and interview the participants and attended departmental workshops where curricular issues were discussed. Also, the researcher was able to spend considerable time in direct interaction with the settings, the participants and the documents to be studied and analysed. Qualitative research encompasses process orientation; it wants to know why and how the behaviour occurs. The behaviour in this regard was how effective teaching without basic resources took place, and why learners perform more poorly than those who have resources. The study tried to understand how teachers' self-esteem and teaching methods become affected by the lack of resources. When conducting this study all details were observed and recorded as they occurred naturally in their actual contexts. This in turn provided the researcher with a complete understanding of both the setting and the behaviours. This involved all formal and informal interactions within the schools as well as curricular and core-curricular activities. This was in compliance with rich narrative descriptions of a qualitative study.

While attempts were made to investigate all factors that might provide explanations for the problems under investigation, admissions were made essential to the belief that the world is complex and there are many clarifications for human behaviour. Qualitative researchers admit that it is not always possible to account for all the complexities present in a situation. Since one of the main objectives of this research study was to investigate the use of the learner-centred approach, the purpose was for the researcher to ascertain the extent to which a learner-centred teaching approach is possible in the absence of relevant resource materials. And, to determine how the selected schools' performances are affected by the way in which teaching and learning are conducted.

1.7 REASONS FOR USING QUALITATIVE RESEARCH APPROACH

De Vos, Strydom, Fouche, and Delport (2007) provided the following guidelines on situations where the qualitative approach would be a preferred one:

- Research that cannot be done experimentally for practical or ethical reasons;
- Research that delves in depth into complexity and process;
- Research for which relevant variables have yet to be identified;
- Research that seeks to explore where and why policy, folk wisdom and practices do not work;
- Research on unknown societies or innovation systems;
- Research on informal and unstructured linkages and processes in organisations;
- Research on real as opposed to stated organizational goals.

The above guidelines seem to be quite relevant for the current education in South Africa. The new curriculum, National Curriculum Statement (NCS), and its instability due to numerous changes it has gone through, have been ineffective. As a result, it has been phased out in favour of Curriculum Assessment Policy Statement (CAPS) of whose effectiveness is yet to be seen. The study is also based in schools located in a rural area where service delivery is lagging behind, and where such societies believe their needs are not fully understood by their government and thus are not prioritised. This study has attempted to clarify what quality education entails. This was partially informed by the poor performance in Mathematics and Literacy as shown, *inter alia*, by ANA results in 2011. While the two subjects are the basis and the tools for learning within the OBE system, learners have failed to acquire literacy and numeracy skills. Gultig, Hoadley and Jansen (2005:78) argue that *"introducing a new curriculum in the context of extreme shortages of resources such as curriculum materials have affected the implementation of OBE negatively*". This could be the reason why literacy and numeracy skills have taken a 'nose-dive' since the introduction of the OBE.

The study was intended to examine and describe the meanings of existing practices, in particular, the use of learner-centred approach. The focus had been to investigate the practices of teachers and learners in a school situation engaged in the instructional function without the supporting resources. The practices were then changed into a description of its essence allowing for reflection and analysis. When facts were collected on how the learners and teachers make sense of their situation, all predispositions were put aside and the interpretations were based purely on what was gathered.

1.8 RESEARCH DESIGN

A research design is a plan that describes the conditions and procedures for conducting the study including when, from whom and under what conditions the data will be obtained (McMillan & Schumacher, 2010). Lester (2004:1) states that *"phenomenology is concerned with the study of experience from the perspective of the individual, 'bracketing' taken-for-granted assumptions and usual ways of perceiving".* As the study was aimed at evaluating the extent to which educators in rural schools have managed to apply the learner-centred approach, a phenomenological design was perfectly appropriate to describe the experiences of the participants from their own perspectives. Hence, Welman and Kruger (1999:189) noted that "*the phenomenologists are concerned with understanding social and psychological phenomena from the perspectives of people involved*". It is for this reason that the setting and the focus of the study were the educators and learners from the rural schools.

For the researcher, phenomenological approach became relevant at extracting and revealing profound issues that affect rural education and learner-centred teaching. This is in agreement with the motivation of conducting this study, that of making a clarion call to education providers and to reveal the challenges faced by the schools and educators in rural and underdeveloped communities. Lester (2004) has noted that it is not always comfortable for clients or funders, particularly when the research exposes taken-for-granted assumptions or challenges a comfortable *status quo*. For those who hold the notion that the difference between rural and urban schools is just political, they will find it embarrassing when confronted by the fact

that after more than two decades of democracy in South Africa, the gap between the rural and the former model C schools is still wide open. By stressing that, many organisations value the insights which a phenomenological approach can bring in terms of cutting through taken-for-granted assumptions, prompting action or challenging complacency. The other intention of this study was to elicit action from the education providers by focusing on the need for more support to rural schools so as to implement learner-centredness as a teaching strategy.

1.9 DATA COLLECTION

The aim of the phenomenological approach is to detect the phenomena through how they are actualized by the participants in a context. In the human domain this usually translates into collecting extensive data and insights through inductive, qualitative methods such as interviews, discussions and participant observation, and representing it from the perspective of the research contributors. In this study, however, data were collected through interviews.

1.9.1 The interviews

Gill, Stewart, Treasurer and Chadwick (2008:192) believe "*that qualitative methods, such as interviews, are believed to provide a 'deeper' understanding of social phenomena than would be obtained from purely quantitative methods, such as questionnaires".* On the other hand, Englander (2012:34) states that "*Interviewing in descriptive phenomenological human scientific research should be seen as a specific mode of data gathering that is integrally related to the research process as a whole"*. As in every qualitative study, interviews are regarded as the primary data collection strategy because in this study the researcher designed the interview questions such that the aims and objectives of the research could be fully addressed.

In order to glean as much information as possible, structured, semi-structured and unstructured interviews were used. The selection of interview strategy and forms depended on the context. The semi-structured interviews were used primarily to explore with the participants their views, beliefs, attitudes and experiences about the

nature of teaching and learning that is taking place in their schools. For the interview guide approach, topics are selected in advance. A structured interview is characterized by its structured format in that questions are detailed and developed in advance and are asked in a rather structured manner (Niewenhuis as in Maree, 2008). This type of interview enabled the researcher to target those issues which they were purposefully planned to cover. These were also intended for the information-rich participants. Unstructured interviews were considered where significant 'depth' was required, or where virtually nothing was known about the subject area or a different perspective of a known subject area is required.

1.9.2 Focus groups

Focus groups were used for generating information on shared views, and the connotations that lie behind those views. Gill, et al. (2008) maintains that focus groups are also useful in generating a rich understanding of participants' experiences and beliefs. Suhonen (2009: xii) posits that “A common approach in focus interviews is to *invite a group of experts to discuss about the research topic*”. In this study, the researcher started by inviting all Physical Science educators in each school and asked them to discuss their experiences and challenges in implementing a learner-centred approach. Thereafter, HoDs were decisively and individually interviewed on the basis of their potential of providing more information on the topic. This pattern is suggested by Kreuger (1988) by mentioning that focus groups can be used at the preliminary or exploratory stages of a study. As explained above, in this study, focus groups were preceded individual interviews.

1.9.3 Observations

Data were also collected through intensive observation. During and after my observation the researcher took field notes on what he saw and heard and sometimes had to reflect on his own limitations on implementing learner-centred teaching strategies. As part from the observation, the researcher also had to conduct class visits and observe the extent, if any, to which educators in the selected schools applied learner-centred strategies. Suhonen (2009: xiv) remarks that Taylor-Power and Steele (1996) suggested that seeing and listening are the key aspects of direct

observation. The method provides the opportunity to collect such data that, for instance, might be difficult to retrieve via questionnaires or interviews. In some cases, behaviour of the people can also be recorded with a video camera. Kawlich (2005) believes that the goal for the design of research using participant observation as a method is to develop a holistic understanding of the phenomenon under study that is as objective and accurate as possible given the limitations of the method.

Kawlich (2005) further posited that observations enable the researcher to describe existing situations using the five senses, providing a 'written photograph' of the situation under study. Hence, observation played a significant role in the researcher's intention of unlocking the limitations of implementing curriculum innovations in rural schools.

1.9.4 Documents analysis

Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic. Also, The Student Voice website (2010) maintains that documents can help reconstruct events, and give information about social relationships. Given the setting of the study, whereby South Africa is a classic example of an unequal society, the selection of a rural community was intended to reveal inequality in terms of education provision. Bowen (2009) highlighted that document analysis is a systematic procedure for reviewing or evaluating documents - both printed and electronic (computer-based and internet-transmitted) material. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge. Hence, the researcher's intention was to view and analyse all relevant documents that can reveal the quality of teaching strategies so as to evaluate their consistency with the curriculum innovations. For this study the documents used included the following:

- Log books: These revealed the comments written by the subject advisors who visited the school;

- Educators and learners' portfolios: These showed learners' performance in the selected subject; and
- Lesson preparations: These showed how Physical Science educators plan their lessons and which resources they use to prompt learner-centred teaching.

Over and above the stated documents, other documents, like minute books, mark lists that surfaced during the interviews were also used for analysis. These documents provided information on how the schools implement their instructional programmes, the challenges and teaching methods the participants used to teach. The records from learners and educators' portfolios provided information on the performance of learners and the comments from the subject advisors. These suggested the effectiveness or the challenges of implementing a resource-dependent curriculum in schools where there is a shortage of resources which are critical for learner-centred teaching.

1.10 DATA ANALYSIS

Groenewald (2004) warns that data analysis is deliberately avoided in phenomenology because Hycner (1999) cautions that 'analysis' has dangerous connotations for phenomenology. The term [analysis] usually means a 'breaking into parts' and therefore often means a loss of the whole phenomenon, whereas 'explicitation' implies an investigation of the constituents of a phenomenon while keeping the context of the whole. Coffey and Atkinson (1996) regard analysis as the systematic procedures to identify essential features and relationships. It is a way of transforming the data through interpretation. For this study, the researcher therefore used a simplified version of Hycner's (1999) explicitation process. Hence, in line with phenomenological data analysis, the five phases of the explicitation process were used:

(i) Bracketing and phenomenological reduction

Holloway and Hycner (1999) endorse that the researcher listens recurrently to the audio recording of each interview until the exclusive experiences of research participants become familiar in order to develop an all-inclusive sense, the 'gestalt'. Zinker (1978:15) explains that the term 'phenomenological' implies a process, which emphasises the "the here and now" dimensions of those personal experiences gives phenomena existential immediacy.

(ii) Delineating units of meaning

This is a critical stage of explaining the data in that those statements that are seen to illuminate the researched phenomenon are removed or 'isolated' (Creswell, 1998; Holloway, 1997; Hycner, 1999). This is where a considerable number of judgment calls were made while deliberately bracketing my own assumptions in order to avoid unsuitable personal decisions.

In this step the list of units of relevant meaning were therefore extracted from each interview and carefully scrutinised while eliminating redundant parts. This was done by considering the literal content, the number (the significance) of times a meaning was mentioned and also how non-verbal or para-linguistic cues were stated.

(iii) Clustering of units of meaning to form themes

In this regard an effort was made to elicit the essence of the meaning of units within the holistic context. Hycner (1999) remarked that this calls for even more judgment and dexterity on the part of the researcher. This calls for:

- forming clusters of themes by grouping units of meaning together.
- identifying significant topics or units of significance.
- determining central themes by interrogating various clusters.

(iv) Summarising each interview, authenticating it and where necessary adjusting it to give a holistic context

A summary that incorporates all the themes elicited from the data will be made (Hycner, 1999). At this point, the researcher conducts a validity check by returning to the informant to determine if the essence of the interview has been correctly captured. Necessary modifications were then made.

(v) Extracting general and unique themes from all the interviews and making a composite summary

Once the process outlined in points 1 through 4 has been done for all the interviews, the researcher looked for the themes common to most or all of the interviews as well as the individual variations.

It was at this stage that a composite summary was accumulated. This reflected the context from which the themes emerged. At this point, participants' expressions were transformed into expressions appropriate to the discourse supporting the topic.

1.11 SAMPLING

A purposeful sampling strategy was used. McMillan and Schumacher (2010) define purposeful sampling as a type of sampling that allows choosing small groups or individuals who are likely to be knowledgeable and informative about the phenomenon of interest, selecting cases without needing or desiring to generalise to all such cases.

For this study, schools and participants were selected on the basis of their ability to contribute to the development of the theory. The setting of this study was the secondary schools in a rural and underdeveloped area (Dannhauser Circuit). Also, in line with a theory/concept sampling strategy, the participants were the Physical Science educators and Grade 10 to 12 learners who were doing Physical Science. The reason for choosing Physical Science was because it is perceived to be one of the most resources-reliant subjects. Therefore, the sample size consisted of a total of six schools:

- Three Physical Science educators from each school;

- Three learners from each school; and
- One Physical Science HoD from each school.

1.12 DIVISION OF CHAPTERS

CHAPTER 1: BACKGROUND, PROBLEM FORMULATION AND AIMS

This chapter deals with the introduction and the background of the study. It further deals with the formulation of the problem and the problem statement of the study. The aims and objectives as well as the motivation of conducting the study are also discussed. This chapter also introduces the research questions and the methodological issues.

CHAPTER 2: LITERATURE REVIEW

This chapter focuses on a review of the literature related to the learner-centred approach as a teaching strategy. It begins with a detailed conceptualization of the concept of learner-centred teaching by looking at the definitions, purposes and other implications related to learner-centred teaching. It further explores the benefits and other related advantages drawn from learner-centred strategies. Thereafter, it examines the challenges and contextual factors which stifle the adoption of a learner-centred approach and other curriculum innovations introduced in the post-democratic South Africa.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

This chapter focuses on the description of the research design and the methodology used to investigate the research question on which the study is based. Research methods and reasons for selecting such methods are also discussed.

CHAPTER 4: DATA PRESENTATION AND ANALYSIS

This chapter provides an analysis and the interpretation of the qualitative data collected by means of the research techniques discussed in Chapter Three. Finally, it analyses the findings and the outcomes reached.

CHAPTER 5: SUMMARY OF FINDINGS AND RECOMMENDATIONS.

This chapter presents a summary of the study findings, recommendations, the conclusions, as well as the areas for further research.

1.13 DEFINITION OF TERMS AND CONCEPTS

Resource materials: According to the Oxford (South African) Concise Dictionary (2010:1006), resource means a stock or supply of materials or assets and 'materials' denoting or consisting of physical objects rather than the mind or spirit. In the context of the study 'resource materials' refer to the teaching aids or the physical tools to support teaching and learning in a school.

Learner-centred: This refers to an approach to education focusing on the needs of the student rather than of those involved in the education processes, such as educators and administrators. For this study, this was used synonymously with self-discovery learning. The emphasis was on the learning whereby students actively participate in discovery learning processes from an autonomous viewpoint, whereby they are allowed to construct a new understanding of the material being learned without being passive but proactive.

Quintile: The Oxford South African Concise Dictionary (2010:968) defines a 'quintile' as "statistics each of five equal groups into which a population can be divided according to the distribution of values of a variable". For this study, 'quintile' refers to a framework used by the Department of Basic Education to categorize schools in terms of the level of education and the level of unemployment rates of the communities around the school, the lower quintiles 1 & 2 being the most deserving in terms of funding.

Curriculum: The term 'curriculum' is often used to refer to the formal academic programme provided by a school as reflected in subjects on the time-table. In this sense, it might also be used to refer to a particular course of instruction or a syllabus (Gultig, et al. 2002:21).

Outcomes-Based Education: This is a learner-centred, result-oriented approach to education and training that builds on the notion that all learners need to and can achieve their full potential, but that this may not happen in the same way or within the same period (Northern Province Department of Basic Education, 2000:2).

Under resourced: This refers to the lack of resources for normal operations.

Rural: relating to the country and the people who live there instead of the city.

Underdeveloped: Having a low level of economic productivity and technological sophistication within the contemporary range of possibility.

1.14 CONCLUSION

The first chapter discussed the outline of the study. The purpose of the research is to determine the extent to which learner-centred teaching has been adopted and implemented in the rural schools of Dannhauser Circuit. The chapter defined the problem statement, the aims of the research and the significance of the study. This was followed by a definition of concepts and a brief overview of the research design and data collection methods.

Chapter two will focus on a review of the literature related to the learner-centred approach as a teaching approach. It will further explore the benefits and other related advantages drawn from learner-centred strategies. Thereafter, it will examine the challenges and contextual factors which stifle the adoption of a learner-centred approach and other curriculum innovations introduced in the post-democratic South Africa.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

Creswell (2008:116) says that *"a literature review is a written summary of articles, books, and other documents that describes the past and current state of knowledge about a topic, organizes a literature into topics, and documents a need for a proposed study".* The literature review in this study aims at finding out what has been researched on learner-centred teaching globally and in South Africa in particular.

This chapter focuses on a review of the literature related to the learner-centred approach as a teaching strategy. It begins with a detailed conceptualization of the concept of 'learner centred teaching' by looking at the definitions, purposes and other implications related to learner-centred teaching. It further explores the benefits and other related advantages drawn from learner-centred strategies. Thereafter, it examines the challenges and contextual factors which stifle the adoption of a learner-centred approach and other curriculum innovations introduced in the post democratic South Africa. This chapter will also look at educational theories associated with learner-centred pedagogy. Furthermore, it will look at the environmental factors that influence teaching and learning in the selected rural schools. Finally, the review of literature will identify gaps in the respective knowledge that exists today.

2.2 THE CONCEPTUALISATION AND THE DEFINITIONS OF LEARNER-CENTRED TEACHING

The researcher considers the conceptualization and definition of learner-centred teaching as both convoluted and somehow argumentative. This is due to the fact that learner-centredness complies with various approaches that encompass an active role of learners in their learning. Hence, Min Liu (2003:57) says: "*A variety of approaches fit beneath the umbrella of student-centred-learning".* A common thread which runs through learner-centred teaching is the emphasis on a variety of different types of

methods that shift the role of the instructors from givers of information to facilitating student learning.

These methods may include everything from listening practices that help students to absorb what they hear to short writing exercises in which students react to the material, to complex group exercises in which students apply course material to real life situations and/or to new problems. While listening and taking notes are considered as the cornerstones of traditional teacher-centred learning, Alemu (2010:14) argues that, "*In this approach students may also be actively involved by means of discovering, processing, and applying information"*. However, Starke (2007:4) says that "*Learning is not a spectator sport. Students do not learn much just by sitting in class and listening to teachers, memorizing pre-packaged assignments, and spitting out answers".*

However, the focus of this study is to evaluate learner-centred teaching as part of curriculum delivery. Therefore, the actual focus is to determine and evaluate how teachers in the selected schools attempt to implement learner-centred teaching. The researcher's argument is that the methods used to teach learners determine how they learn. Therefore, the techniques through which learners absorb knowledge are informed by how they are directed. Sunzuma, et. al. (2012:147) argues that, *"Besides providing appropriate problem-rich situations, teachers must encourage students to find their own solutions"*.

The researcher's determination is that teachers should always provide a variety of opportunities that will cater for learners' diversity, an appropriate blend of teaching and that learning resource materials should be provided. This resonates with Manqele (2012) when asserting that the constantly changing curriculum in South Africa suggests that the provision of educational resources should match the demands of every approach required for the implementation of the newly introduced curriculum.

Abbott, Guisbond, Levy and Sommerfeld (2012:1) say: "the term student-centred learning refers to a wide variety of educational programmes, learning experiences, instructional approaches, and academic-support strategies that are intended to

address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students and groups of students". This, according to the researcher, creates a room of confusion in terms of identifying what approaches are genuinely learner-centred and those which are not. This confusion is exemplified by terms like active learning, student engagement and other strategies that involve students and mention learning being tagged as learner-centred. Although learner-centred teaching and efforts to involve students have a kind of bread and butter relationship, they are not the same thing. In the interest of more definitional precision, Weimer (2012) proposed the following five characteristics of learner-centred teaching:

- Learner-centred teaching engages students in the hard, messy work of learning;
- Includes explicit skill instruction;
- Encourages students to reflect on what they are learning and how they are learning it;
- Motivates students by giving them some control over learning processes; and
- Encourages collaboration.

In contrast, Gibbs (1997) offered a useful definition of learner-centred learning. He states that learner-centred learning gives learners greater autonomy and control over choice of subject matter, learning methods and pace of study. This definition unties the aspect of learner-centred pedagogy that promotes a freedom of choice. This implies that learners' preferences in a learner-centred pedagogy should always be considered. Furthermore, this actually explains how the new South African democracy opted for learner-centred pedagogy in order to support and sustain its new-found freedom.

Another perspective of a learner-centred education focuses on individual learners' heredity, experiences, perspectives, background, talents, interests, capabilities and needs. Therefore, it is all-inclusive as it aims to empower all learners irrespective of their differences. The researcher maintains that one basic benefit of learner-centred education is that it caters for the personal needs, abilities, and learning

styles of individual learners. Therefore, learners cannot just listen and take notes as in a teacher-centred learning; instead they should participate in a variety of class activities, and interact with one another. This ensures that learners are involved in higher-order thinking skills like analysing, synthesizing, and evaluating. This type of learning enables learners to reflect on their learning and their learning processes.

However, given the implied indistinctness, ambiguity and possible confusion linked to the definition of learner-centred education, this study is accommodative of various labels that were related to the expectations linked to the changes sought by the paradigm shift in South African education. Hence, Carlile and Jordan (2000), in Al-Mekhlafi and Nagaratnam (2012) maintain that there seems to be, however, no single theoretical basis for student-centred learning in the literature. It appears to relate primarily to the 'constructivist' view of learning in the importance it places on activity, discovery and independent learning. Emes, Cleveland- Innes and Martha (2003:11) conclude that "*definitions are based on practice and ways of teaching in the classroom and focus on the conditions under which learner-centredness occurs".*

2.2.1 The basic definitions

Despite these definitional complications, Mascolo (2009:16) articulated that *"although there is some lack of consensus about the meanings of these terms, and although these modes of learning overlap, it is possible to offer some basic definitions*". The following are some of the basic definitions he worked out:

Problem-based or inquiry learning: consists of learning activities in which groups of students collaborate in an attempt to solve particular problems. Problem solving requires a variety of different sub-skills that can be coordinated through goal-directed collaboration among students. Problem-based learning is often used in classes that lend themselves to laboratory or small group work, but has also been adapted for large classrooms (Oliver, 2007).

Experiential learning: refers to a mode of learning in which students construct knowledge and skills through direct action, experience and reflection (Estes, 2004). From this view, the role of an educator is to provide the experiences from which

learning can occur through active reflection. Experiential learning has its origins in Dewey's (1938) inquiry-based approach to learning. Although experiential learning is often practised in applied community settings, such as internships, community service and field work, it can also be used in classroom settings (Wurdinger, 2005).

Participative learning: involves providing students with the opportunity to play an active role in the structure and content of courses and learning activities. In collaboration with a teacher, students may be involved in the design of course syllabi, identifying course assignments, creating student assessment devices, and even grading (Simkin, 2005; Wingfield & Black, 2005).

Collaborative learning: denotes a goal-directed learning that occurs in small groups of students (O'Donnell, Hmelo Silver & Erkens, 2005). These forms of learning are sometimes called peer-assisted learning, group learning, peer-tutoring, and other terms.

Cooperative learning: is a special form of collaborative learning that is generally defined in opposition to competitive or individualistic learning (Johnson & Johnson, 1990). Competitive learning occurs when individuals or groups must work in opposition to each other; individual learning simply consists of learning by one's self, often in a competitive context. In contrast, cooperative learning is deliberately organised through an interdependent structure in which group members must rely upon one another to perform particular learning tasks. An important tenet of cooperative learning is the notion of intentional design (Barkley, Cross & Major, 2005).

In conclusion, the researcher opted to draw a simple explanation by alluding to Min Liu (2003) who characterised student-centred approaches as defined by contrasting them with traditional instructional approaches which are characterised by greater teacher direction. Key differences between the two approaches include goals, roles, motivational orientations, assessments, and student interactions. In addition, the researcher notes that the difference between the two approaches lies on how learners construct information. In teacher-centred learning learners are not actively

involved in knowledge construction while in a learner-centred learning learners are directly involved in the construction of knowledge.

2.3 THE THEORETICAL FOUNDATIONS OF LEARNER-CENTRED TEACHING PRACTICE

Ormond (2012) posits that learning theories are conceptual frameworks that describe how information is absorbed, processed, and retained during learning. The researcher further maintains that there are three main categories or philosophical frameworks under which learning theories fall: behaviourism, cognitivism, and constructivism. Behaviourism focuses only on the objectively observable aspects of learning. Cognitive theories look beyond behaviour to explain brain-based learning and constructivism views learning as a process in which the learner actively constructs or builds new ideas or concepts.

Constructivism is not a particular pedagogy but a theory based on observation and scientific study about how people learn. However, the fact that it postulates that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences puts it in line with pedagogic approaches that promote active learning, or learning by doing. Therefore, between the two pedagogical approaches, namely; teacher-centredness and learner-centredness, it is the latter which encourages learners to use active techniques (experiments, real-world problem solving) to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing.

Bucci, Copenhaver, Lehman and O'Brien (2003) pointed out that the combined research of Piaget, Vygotsky, Dewey, and Bruner supports learning environments and activities that are developed to allow for whole to-part learning with big ideas, pursuit of student questions, use of manipulative materials, and the viewing of students as thinkers who are emerging at different rates. There is a plethora of research connecting instructional design to positions on constructivist learning (Ertmer & Newby, 1993). If instructors hold the constructivist orientation of learning,

they are more likely to create learning environments that provide opportunities for students to create or construct knowledge.

The formalization of the theory of constructivism is generally attributed to Jean Piaget, who articulated mechanisms by which knowledge is internalized by learners. For Piaget, the theory of constructivism suggests that learners construct knowledge out of their experiences. However, from the researcher's experience and understanding, all forms of learner-centred approaches as implemented in a classroom context, are best portrayed and characterised by Vigotsky's (1978) theory of the socio-cultural-constructivist approach. Although both the Piagetian and Vygotskian approaches advocate instruction that lies beyond the student's current level of development, Vygotsky (1978) draws upon the idea that students operate at higher levels of development when they work with more expert individuals than when they operate alone (or with peers). Within the Piagetian (1973) approach, the student can rely only on his actions and reflections (or the disequilibria provided by peers) to move his thinking to a higher level; from a Vygotskian (1978) viewpoint, interactions with a more accomplished other not only pull the student's thinking higher than he can sustain alone, but also in the direction defined by disciplinary knowledge and conventions.

In all practical intents, Vygotsky's (1978) socio-cultural-constructivist approaches maintain the significant role that the teacher has to play in the teaching and learning context. Hence, Mascolo (2009:14) embraces the fact that *"both students and teachers must be active in the learning process, both in and out of the classroom".* Mascolo (2009) rejects the conceptions of teachers as mere facilitators or coaches whose function is to support a student's active attempts to discover and reconstruct knowledge through his/her own actions. He concludes that such conception relinquishes the central role of teachers in the pedagogical process. To qualify his assertion, Mascolo (2009) makes reference to Vygotsky's (1978) concept of the zone of proximal development. Vygotsky (1978) maintained that there is a difference between the developmental level at which a child can function when working on her own and the level that she can sustain while working with an adult or more accomplished peer. Vygotsky (1978) referred to the distance between these two levels as the zone of proximal development. Mascolo (2009:7) posits that *"A child*

cannot ordinarily create the zone of proximal development himself; he needs the more expert individual to bridge the gap between his current developmental level and his proximal level of development."

2.3.1 A prototype of a constructivist based learner-centred teaching practice

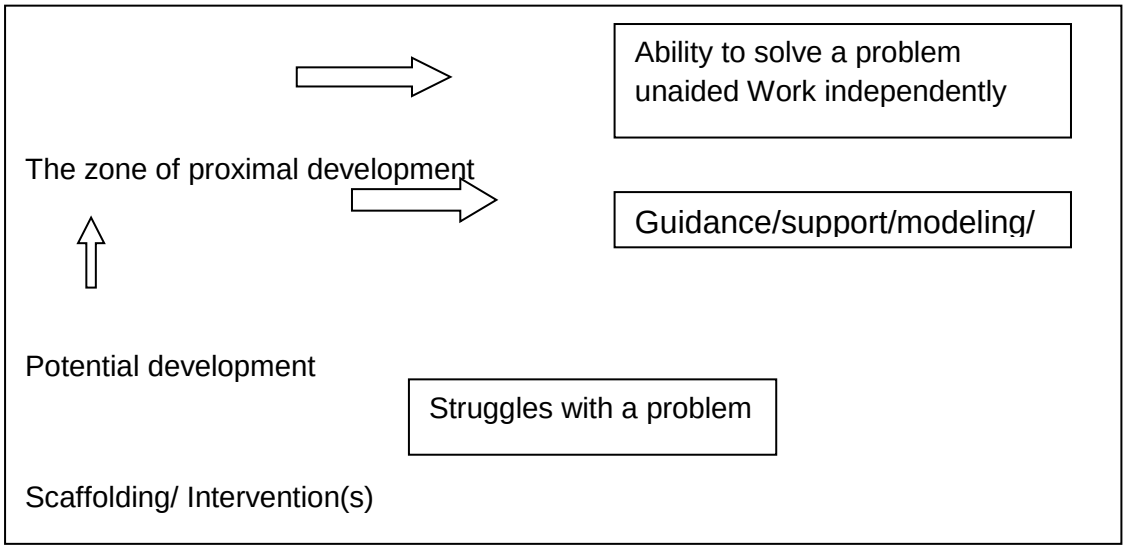

Diagram 2.1: An Illustration of the zone of proximal development

When Mascolo (2009:7) posits that *"A child cannot ordinarily create the zone of proximal development himself; he needs the more expert individual to bridge the gap between his current developmental level and his proximal level of development,"* the more expert individual is the teacher. Moreover, the teacher's teaching approach is informed by the understanding that knowledge cannot be transferred intact from the head of a teacher to the heads of students (Lorsbach & Tobin, 1997:3). Schreurs and A-Huneidi (2011:3) listed at least the following four roles of a teacher in a constructivist theory:

- To try to understand how students interpret knowledge;
- To guide and help them to refine their understanding and interpretations;

- To correct any misconception arising among students at an early stage; and
- To improve learned knowledge quality.

Schreurs and A-Huneidi (2011:4-5) suggest the following as the vital teaching activities in a constructivist theory:

- Content presentation by the teacher;
- Exercises;
- Organising activities where students will have to find new related knowledge, often when they can search for literature in the library;
- Link discoveries with existing knowledge;
- Organize a project so that learners will have to apply and expand knowledge in a new situation; and
- Evaluate what they learned.

When bridging the gap between a learner's current development level and his/her proximal level of development, the following option is feasible:

Introducing learners to different (science) topics; this may take a variety of activities, e.g., short lectures, textbook readings, and confirmatory laboratories. After the introduction, students would be asked what interested them about that topic and will be encouraged to pursue and test these ideas.

By confirmatory laboratories, learners will be afforded experiences involved with interaction of an individual with events, objects or phenomena in the universe, an interaction of the senses with things, a personal construction which fits some of the external reality. It is only through five senses, namely; seeing, hearing, touching, smelling, and tasting that an individual interacts with the environment. Also, it will be from such experiences that learners will make their personal discoveries. With these messages from the senses, an individual builds a picture of the world.

Schreurs and A-Huneidi (2011:4) maintain that collaborative and cooperative designs are essential for constructing new knowledge. Their reasons emphasise that:

- Cooperative and collaborative learning expose learners to alternative viewpoints;
- Knowledge construction takes place in individual contexts and through social negotiation, collaboration and experience; and
- The interchange of knowledge and discussion about viewpoints within a team of students.

Therefore, by dividing learners into groups to conduct library research, formulate questions/problems and a procedure to test the questions/problems, a cooperative learning strategy is being applied. This further allows individual learners to test the fit of their experiential world with others. This process involves discussion and attentive listening, making sense of the points of views of others, and comparing personal meanings to those embedded within the theories of peers. These interactions with others cause perturbations, and, by resolving the perturbations, individuals make adaptations to fit their new experiential world.

Lorsbach and Tobin (2003) are supportive of the fact that when a person understands how a peer is making sense of a point of view, it is then possible to discuss similarities and differences between the theories of peers within a group. Justifying one position over another and selecting those theories that are viable can lead to a consensus that is understood by those within a peer group.

Schreurs and A-Huneidi (2011:4) also propose that a constructivist instructional model revolves around the following five learning principles:

- ***Engage****: Learners should be engaged in the concept, process or skill(s) to be learned;*
- ***Explore:*** *Learners should actively explore their environment or manipulate materials;*

- ***Explain****: Learners should experience opportunities to verbalize their conceptual understanding or to demonstrate new skills or behaviours;*
- ***Elaborate****: To practice skills and behaviours result in deeper and broader understanding of major concepts; and*
- **Evaluate**: To assess learners' understanding abilities

2.3.2 The contrasting implications between teacher-centred learning and learner-centred learning

The following table illustrates contrasting activities between what happens in a traditional (teacher-centred) classroom and a constructivist classroom (learner-centred classroom). It should be noted that all learner-centred approaches are based on constructivist theory.

Table 2.1: The contrasting activities between what happens in a traditional behavioristic (teacher-centred) classroom and a constructivist classroom (learner-centred classroom) (Education Broadcasting Corporation, 2004).

Teacher-centred Approach	Learner-centred Approach
Curriculum begins with the parts of the whole. Emphasises basic skills.	Curriculum emphasises big concepts, beginning with the whole and expanding to include the parts.
Strict adherence to fixed curriculum is highly valued.	Pursuit of student questions and interests is valued.
Materials are primarily textbooks and workbooks.	Materials include primary sources of material and manipulative materials.
Learning is based on repetition.	Learning is interactive, building on what the student already knows.
Teachers disseminate information to students; students are recipients of knowledge.	Teachers have a dialogue with students, helping students construct their own knowledge.

Teacher's role is directive, rooted in authority.	Teacher's role is interactive, rooted in negotiation.
Assessment is through testing, correct answers.	Assessment includes student works, observations, and points of view, as well as tests. Process is as important as product.
Knowledge is seen as inert.	Knowledge is seen as dynamic, ever changing with our experiences.
Students work primarily alone.	Students work primarily in groups.

2.4 THE BENEFITS OF USING LEARNER-CENTRED TEACHING

In terms of Saskatchewan Learning (2005), effective learner-centred instruction/facilitation is an art as well as a science, and focuses on learning and the learner. Ideally, the learner is an active participant in the teaching and learning process and works with the facilitator to decide on content and process.

Blumberg (2008:2) emphasizes that strong research evidence exists to support the implementation of learner-centred approaches instead of instructor-centred approaches. Knowledge of this research helps instructors defend their teaching methods to their students and to more traditional faculty peers. De la Sablonnie, Taylor and Sadykova (2009:3) posit that *"According to researchers in the field of education, there is evidence to support the view that a student-centred approach has positive consequences to learning (Specifically, the student-centred approach, or what he refers to as the Child-Centred Pedagogy (CCP), and it promotes class participation".* This new approach allows students to become more open and more at ease making decisions on their own, and it also recognizes that interactions between teacher and student are natural, thus breaking the psychological barrier whereby students see their teachers as experts. The researcher regards the ability to make own decisions as a patent milestone of intellectual maturity. This helps to boost self-confidence in that learners realize that not only the teacher but they themselves are capable of thinking and therefore are not blank sheets.

Student-centred teaching enables students to create knowledge, as opposed to passively receiving information, and encourages deep learning. This approach focuses primarily on what the student needs to do in order to learn, rather than on the course content or the transmission of information by the teacher. Hence, the practical conclusion can best be explained in terms of an old adage which says 'Teach a child how to catch a fish rather than giving him a fish'. The implication is that learner-centred teaching promotes independent learning. This is further accentuated by Weimer (2012), when alluding to the fact that those approaches that use active learning strategies to engage students directly in learning processes enhance academic achievement and promote the development of important learning skills, such as critical thinking, problem solving, and the ability to work cooperatively with others. Such skills are perhaps the embodiment of intellectual growth which is one of the definitive aims of learning. Further clarity on the purpose of knowledge acquisition is underlined by Rizescu, and Rizescu (2009:135-141) when affirming that *"to know how to put the acquired knowledge to good use is a major desideratum of post-modern education".*

Since the quality of knowledge acquired informs the quality of decisions and skills to be executed, learner-centred learning provides the fundamental psychological principles of modern didactics and enables the transition from the 'intuitive learning' based on imitation and routine to the 'active learning'. This further stimulates learners' operational thinking, capacity to take an active part in the acquisition of skills, strategies, knowledge and attitudes (Rizescu & Rizescu 2009).The vital question to be asked is how best can such creativity, skilfulness and originality be promoted? An answer which can be found by comparing and contrasting the two teaching and learning styles, to which Culture Shift (2012:1) responds by stating that "*to meet the needs of the diverse student population, the education system must provide a more personalised, rigorous and collaborative learning environment that moves from the teacher-centred, one-size-fits all instructional strategies toward a learner-centred model".* This exposition further highlights the pertinent ingredients that advocate the significance of a learner-centred teaching. It recognizes and accommodates diversity of the student population; also, it promotes collaboration among learners which in turn helps to inculcate cooperative skills necessary for social cohesion, a dimension which continues beyond school life.

In a study conducted by Derting and Ebert-May (2010) who specifically wanted to know if the infusion of two new introductory courses early in a student's curriculum, both based on learner-centred inquiry-based principles, are associated with improved long-term understanding of biological concepts and biology as a process of inquiry. Their findings showed that exposure to two courses that use scientific teaching to enable students to inquire and think critically about science was associated with sustained improvement. Of greater significance is that their longitudinal data indicated that the benefits of learner-centred teaching may extend far beyond the class (es) in which such teaching occurs.

2.4.1 Learner-centred teaching as a referent to Science teaching

Lorsbach and Tobin (2003) provide a very useful example from Driver (1989) whereby the teaching practices of two teachers at City Middle School may best illustrate how practice can be influenced by making sense of teaching and learning from constructivist and objectivist-oriented perspectives. The cited practice is explained through an analogy of two teachers who are hereby referred to as Bob and John: It is also critical to note that common between the illustrated teaching practices cited is that both teachers were teaching grade six learners and that the subject is Biology (Life Sciences) for which Lorsbach and Tobin (2003:2) insist that *"from a constructivist perspective, science is not the search for truth. It is a process that assists us to make sense of our world*".

2.4.1.1 An illustration of an objectivist-oriented perspective practice and a student-centred activity-based constructivist perspective (Driver, 2003)

Bob made sense of teaching from an objectivist-oriented perspective. To Bob science was a body of knowledge to be learned. His job was to 'give out' what he (and the textbook) knew about science to his students. Thus, the learning environment Bob tried to maintain in his classroom facilitated this transfer of knowledge:

- The desks were neatly in rows facing Bob and the chalkboard;

- Lectures and assignments from the text were given to students; and
- Bob tried to keep students quiet and working all during the class period to ensure that all students could ‘absorb’ the science knowledge efficiently;

Bob's notion of teaching and learning was his belief that he had so much to cover that he had no time for laboratory activities.

Bob’s teaching style

Bob's sixth grade students were to complete a worksheet that covered the concept of friction.

- After the students completed the worksheets; Bob went over the answers so the students could have the correct answers for the test later in the week.

From a constructivist perspective

- Bob’s students did not get opportunities to relate the concept of friction to their own experiences.
- There were there opportunities in Bob's lesson plan to negotiate meanings and build a consensus of understanding.

On the other hand:

John made sense of teaching and learning from a constructivist perspective. John's classes were student-centred and activity-based. Typically, in his high school classes:

- John introduced students to different science topics with short lectures, textbook readings, and confirmatory laboratories.
- After the introduction, John would ask students what interested them about that topic and encouraged them to pursue and test these ideas. Students usually divided themselves into groups and then conducted library research,

formulated questions/problems, and procedures to test the questions/ problems. In other words, the students were acting as scientists in the classroom.

- Like Bob, John taught a sixth grade class previously and also taught students about friction. Included in John's lessons were activities to get students involved. Students rubbed their hands together with and without a lubricant so that they could see the purpose of motor oil in engines.
- The students conducted experiments with bricks to learn about different types of friction, and even watched the Flintstones in class to point out friction and what would really happen (i.e., Fred would burn his feet stopping his car,). John spent two weeks teaching his unit on friction.

From a constructivist perspective

- John's students were given opportunities to make sense of the concept of friction.
- They were able to use personal experiences.
- John's students were able to get deeper understanding of friction.

In support of a constructivist perspective, Grouws and Cebulla (2000) underscore that teachers should concentrate on providing opportunities for students to interact in problem-rich situations, to be more appropriate. Besides providing appropriate problem-rich situations, teachers must encourage students to find their own solutions. This helped to disclose the problematic (al) claims and assumptions about the relationship between curriculum and society.

2.5 THE CONTEXTUAL FACTORS THAT AFFECT POSITIVE LEARNING

Before positive learning can take place, there are a few conditions or factors that serve as the prefaces upon which positive learning can occur. The following are some of them:

2.5.1 The attitude or mind-set towards learning

In terms of the researcher's observations, learners' mind-set towards learning is determined by inter alia the level of motivation accrued from the value they attach to education, i.e. which advantages they think education will afford them? Do they have role models to emulate? Which job prospects do they associate education with? In a given context, very little effort can help to motivate learners in rural environments. A common practice is that most educated professionals leave rural environments once they become economically self-reliant. The current high rates of youth unemployment have not helped to motivate learners to value education. They have first-hand experiences of living with their graduate brothers, sisters and neighbours who are unemployed.

2.5.2 The observable OBE impact on the learners' performances

Most studies have rated South Africa among the lowest in terms of literacy and numeracy. The 2011 ANA results for grade three and grade six signposted the performance of South African learners. In terms of percentages, Mathematics grade three, the national average pass percentage was 35% and 28% in Literacy. And, in grade six, Mathematics was 30% while Literacy was 28%. The researcher maintains that the two subjects, Literacy and Numeracy, should also be considered as the basic tools for learning. Without the two, learning cannot begin.

Furthermore, Kriek and Grayson (2009:1) alluded that international measures also indicate that South African learners are performing poorly in Science. For example, of the 38 and 50 countries that participated in the Trends in Mathematics and Science Study (TIMSS) in 2001 and 2003, respectively, some of which are developing countries, South African learners came last in Mathematics and Science (Howie, 2001).

The researcher observed that learners from the selected schools reach post primary levels without having acquired minimum skills in literacy and numeracy. Hence, there is insufficient prior learning which underprepares them for advanced grades.

2.5.3 The culture of learning that is fostered

The new culture of learning that came with the educational innovations in South Africa had implication for both teachers and learners (Blumberg, 2008). Traditionally, instructors focused on what they did, and not on what the students are learning. This promotes passiveness on the part of the learners. Hence, this discourages them from taking responsibility of their learning. Educators call this traditional method "instructor-centred teaching". In contrast, "learner-centred teaching" occurs when instructors focus on student learning. This study intends to further establish whether learners are by now active and take responsibility for their learning and if teachers do focus on what students are learning.

Before the OBE system, only the content of the courses and what the teacher or the textbook had to say were important. Learners received information from the teacher and did not play a very active role in the learning situation. Most of their learning was memory-based. Learners were seldom given the opportunity to show what they learned and how to use their knowledge. It was important that learners remembered and repeated everything they learned, and not whether they understood and were able to use what they had learned in different ways or situations (Education Information Centre, 1996).

A more useful presentation of student-centred learning is to see these terms as either end of a continuum, using the three concepts regularly used to describe student-centred learning.

The following table shows a comparison between the teacher-centred and learner-centred continuum.

Table 2.2: Student-centred and teacher-centred continuum

Student-centred and teacher-centred continuum	
Teacher-centred learning	**Student-centred learning**

Low level of student choice	High level of student choice
Student passive	Student active
Power is primarily with teacher	Power primarily with the student

Al-Mekhlafi and Nagaratnam (2012) made reference to the context of Oman, one of the countries in the Gulf, where the Ministry of Education decided to adopt child-centred classroom methodologies (CCCM) in 1998 as part of its efforts to reform the school education system. More effort was put into integrating CCCM into teaching and learning in all subjects. In 2004, however, when teachers' knowledge and practice of CCCM was found to be very low even after about six years, the Ministry decided to implement it as a project in 36 basic education schools from five different regions. The results of two programme assessments made in 2006 revealed that the practice had still not improved much and that teachers had many misconceptions about CCCM and that the training needed to be more efficient (Al-Salami, 2010).

In March 2010, the results of a project study designed to measure the effectiveness of the learner-centred methodology in the pre-service education methods course in the only public university in Oman were reported (Al-Humaidi, Abu-Ramah & Schreck, 2010). Very little research has been undertaken and reported on the implementation of learner-centred pedagogy as discussed in this paper in the context of higher education in the Gulf region in general and Oman in particular. This cannot be a more archetype of South African experiences. Hence, Blignaut (2008:107) concludes that *"On the basis of this evidence, it is likely that South African teachers will experience the same problems as their international counterparts in the implementation of the new curriculum policy."*

Bransford, Brown and Cocking (2000) believed the current efforts to transform educational environments toward learner-centredness are to a great extent an attempt to motivate students to be intentional learners and to change their attitude about learning to develop a new mind-set.

Weimer (2002) described five learner-centred practice areas that need to change to achieve learner-centred teaching, namely; the Function of Content, the Role of the

Instructor, the Responsibility for Learning, the Processes and Purposes of Assessment, and the Balance of Power.

- The functions of the content in learner-centred teaching include building a strong knowledge foundation to develop learning skills and learner self-awareness;
- The roles of the instructor should focus on student learning. The roles are facilitative rather than didactic.
- The responsibility for learning shifts from the instructor to the students;

The instructor creates learning environments that motivate students to accept responsibility for learning;

- The processes and purposes of assessment shift from only assigning grades to include constructive feedback and to assist with improvement. Learner-centred teaching uses assessment as a part of the learning process.

The balance of power shifts so that the instructor shares some decisions about the course with the students such that the instructor and the students collaborate on course policies and procedures.

While Weimer's (2013) model enticed to faculty, they find that it is less pragmatic in describing ways to implement change (Wright, 2006). Since these five practices are broad abstract categories, they do not identify specific learner-centred behaviours for many instructors. To assist faculty, Wright (2006) defined each practice into specific components and incremental steps between instructor-centred and learner-centred teaching. Incremental steps allow instructors to make changes gradually over time. These incremental steps define a manageable transition process from instructor-centred to learner-centred teaching.

2.5.4 The physical environment

As Bogdan (2011:1) contends: *"Our students come into the classroom with the same attitudes and expectations as the society in which they live".* The researcher agrees that in most rural environments, circumstances are not favourable to learning especially in poor households. Factors like lack of lighting, domestic tasks performed by rural children, shortage of furniture to work on, do not encourage learners to learn. These home circumstances may also include insecure or unstable environments and financial insecurity often leading to anxiety and emotional stress, which may be increased by violence and abuse in some.

Zweck (2006) suggested 10 different types of classroom layouts that facilitate active learning approaches. These layouts include a U-shape, team style, conference table, circle, group on group, work station breakout grouping, traditional classroom, or auditorium arrangements. The selected schools where this study was conducted all are classified between quintiles 1 and 2 in terms of poverty levels. This benchmark used by the Department of Basic Education is informed by the level of poverty in relation to the community in which the school is located. As van der Berg (2010:11) insists: "*Absolute poverty – the absence of adequate resources – hampers learning in developing countries through poor nutrition, health, home circumstances (lack of books, lighting or places to do homework) and parental education".*

Apparent constraints in underdeveloped communities are further posed by the lack of educational facilities and resources, and the absence of learner transport to mitigate long distances they have to travel. These constraints further cause insecurity, instability, anxiousness and even emotional stress to learners. Adopting and adapting to a learner-centred teaching environment, which encourages students to become independent learners and ultimately to be in charge of their own education, can sometimes be a tall task. It is for these reasons that O'Sullivan (2003) described student-centred learning as a Western approach to learning which may not necessarily transfer to the developing countries, such as Namibia where there are limited different learning cultures. It can be equally hard at times to see how the approach can be economical in the large classes associated with many current university undergraduate courses.

2.6 THE ROLE OF RESOURCES IN IMPLEMENTING A LEARNER-CENTRED TEACHING APPROACH

Simelane (2010) alluded to the fact that the implementation of OBE heavily relies on the availability of resources. Consequently, the South African Department of Basic Education should make provision for such needs in schools in order to motivate learners to attend school regularly. This will also improve the learners' performance. For any relevant and effective implementation of OBE, a school library, computers and a laboratory have a critical role in promoting learners' active participation which in turn will maximize their achievements. The inadequacy of resources, therefore, hampers not only effective teaching and learning, but also derails a critical mode of implementing self- discovery learning, which is an integral part of learner-centred approach.

When Curriculum 2005, and OBE, was introduced in South Africa, Blignaut (2005) noted that a careful study of policy documents highlighted the importance attached to concepts such as active learning, understanding, group work, learner-centredness that are contrasted with concepts such as 'passive learners', 'rote learning' and 'teacher-centredness' (DoE, 1997a; DoE, 1997b). Dhurumraj (2013) confirms the critical role of resource materials by mentioning that *"Outcomes Based Education (OBE) placed tremendous emphasis on making learning a two-way process".*

Part of the learner-centred learning concept is self-discovery. Smartt (2008) defines self-discovery learning as the ability of an individual to learn through personal experience and natural exploration, often motivated by curiosity. Self-discovery can also be prompted by an external teacher such as a parent or school teacher. Through the active use of our senses, and the ability to make mental connections, learning takes place. If the child is encouraged to experiment, and exercises his mental processes by asking questions and connecting facts, his or her learning will go far beyond what just a teacher can teach him. The child is actually teaching himself or herself. Unlike learning from lectures and reading, experiential learning is retained at a very high rate.

Hoadly and Jansen (2010) believe that there is little chance of OBE becoming successful in poorly resourced schools. It was therefore imperative to establish the readiness of the selected schools in terms of the availability of resource material through which self-discovery learning could be possible. This assertion calls to mind the gaps that existed and still exist between former advantaged and disadvantaged rural schools in South Africa. It also questions the rationality of implementing similar educational changes and innovation in an unequal country like South Africa.

Where students have to be in charge of their learning as in student-centred learning, instructional materials enable them to use more than one sense to facilitate active learning. For active teaching to succeed, it is therefore necessary to evaluate the availability and the roles of at least the basic educational resources in facilitating learner-centred teaching.

2.6.1 The role of a school library

Douglas and Wilkinson (2010:15) contend that "A 21st century vision for any school activity must start with delivering effective learning outcomes. For a school library and a school librarian service, the core outcomes are: supporting literacy; motivating children to love and enjoy reading; teaching children to access and use information and turn it into knowledge". This assertion expresses the ultimate ideals which informed the reasons for the democratic South African government to change the education system which was considered oppressive to the majority of the people, particularly blacks. This kind of the education system to a large extent discouraged problem –solving methods and approaches such as learner-centred teaching. Hence, the Equal Education (2010) has noted that the Department of Basic Education, in its attempt to reverse the adverse effects of Bantu Education, sets out to introduce a number of changes to the system, which included the introduction of OBE (under Curriculum 2005).

This new curriculum placed a greater burden on teachers and learners – particularly because of its emphasis on research-based learning and learner-centred teaching strategies, which in turn demanded greater access to resources. Any research-based learning means that in order to explore, discover information and investigate,

adequate resources are needed. However, it is common knowledge that the current education system in South Africa suffers many of its setbacks as a result of the legacy of apartheid. Many of the backlogs in school infrastructure have arisen as a direct result of the policy of Bantu Education designed to suppress the educational development of the majority of learners in the country. Equal Education (2010) refers to the absence of resources as particularly acute in the case of functional school libraries which are enjoyed by only 8% of public schools. Nevertheless, the government has to date failed to adopt a national policy on school libraries, nor finalized proposed regulations aimed at addressing the backlogs and inequality in access to well-resourced school infrastructure, the absence of which severely hampers any implementation of learner-centred approaches.

(Lynn, 2010) confirmed the fundamental role of a school library as a vehicle which ensures the development of strong literacy skills in learners To do this, learners, particularly in primary school, need access to a multitude of books which they can read for pleasure. It must be borne in mind that the majority of young people do not grow up in homes with books, or in neighbours with bookshops or public libraries.

Abell and Roth (1999) suggest that the research tradition that exists in unparalleled as it centres on students' achievements in reading, study skills, and several aspects of the school library programme. In that review, student achievement has accordingly been broken down into:

- Academic achievement (as represented in standardized tests);
- Reading literacy (including reading for pleasure);
- Broader learning (such as information skills, improved self-concept); and
- Other (such as impact on particular sub-groups).

Attard, Di Iorio, Geven and Santa (2010) revealed that most of the literature they examined moves away from the traditional concept of a library, where writings are accessed in hard copy at the place in which it is kept. This accentuates the need for libraries to keep pace with change that propels them into a central role within the teaching and learning environment.

- **Providing information resources**

This underlines the fact that over and above the traditional role of a library which involves selection, organising, storage and retrieval of information, such information should be retrievable in off campus sites.

- **Fostering partnership and collaboration**

This is in order for them to help teaching staff in using technology in innovative ways across the curriculum, to select appropriate technology resources and to collaborate with the learning community to plan, design, implement and continually refine an effective student-centred technology plan.

- **Develop outreach programmes**

This is to ensure that information can be accessed even outside the walls of a library building. This should address the need for information to become accessible in multiple places and an environment for learner-centredness and self-discovery by students.

Developing students' information literacy skills together with members of teaching staff

This is in order to ensure that students know when they need information, identify information relevant to addressing their problem, find, evaluate, organised and use the information effectively in addressing the problem facing them. As contained in the current South African curriculum, Frantsi, Kolu and Salminen (2002:19) refer to the roles of a school library as "*promoting interest in the surrounding world, curious information retrieval, independent work, creative problem solving, awakening one's own reading for pleasure and lifelong learning skills".* The researcher also views the role of a school library as to provide opportunities for students to learn at a personal level of enquiry, outside the assigned curriculum. In this way, learners are able to work independently, thereby inculcating the spirit of

learner-centred approach. However, in the South African context, the provision of libraries in schools is still derisory. Dzvimbo (2012) reiterates that even nowadays the entire continent of Africa still struggles with the long-standing dare of educational resources. The absence of libraries has deeply affected school life, and in some cases has made it almost impossible to pursue educational goals, let alone the adoption and implementation of learner-centred teaching.

The persistent shortages in schools' infrastructure in South Africa and the admission by the Department of Basic Education that progress is inadequate and uneven led to the development of the National Policy for an Equitable Provision on an Enabling School Physical Teaching and Learning Environment (and the National Minimum Norms and Standards for School Infrastructure).

The Equal Education Report (2009:9) states that since 1997 six consecutive drafts for a national policy on school libraries have fallen short of adoption and implementation. Without the national policy to deal with this backlog, it is no wonder that there has not been much progress in the last 15 years.

2.6.2 Computer technology and learner-centred teaching

Research on the influence of classroom computer use on student achievement has reported mixed findings (Sun and Bradley 2003). It is, however, crucial to understand the actual variable(s) behind the findings of every study. Some of the factors that influence the findings, for example, the frequency of access and use of a computer and learners' background, should be considered so as to verify the validity of the findings. This section begins by explaining the pitfalls of establishing the actual benefits of computer-aided instructions by some researchers. Thereafter, it will discuss the advantages which are the imperatives for incorporating computers in school curriculum.

2.6.2.1 Studies which did not find links between computer technology and Learner-centred performance

Haung (2008:76) posits that *"using computers for students to learn on their own do not show a significant relationship to students' reading performance in exa*ms". Teachers need to explain the subject and guide the students through the computer activities, not just let them use the computer on their own without proper guidance. This is supported by Smith (2012:1) when he says *"from research, it can be concluded that computer assisted instruction (CAI) is best used when it is in addition to the instruction of a teacher and not when it replaces the teacher".* Huang (2008) has cited the following studies which arguably missed to identify the actual role of computers in learners' academic achievements:

Dynarski, Agodini, Heaviside, Novak, Carey, Campuzano and Means (2007) conducted a study on the effectiveness of reading and maths software products on elementary first and fourth grades students. They found that the students' test scores were not significantly higher in classrooms using selected reading and maths software products and teachers were not very well trained about the software they were using. In this study, the cause is the level of educators' literacy on the use of computers. Therefore, it can be argued that the success of CAI relies on the level and the relevance of educators' computer skills. These will include, *inter alia*, the teachers' computer training, software application training, training on the use of the internet and integrating technology in the curriculum.

A federal study in the USA found no edge for students using technology-based reading and maths products (Trotter, 2007). The $10 million study (Trotter, 2007) of 15 educational software products is the most extensive federal study, but the study showed students who used technology had no significant difference in maths and reading achievement compared to other kinds of teaching practices. The study raised many questions about the impact of computer technology on students' learning on both sides of the argument. The Software and Information Industry Association (SIIA) as well as the principals' association of the software and digital content industry debated that this study does not diminish the critical role that technology plays as an essential skill set for the 21st century (eSchool News, 2007). SIIA indicated that most teachers from the study said they would like to continue to use the products. They also learned from the study that implementation of educational software is crucial to the success of any technology. There is a need for an appropriate match of

technology design to the local curriculum. The study by Dynarski et al. (2007) highlighted the importance of developing and using computer software which will address the curricular needs of the school.

Yildirim (2006) conducted a study on second-year pre-service teacher education students in Turkey to find the impact of hypermedia authoring on knowledge acquisition and retention. Forty-eight (48) second-year pre-service computer teachers who enrolled in a course called Instructional Technology and Material Preparation participated in this study. Their results showed that the use of hypermedia as a cognitive tool resulted in a similar level of student achievement as those who were enrolled in traditional instruction. They concluded that Turkish students had been exposed to traditional teaching for a long time. They were not used to the technology way of teaching. Such a conclusion does not capture the purpose of learning as a vehicle of change. Also, it is in direct contrast with what is perceived to be a 21st century learner. Rodgers, Runyon, Starret and Von Holzen (2006:1) point out that, *"There is mounting evidence that today's traditional students those born after 1982 - have a different relationship with information and learning than do previous generations, as a result of their access to the internet and computer technology".* Nobody can reject the reality that computers are at the centre of today's youth. Adults and educators are at times surprised at the level of technological literacy by their children and the fast rate at which they learn to operate computer gadgets. Rodgers, Runyon, Starret, & Volzen (2006:1), say: *"Terminology such as 'Chat',' Blog', 'Blogging', 'IM', 'ON_LINE' to 'Google' and 'Text messaging' are used unconsciously by the 21st century learners".*

2.6.2.2 Studies supportive of integrating computer technology in learner-centred teaching

Other studies about the effectiveness of computer use for instruction had found a positive relationship between computers' use and students' academic achievements (Fuchs & Woessmann, 2004; Salerno, 1995). These supported the argument that instructional activities that involve the use of technology capture the interest of students, which facilitate their understanding of the content and provide different ways of expressing knowledge and therefore have a positive influence on

performance. Mokhele (2012:4) said that technology is the best thing to have happened to teaching; it has revolutionized the profession and brought energy and innovation and also emphasises the implementation of learner-centred teaching. McGowan (2007:52) refers to the role of technology in the classroom as actually an issue of literacy. The term 'literacy' refers to concepts beyond reading and writing. Literate students must be knowledgeable of and skilful with globalization, automated social interaction, the World Wide Web, and new cultural dynamics (Stokes, 2000). Furthermore, Stokes (2000) provides examples of the way in which technology will transform education: from augmenting traditional textbooks to providing Web-based tutorials outside of the classroom. Commenting on South African schools, Carrol (2003:15) concludes that "*two thirds of our schools lack infrastructure to connect with the internet".* Nesane (2008:44) alludes that in many South African schools, instructional media are neither used nor available although teachers regard such media as necessary and useful.

2.6.2.3 The benefits of integrating computer technology in learner-centred teaching

Schwartzbeck (2012) argues that a learner-centred approach will not succeed without a cultural shift throughout the education system that includes maximizing the potential of digital learning to meet students' needs. This argument underscores the role of computer technology not only in modernizing and improving the quality of teaching and learning but specifically in demonstrating a shift from a traditional approach to a learner-centred approach. This is due to the fact that computers are capable of providing numerous teaching and learning activities that are consistent with learner-centred approaches.

Emanuel (2007:1) posits that "*technology, in acquiring knowledge and skills, is an extremely essential component of education and training at all levels: primary, secondary higher and professional education".*

Computer use by teachers and students is getting more and more common every year. Students and teachers use computers for different tasks and reasons; they are tools in today's academic environment. Siskos, Antoniou, Papaioannou, and Laparidis, (2005) report that students are expected to learn more through computer use: test scores can rise, and students would learn at a faster rate. Moreover, computer-assisted education could assist students in their preparation to enter and compete in a modern, global workforce (Oppenheimer, 1997). In addition, Soong (2005:596) posits that *"a computer mediated medium is sufficiently rich to allow for meaningful knowledge co- construction and negotiation between students"*. However, well-designed Computer Mediated Communication (CMC) environments should not impede learning. Secondly, the getting students to work collaboratively on solving problems in an asynchronous CMC environment could provide a rich field for gleaning students' conceptions in a naturally occurring context. Hai-Jew (2008:1) argues that sophistication of automation in pedagogy, rich authoring tools for multimedia and faster internet connectivity, and various opt-in learning spaces offer more effective learning opportunities for users.

Rose and Meyer (2007) argue that new digital media (versus traditional media of textbooks and lectures) facilitates a more universally designed environment because the new media is inherently flexible. They outline four characteristics of digital media that are particularly beneficial for classroom application: digital media are versatile, are transformable, can be marked, and can be networked. Indeed, these are potentially valuable characteristics of learning environments or materials mediated by technology.

Transitioning teachers from a passive role of primarily disseminating knowledge to being actively involved in the students' discovery and application of information creates a powerful learning experience for students (Alliance for Excellent Education, 2012). In terms of Culture Shift (2012), to meet the needs of the diverse student population, the education system must provide a more personalized, rigorous, and collaborative learning environment that moves from teacher-directed, one-size-fits-all instructional strategies toward a learner-centred model. Furthermore, learner-centred education dramatically impacts the work of educators, and education systems and schools must empower teachers to apply their pedagogical knowledge, instructional skills, and digital tools and resources to meet the needs of individual students.

2.6.3 The school laboratory and Science teaching

Hofstein and Lunetta (2003:35) refer to the science laboratory as a unique learning environment, and a setting in which students can work cooperatively in small groups to investigate scientific phenomena. Also, they suggested that laboratory activities have the potential to enhance constructive social relationships as well as positive attitudes and cognitive growth.

The reason for prioritizing science subjects is that developments in medicine and technology would not be possible without the brilliant and dedicated scientists and researchers. Many of them developed their lifelong interest in the field while they performed their first experiments in the labs of their respective schools. Yet these subjects generally are the most challenging; most schools consider them as 'killer' subjects as most learners struggle to pass them. Kriek and Grayson (2009:1) stated that international measures also indicate that South African learners are performing

poorly in Science. For example, of the 38 and 50 countries that participated in the Trends in Mathematics and Science Study (TIMSS) in 2001 and 2003 respectively, some of which are developing countries, South African learners came last in Mathematics and Science (Howie, 2001; 2003:1-20). Furthermore, Reddy (2004), who co-ordinated the study in South Africa, explained that there are multiple, complex problems that contribute to learner poor performance. These include poverty, resources, learning culture, infrastructure of schools and low teacher qualifications. This makes it necessary to provide relevant resources that can enhance, simplify and improve teaching and learning of these subjects. Since the study investigates the role of resources, it singles out one critical resource, obviously a school science laboratory, noting that the school where the study was conducted has neither a school laboratory nor a science kit. Kipnis and Hofstein (2008) maintain that science laboratory can offer learners opportunities to have more control over their activities, and enhance their perception of ownership and motivation. These benefits are also consistent with OBE which encourages learners to be in charge of their learning, and to decide how they want to learn.

Kipnis and Hofstein (2008) believe that laboratory activities have long had a distinctive and central role in the science curriculum, and science educators have suggested that many benefits accrue from engaging learners in science laboratory activities. The school laboratories are also a basic tool for implementing self-discovery learning in line with the constructivist learning theory. Teaching and learning becomes learner-centred whereby a required fit with the National Curriculum Statement (NSC) is realized. Besides the hands-on experience in lab research and experimentation, students also learn how to make a scientific argument. Writing, reviewing information, using the right language, constructing a logical line of reasoning, and responding to analytical comments are a few of the skills necessary to do this. These are valuable skills to have because of their usefulness in encouraging learner-centred teaching in any discipline (Kipnis & Hofstein 2008).

Kipnis and Hofstein (2008) describe the laboratory as the only place in the school where certain kinds of skills and understanding can be developed. This is further corroborated by Kriek and Grayson (2009) who posit that when the teachers use the

kit to perform experiments, both their conceptual understanding and experimental skills are developed. In addition, when the science kit is used in their classrooms to demonstrate phenomena and explain concepts to their learners, both their teaching skills and the learners' understanding are improved.

The lack of science laboratories in most disadvantaged schools has not only compromised the implementation of these new curricula - C2005, NCS and currently CAPS but also frustrated educators such that the balance of their teaching still remains traditional (teacher-centred). Science teaching is through lecture mode, thus learners have to memorise scientific terms and processes instead of conducting experiments.

Niewenhuis (2008) insist that schools that pride themselves on their innovative approach to teaching know that classroom instruction combined with laboratory experience achieves the best results. Evidence shows that this method increases mastery of the subject, aids in developing scientific reasoning, and cultivates interest in the subject.

Colen (2013) identifies three studies which demonstrate types of laboratory exercises which promote deep learning but also warrant active participation by learners.

The first one is the expository laboratory. This usually follows a traditional verification approach, meaning that learners follow a pre-set procedure and the teacher has a known outcome that is prescribed and what the teacher should use for assessment. However, this hardly complies with the learner-centred approach. Thus, this is heavily criticized by Domin (1999), who proposes the guided-inquiry approach as the best option for laboratory learning. This theory is also supported by Teixeira-Dias, de Jesus, de Souza and Watts (2005), who argue that guided approaches allow more learners control of the learning activities which in turn promote deep learning.

Another study by Berg, Christina, Bergendahl and Lundberg (2003) directly compared a single experiment presented in expository and inquiry formats. The finding suggests that the inquiry version led to more positive outcomes, both in terms

of learners' learning and learners' perception of the exercise. Such positive outcomes contribute heavily to a positive learning environment because learners feel ownership of their studies and positive achievement leads to a positive learning environment.

Another important consideration in enhancing positive learning environment is to ensure that the design of laboratory activities does not put excessive demand on assessment, therefore allowing learners to focus on the implication of what they are doing (Vianna, Sleet and Johnstone, 1999). According to Mayer (2004), it is well established that in any learning activity cognitive engagement is critical if meaningful learning is to occur and that physical activity alone is not a sufficient condition for learning to take place. It is, therefore, imperative that cognitive activities be directed towards educational usefulness to foster a positive learning environment. In a study on learning environments with engineering students, Lin and Tsai (2009:193) concluded that "*learning environments that are learner-centred, peer interactive and teacher- facilitated help engineering students develop more fruitful conceptions of the learning environment than other methods".*

2.7 THE CHALLENGES WHICH CONFRONTED EDUCATIONAL INNOVATIONS IN SOUTH AFRICA

While educational transformation was and is still necessary, given the value attached to learner-centred education, it cannot be assumed that such sweeping changes have materialized. Al-Mekhlafi and Nagaratnam (2012:1) warn that *"The belief that only those who quickly adopt the new proposals as and when they are introduced by experts qualify to be 'good teachers' is rather untenable".* Curriculum developers and policy makers may easily be carried away by new ideas because of the need to be fashionable and those who feel like questioning some of the assumptions underlying the proposals do not dare to do it for fear of being branded 'old-fashioned' and 'resistant to change'. The purpose of this study, then, is to investigate whether educational innovations in South Africa have reached the rural and former disadvantaged schools after more than two decades since they were instigated. Hence, the emphasis of this study is to evaluate learner-centred teaching as part of curriculum delivery in the under-resourced Dannhauser Circuit schools.

The reason for focusing on under-resourced schools is informed, among other factors, by the environmental challenges faced by rural teachers.

2.7.1 The demographic differences among South African provinces

In terms of the Constitution of South Africa, the country is divided into nine provinces, each with its own Legislature, Premier and Provincial Members of Executive Councils. Each province features its own distinctive landscape, vegetation, climate and socio-economic issues. Some of these provinces are in the grip of abject poverty where providing food and shelter is a daunting concern framing educational needs and impacting negatively on and undermining education. KwaZulu-Natal Province, from where the selected schools are located, is one of the most rural and highly populated provinces with the highest unemployment rate.

Report of the Ministerial Committee on Rural Education. (2005:1) stipulates that *"the challenges facing rural schooling are complex, intractable and inter dependable."* Chief among such challenges is the lack of resources which appears to be an enduring and obvious difficulty with which historically disadvantaged schools have to contend. In addition, inherited disadvantage is compounded by large classes that inhibit a learner-centred approach. As a result of these high numbers, teachers end up employing traditional teaching methods which hinge on teacher-centredness.

Malada (2010) insists that many previous systems had been excellent even though they might have had flaws and needed room for improvement, but instead of assessing what was good and building on that, the new approach was to discard tried and tested basic principles of education. The result was OBE, an approach that had already failed dismally in some first world countries. Attempting to make it work in South Africa, which is partially a third world country, was tantamount to re-inventing the wheel (Lawack, 2009).

2.7.2 Lack of academic thinking and content in South African Outcomes Based-education

The fact that even the designing of the new South African curriculum lacked academic thinking posed not only implementation challenges, but learning content as well. Vinjevold (2001), co-author of an important early study of the impact of C2005, warns that the lack of specific content was a terrible mistake because it undermines the overall goal of promoting equity within the school system. She further says that "*when you hide the rules of the game from the disadvantaged, you further disadvantage them".* For this reason, Blaine (2010) and Malada (2010) note that there was widespread ignorance as the new curriculum moved away from the crucial basics like reading, writing and arithmetic to a learner-centred approach. As a result, most learners at university level have been found to struggle with reading and understanding of content at a level that would reasonably be expected of a university scholar. Rooi (2012) confirms that it is an inescapable truth that education is a highly specialised field which can never be successfully served by political appointees (many of those who were rewarded for their role in the struggle-the so-called 'cadres' through being given senior appointments). They were not fit to fill highly specialised posts in the field of education (Lawack, 2009). Naicker (2006) pointed out that in general, government was sceptical of bringing on board university academics since many of them emerged from very conservative traditions as a result of the apartheid era. Thus, following the outset of democratic rule in South Africa in April 1994, it became clear that the transition was a political one and one particularly ill- suited to the field of education.

Political interference is further pointed out by Maphalala (2006:23) when he argues that OBE will not fail because *"politicians and bureaucrats are misinformed about conditions of South African schooling, but because the policy is driven in the first instance by political imperatives which have little to do with the realities of classroom life".* Hence, Harley and Wedekind (2004) agree that nowhere is the relationship between national political vision and national curricular more starkly illustrated than in South Africa.

2.7.3 The prioritization of the need to break away from the traditional learning culture

Political involvement in curriculum content and approach might have been overdone in South Africa. However, this should be understood against South Africa's need to break away from her political past. As more African countries embrace democracy in one form or another, it was logical that learner-centred pedagogy would serve as a complement to this political change by modeling some of the same practices in the classroom. The relationship between learners and teachers, especially opportunities for learners to express their views in the classroom, is considered influential in developing learners' views on democracy and their degree of civic engagement. Hence, Harber (2002:10) referred to a number of studies showing that African nations are moving towards learner-centred teaching across all subject areas as a means to cultivate the "*knowledge, skills and values necessary to promote and protect a democratic political culture*". To most South Africans then, it was critical that their new found democracy had to be protected and developed. To protect and sustain democratic values, education should instill willingness to participate, debate, responsibility and critical enquiry. However, the South African reality is that the political effects superseded academic imperatives such that, since the inception of the new educational changes, the curriculum has become volatile. These assertions are supported by the number of curriculum reviews since C2005 was introduced. The first review of C2005 was in 2000. The review resulted in Curriculum 2005 being renamed the NCS. The NCS was also reviewed in 2009 and it is now called the Curriculum and Assessment Policy Statement (CAPS).

2.7.4 Epistemological challenges

Further challenges relate to the epistemological structure of teachers. Naicker (2006:1) posits that "*Epistemology is the branch of philosophy that studies knowledge".* Heyligen (1993) further states that the first theories of knowledge stressed its absolute, permanent character, whereas the later theories put the emphasis on its relativity or situation dependence, its continuous development or evolution, and its active interference with the world and its subjects and objects. According to Spillane (2006), teachers' prior beliefs and practices can pose

challenges not only because teachers are unwilling to adapt to new policies, but also because their existing subjective knowledge may interfere with their ability to interpret and implement a reform in ways consistent with policymakers' intent.

Most teachers consider themselves to be not well trained to work with OBE; instead they were taught and trained in the traditional teacher-centred approaches. The researcher admits that traditional teaching practices are difficult to shed. Therefore, educators need to be trained and require information relating to their present skill levels, experience and teaching styles necessary to facilitate the implementation of a new curriculum. Manoucheri and Goodman (1998) conducted an ethnographic research in a study involving middle school teachers. They found evidence that teachers experienced problems with lack of sufficient time for planning, lack of conceptual understanding of mathematical concepts and lack of professional support.

It is an indisputable fact that most of the serving teachers in South Africa are the products of apartheid education. The question is: Are they able to discard how they were taught as learners and how they used to teach before the introduction of OBE? Hence, in all likelihood, they become inclined to stick to their habitual ideas of revolving their teaching around themselves; the approach which discards learner-centredness. Waugh and Punch (1985, 1987 as cited by Ha et al. 2010:53) proposed a model for teacher receptivity to change which has been widely validated and adopted. Their study provided empirical support for a range of variables affecting teacher receptivity towards system-wide change, including those concerning:

- beliefs about general issues of education.
- overall feelings toward the previous educational system.
- Attitude towards the previous educational system.
- alleviation of fears and uncertainty associated with the change.
- practicality of the new educational system in the classroom.
- perceived expectations and beliefs about important aspects of the new educational system.
- perceived support for teacher roles in school with respect to the main referents of the new educational system.

- personal cost-appraisal of the change.
- Beliefs about some important aspects of the new educational system in comparison to the previous system, for example teacher-centredness as opposed to learner-centredness.

2.7.5 The impact of cultural and local differences

Rahal (2010:35) states that “It is also claimed that attempts to adopt learning and learner-centred education are likely to be hindered by culture, language, politics, economy, teaching practices and student characteristics”. Hence, the researcher believes that teachers in general but particularly those in rural and poorly resourced schools cannot be blamed for their failure and misunderstanding of new ideas. The challenges they face could further be explained in terms of the environment, facilities and the limited support they receive. Nykiel-Herbert (2004) argued that some students’ learning is impaired by learner-centred pedagogy (LCP), especially those living in impoverished and isolated areas that have little access, if any, to experiences outside of their local communities. Furthermore, Nykiel-Herbert (2004:249-265) asserts that “such students will not learn much from one another using methods consistent with social constructivism, such as group work, because they have very similar life experiences and cultural understandings”. The researcher believes that it is for such challenges that rural/under-resourced schools in particular are denied capacity to transform their instructional programmes in line with the expected innovation of the new curriculum. Hence, Mouton, Louw and Strydom (2012:1212) insist that “the bottom line was that diverse cultures, extreme backgrounds of learners, values in education, and so forth, had to be taken into account”. However, the impact of such challenges is not limited to rural environments only. The standard of education in South Africa has been compromised. Hence, Maphalala (2006:37) posits that “Some critics of OBE believe that schools using an approach based on Outcomes Based Education will need to lower their standards to the least common denominator since not all learners have the same potential to learn at the same high standards.” As a practicing educator, the researcher confirms that South Africa has already succumbed to this criticism by

lowering pass marks to 30% in all Further Education and Training band subjects. The only exception is the mother tongue subject.

2.7.6 The corollaries of apartheid policy of skewed supply

Rogan and Grayson (2003:1175) opine that the process of change is context-specific, hence implementation must take into account the context of a particular school with regard to its teachers, learners, leadership and environment. The same view is echoed by Berman (1980) and O'Toole (1986) who proclaim that a context-free theory of implementation is not likely to produce powerful explanations or accurate predictions. Based on Berman's (1980) and O'Toole's (1986) arguments, the conclusion that can be drawn here is that implementation of a policy change depends on the context of a country or a specific school. In the South African context, the apartheid policy of skewed supply on racial lines has resulted in at least two types of schools, namely; the privileged white and well-resourced schools and the black under-resourced rural schools. Thus far the gap still persists.

In terms of poverty level, South Africa's schools are ranked into five quintiles. The lower quintiles represent high poverty levels, low levels of education, and high unemployment rates while the high quintile represents areas with less poverty, high levels of education, and low unemployment rates. Hall and Giese (2009) admit that the introduction of the no-fee schools policy has resulted in increased revenue for most no-fee schools, while simultaneously relieving the burden of school fees on poor parents, they still maintain that increased funding does not imply sufficient funding, or necessarily result in quality improvements.

Bransford, Brown, and Cocking (2000) identify four features characteristic of learner-centred learning environments. They must be:

- student centred.
- knowledge centred.
- assessment centred.
- community centred.

In thinking about the curriculum, educators tend to focus on knowledge and skills that students must acquire but rarely discuss the role of learners' attitudes and beliefs or the environment. The researcher's deliberate choosing of the study's setting, that is, schools in a rural environment, was informed by the inequalities that still prevail in South African schools. Bransford et al. (2000) refer to environment as the surrounding influences, the set of conditions that have an impact on learning.

Spaull's presentation (2012) reveals that South Africa still faces the reality of two different education systems, a dysfunctional schooling system (75%) and a functional schooling system (25%), which are miles apart in their respective performance. Despite the high spending and many interventions which were made by the government over the past 20 years, the system remains virtually unchanged.

The South African government spends 20% of total government expenditure on education, of which 78% goes to teachers' salaries. Yet, the education system continues to spread rather than ease inequality. If you are born into a family which is poor, your prospects for social mobility are very slim. Education is the main driver of social mobility but the system continues to reproduce inequality because there are so few good schools, which are also geographically and financially inaccessible to the poor". The researcher considers this situation as one of the basic factors upon which this study was conducted. Spaull (2012) concisely draws the following conclusions:

> *The gap between privileged former Model C schools and the under-privileged schools is still wide open. The 25% functional schools are those schools that benefited from the apartheid regime, while the remaining 75% are those from the poor, rural communities. Higher spending by the government does not address the inequalities in terms of schools' functionality and teaching approaches.*

The environment in terms of geographical location of the schools still has an impact regarding its detection or neglect. Hence, the researcher identified the following as

some of the hurdles that informs the level of readiness for effective learning among learners.

2.8 APARTHEID EDUCATION'S FOOTPRINTS AS RESTRICTIVE FACTORS TOWARDS THE IMPLEMENTATION OF LEARNER-CENTRED TEACHING

Schweisfurth (2011), one of the leading authorities on student-centred approaches in the developing world, summarised a review of 72 projects attempting to promote these approaches internationally as a history of failures great and small. Four main reasons for the failure alluded to are:

- *Governments often have overly high expectations of such reforms and try to make the change too quickly;*
- *Reforms in teaching aren't joined up with changes in the exam system and curriculum;*
- *Practical problems such as classes of 50 and a lack of appropriate materials; and, most importantly,*
- *Cultural mismatch. Approaches to teaching based on a Western idea of the individual don't fit well in cultures which emphasise group goals over individual needs. In such cultures, teachers are expected to be authoritative and learners obedient.*

In the South African context as well, moving away from apartheid education was more than just a political statement to affirm the onset of a new dispensation. Actual changes proved to be more baffling than anticipated.

2.8.1 The fundamental ideals of education reforms in South Africa

The Republic of South Africa (RSA, 1995:22) stipulates the following:

> *The recent reforms of the South African educational system were characterised by the ideals that the country needs to produce*

> *independent, critical thinkers who are able to question, weigh evidence, make informed judgments and accept the incomplete nature of knowledge*.

Hence, Lombard and Grosser (2008) conclude that this resulted in notions such as lifelong learning, learner-centredness and process-orientation learning, which have now became part of the colloquial language in South Africa. To achieve such perceived ideals, it became imperative that teaching methods and strategies should be refined such that they are geared to nurture critical thinking abilities. Since teachers are at the centre of the educational change process, a framework for continuing professional development (CPD) should be designed to help teachers refine their knowledge and skills, especially since producing changes in classroom practice, from a perspective of lifelong learning, seems to be a major challenge for the profession. The researcher concurs with Sonn, (2000:257) when he contends that

> *much of today's classroom learning is focused on activities by which the learner acquires facts, rules and action sequences and the majority of lessons require outcomes only at the lower level of cognition: knowledge, comprehension and application.*

This study argues that without empowering educators, no meaningful change can happen.

2.8.2 Poor pre-condition for launching learner-centred education in South Africa

When curriculum change was introduced in South Africa, Jansen, (1988:9) argued that

> *from a technical perspective, it could simply be argued that the prerequisites for fundamentally changing the apartheid curriculum are not in place.*

Research indicates that uses of technology can improve student outcomes (Haycock, 1995). Lack of resources is identified as a significant barrier toward the implementation of the learner-centred education approach.

In South African rural schools, teaching is still teacher-centred. This unfortunately denies learners the satisfaction of constructing knowledge and information on their own. Hence, they are denied quality education. Therefore, educators have a challenge of implementing the self-discovery learning approach due to the lack of libraries, laboratories and other resources through which active participation by learners can be ensured.

The results of the survey conducted by (Jabbour, 2013) indicated that the majority of the teachers (91%) reported that their schools lack the resources needed in order to integrate the learner-centred education approach in their classroom. Among the 91% of the teachers:

- 89% reported that their schools have inadequate laboratory equipment,
- 91% reported that their schools have inadequate technology resources,
- 91% reported that their school library's resources are inadequate.

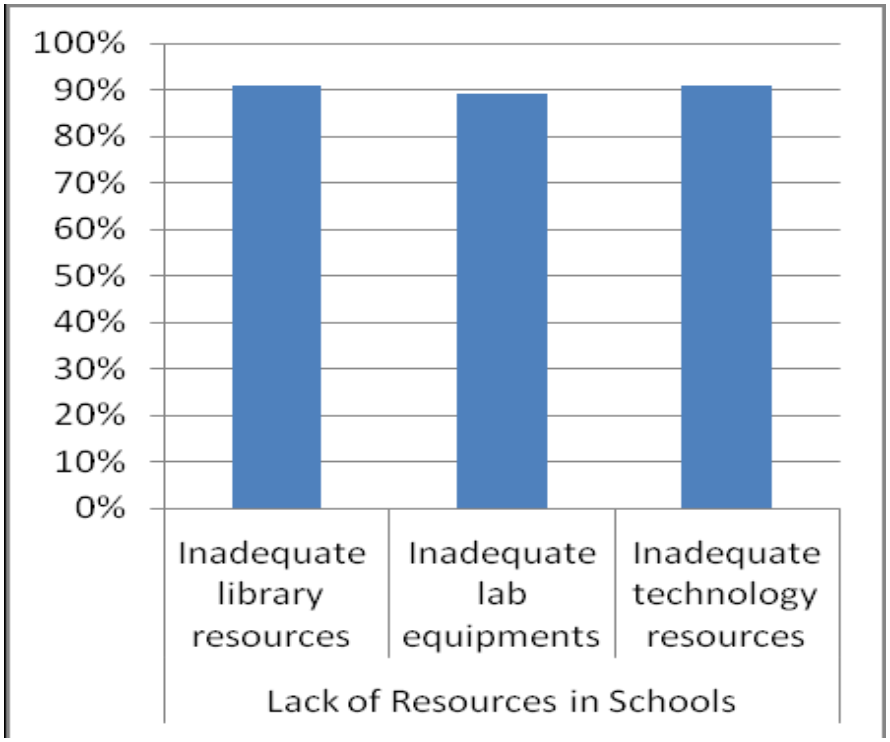

Figure 2.2: Lack of schools' resources is a factor which inhibits teachers from adopting a student-centred teaching approach in Lebanese schools

2.9 THE POST-APARTHEID CURRICULUM CHANGES IN SOUTH AFRICA

Harris (2009) considers that education is seen as an arena for change of public opinion by each successful government. Every government promises to improve education quality. A common denominator of educational policy-making is improvement of all schools, and politicians are understandably keen on securing improved standards of education.

South Africa was and is still no exception. Dhurumraj (2013) validates educational changes in South Africa by acknowledging that after 1994 the restructuring of the education system was aimed at providing all people with equal opportunities. Since 1994 several pieces of legislation were passed by government; among others, the South African Schools Act (SASA) of 1996 was enacted as law. One of the several functions of the (SASA) (1996d) Section 34 (1) is that the state provides and ensures access to quality education for all and redresses the past education inequalities among sections of those who suffered particular disadvantage. However, the imbalances of the past still have a silent but crippling effect on the present generation. Even if that law was passed, education in rural schools is still riddled with old traditional approaches of teaching. To these schools, new and innovative approaches such as learner-centredness are still a myth.

With the dawn of democracy, the new curriculum was put forward by the National Department of Basic Education as a radical move away from the school curricula of the apartheid dispensation. An apartheid curriculum which was teacher-centred had to be replaced by a learner-centred curriculum.

Dlahmini (2009:12) stresses that "*the introduction of Curriculum 2005 was seen as a move to change from a racist, apartheid, rote learning model of learning and*

teaching, to a liberating, nation-building and learner-centred outcomes-based initiative".

Despite the overwhelming support for the principles of OBE and Curriculum 2005, there are also apparent weaknesses related to the implementation part of it. The Report of the Ministerial Committee which reviewed the curriculum gave a wide critique of the curriculum. According to the committee, implementation was confounded by the following:

- A skew curriculum structure and design;
- Lack of alignment between curriculum and assessment policy;
- Inadequate orientation, training and development of teachers;
- Learning support materials that are variable in quality, often unavailable and not sufficiently used in classrooms;
- Policy overload and limited transfer of learning into classrooms;
- Shortages of personnel and resources to implement and support C2005; and
- Inadequate recognition of curriculum as the core business of education departments.

Despite three reviews since its inception, very little if anything has been achieved in terms of eradicating such weaknesses. Chisholm (2003:5) argues that *"the review of C2005 in 2000 was extremely controversial within the ANC, most of the actors in the drama were all ANC-linked and so these represented divisions over directions and who gave direction".* Chisholm (2003) identified one division whereby Kader Asmal, the then Minister of Education, proposed that revisions were necessary in the light of existing inequalities. Those inequalities included the realities of under-resourced schools which had large classes and teachers largely untrained in learner-centred education.

To the above proposals, the teacher unions and many departmental bureaucrats, C2005 became hostile to those recommendations and interpreted them as an overturning of the legacy of the first post-apartheid Minister of Education and

regarded this as a return to the past. This marked the distinction between political and bureaucratic authority and how the political authority took dominance in dictating the educational developments under the new dispensation to the detriment of the academic content of South African education.

2.10 FACTORS THAT STIFLED THE ADOPTION OF LEARNER-CENTRED TEACHING

2.10.1 Teacher qualities

Marais and Meier (2004) pointed out that since South Africa has embarked on the implementation of a new national curriculum based on OBE philosophy or approach and new schools and classroom realities have been created that require educators to reconsider existing teaching practices. The old curriculum delivery channelled educators to the path of dictating and providing information to learners for them to know it. In the new dispensation, educators provide knowledge, skills and attitudes to learners in order to understand phenomena being imparted for future purposes. This makes learner-centred pedagogy a potential contributor to desirable economic and political change. However, teacher preparation programmes have generally not adequately integrated learner-centred teaching into the curriculum. The ability for teachers to fully understand their new roles depended on the type of training and support from the experts who were to be adequately experienced in the dynamics of the new curriculum. It is for this reason that Maphalala (2006: 67) points out that "*the majority of educators and members of School Management Team (SMT) held a view that the quality of educator preparation for the new curriculum was too rushed and poorly planned".* This confirms the critical foundational flaws of successfully sustaining the OBE in South Africa, especially based on the fact that teachers are at the heart of education and the quality of education provided cannot exceed the quality of teaching offered.

Balfour (2014) argues that teacher educational programmes focus on uncritical regard for knowledge, and that the level of knowledge provided to teachers in in-service programmes is of questionable standards. IN terms of CultureShift

(2012:16), extensive research emphasises that effective professional learning opportunities should:

- be intensive, on-going, and connected to practice.
- focus on student learning and address the teaching of specific curriculum content.
- align with school improvement priorities and goals.
- build strong working relationships among teachers.

The researcher links the veracity of such a claim by denouncing the period over which such trainings are normally conducted. This argument confirmed by Naicker (2006:5) when declaring that "*exposure to various theories and engagement with epistemological issues is time consuming and requires more time."* The researcher considers the periods over which development workshops are conducted as both inappropriate and inadequate. An effective alternative is a longer, sustained and intensive professional development programme which may have more impact than a half-day event or a few after-school sessions spread throughout the school year.

Fiske and Ladd (2004:162) posit that "*training teachers often came to mean little more than bringing a single teacher from a school to a central venue for a few hours to give instructions on the philosophy and theory of outcomes based education, distribute the policy documents and explain how to plan using the new framework".*

This argument cannot be ignored when one considers that a normal teacher-training period in South Africa stretches between three to four years, yet these in-service training workshops are conducted at most for five days; in most cases not provided by specialists or people with adequate experience. This casts some doubts on the effectiveness of in-service training as part of preparing teachers for learner-centred teaching as necessitated by OBE. Thus, CultureShift (2012) considers in-service professional learning opportunities as often seen to be building on what educators learned or were exposed to in their teacher preparation, or pre-service programmes.

Belle (2007:31) asserts that “teachers are profoundly conservative in nature and are primarily more concerned about how changes will affect themselves personally in terms of their classroom and extra- curricular activities than appreciating the potential over-all benefits of the proposed new educational policy”. Consequently, when educational changes are not ideologically or pragmatically acceptable to them, they become frustrated and discouraged. Given the challenges linked to the introduction of the new curriculum in South Africa, a logical conclusion is that teachers’ frustrations have potentially throttled their ability to implement learner-centred teaching. It is for this reason that this study intends to establish the extent to which learner- centred teaching has been incorporated into South African education.

2.10.2 The quality of teacher-support programmes and orientation for Outcomes Based Education

According to CultureShift (2012:16*), “today’s educators must be prepared and supported to teach in a learner-centred environment because teacher effectiveness is the single most important factor influencing student achievement in the school”.* This is even more critical in South Africa since even prior to 1994 the quality of black teachers in particular has never been up to standard. There has been a significant discrepancy in professional learning opportunities for educators when compared to their white counterparts. Mahomed (2004:8) insists that “*the legacy of apartheid has also left us with many poorly prepared teachers and managers with regard to professional levels, subject or learning area competence, and curriculum management. C2005 has also expected schools managers and teachers to make quantum leaps with limited clarity, support and follow-through”.* Sadly, after 20 years since the introduction of Curriculum 2005 neither meaningful development nor adequate adjustments have been seen in relation to quality teachers and learner-centred approach, particularly in rural schools.

Naicker (2006:4) could not have been more correct when articulating that “*one would assume that the retraining will forefront epistemological issues since different theories of knowledge inform the old and new curriculum”*. However, despite the radical departure from the traditional curriculum to OBE, this failed to materialise and most knowledge production and training packaged practical activities in the absence

of a theoretical framework. For this reason, Naicker (2006:6) insists that *"teachers in classrooms were exposed to a week of 'training' or orientation".*

In addition to these shortfalls, the researcher believes chief among factors that have stifled teacher development are the volatile changes in curriculum, inappropriate educator support and the disruptive role played by educator unions.

2.10.3 The ineffective programmes to retrain teachers for OBE

Vavrus, Thomas, and Bartlet (2011:43) posit that *"In the midst of liberal democratic reforms and greater integration into the global economy, national and international policymakers have hailed learner-centred pedagogy as a potential contributor to desirable economic and political change. However, teacher preparation programmes have generally not adequately integrated LCP into the curriculum*". In South African context, this assertion has been noted by, among others, Taylor (2007:3), who argues tha*t "improvement programmes aimed at empowering teachers for Curriculum 2005 never succeeded"*. The first programme of this nature was the Imbewu Project (1998 to 2001). In this project, principals and teachers from the Eastern Cape were trained in the pedagogical methods of Curriculum 2005. However, despite an enthusiastic response to this programme, pupil testing showed no improvement in learning outcomes.

From 2000 to 2002, the District Development and Support Project were conducted. This aimed at improving district and school functionality in 453 primary schools in four of the poorest South African provinces. The focus was on classroom teaching of Mathematics and language. Although test scores in project schools improved over the period of intervention, there was no control group thus prohibiting a robust evaluation of the success of the project.

From 2000 to 2004, the Quality Learning Project was conducted; this was aimed at improving district and school functionality in 524 schools in 17 districts. Kanjee and Prinsloo (2005) argue that the programme was effective in influencing school leadership and learner outcomes at matric level.

The Dinaledi Programme has been running since 2001 and provides resources and other forms of support to schools identified as having promise in the area of Mathematics and Science. A World Bank (2010) evaluation of the project found that it had had a significant impact on the number of learners enrolling in and passing Mathematics and Science in Dinaledi schools relative to matched comparison schools.

2.10.4 The quality of district officials' support

In South Africa, as Chinsamy (2002) contends, the National and Provincial Department of Basic Education have successfully formulated empowering educational policies but their implementation has been questionable. The gap between policy formulation and implementation has been regarded as the primary reason for the failure of transformation in education (Chinsamy, 2002; Jansen, 2002). Bantwini and Diko (2011:229) cite The South African Department of Basic Education (2005) also acknowledges that in some districts there has been no meaningful support for some time. This is particularly true in rural and historically disadvantaged areas. Even if support is available, it is often fragmented and uncoordinated and to unite it into cohesive practice that works is a challenge.

Further criticism on the role of district officials is noted by Bantwini and Diko (2011), who argue that despite the consensus on the vital role played by districts and their officials, some literature shows that advocates against the local school districts also exist. To other critics, as Marsh (2001) indicates, districts have become overly politicized and unresponsive to the public, teachers, and students. This can no longer be denied in the South African context given the widely reported unethical and unprofessional practice whereby appointment of education officials is based on political affiliation, a practice which has further deteriorated to an ominous selling of senior positions within the Department of Basic Education.

A further observation about districts and their officials was made by Spillane (2000), who found that district officials sometimes contribute to the non-implementation of new reforms by the teachers, especially when they do not fully comprehend the vision of the reforms. This is echoed by De Clerq (2008) who notes that departmental or

district support capacity is also stretched by the new OBE system because the majority of provincial or district officials are themselves not familiar with OBE and the competences, values and culture required to implement it. This is an obvious outcome of promotion based on political affiliation. Hence, de Clerq (2008) reaffirms that educators and their unions have repeatedly complained about the lack of effective district or senior management support for the implementation of curriculum such as learner-centred teaching, and other and assessment policies (South African Democratic Teachers Union (SADTU), 2005).

De Clerq (2008:15) posits that "*Outcomes-based education (OBE) requires educators to negotiate the significant changes in their work – from transmitting a syllabus-based curriculum to facilitating and developing a learner-centred curriculum, which is sensitive to learners' context*". This supports the notion that district officials may not be in a position to understand the environment where actual teaching and learning take place.

The South African Department of Basic Education (2005) also acknowledges that in some districts there has been no meaningful support for some time. This is particularly true in rural and historically disadvantaged areas. They also note that even if support is available, it is often fragmented and uncoordinated and to unite it into cohesive practice that works is the challenge (DoE, 2005). De Clerq (2008:15) noted that "*unlike in many Anglophone countries which introduced some form of OBE, the change in teacher work, professional identity and status was incremental over a few decades and there were strong support systems and reasonable material and human resources*". The situation in South Africa, however, is very different as the school support capacity rarely exists in low-functioning schools and is made worse by a tradition of poor collegiality and lack of respect among staff in many schools.

2.10.5 The complications caused by the frequency of curriculum adjustments from 1996 to 2011

In 1998, Department of Basic Education South Africa adopted a policy which aims to change the curriculum in all schools, (DoE 2000). This programme was first called “Curriculum 2005” because it was to be fully in place by the year 2005.

The DOE, (2000) reviewed Curriculum 2005 in 2000. The report recommended some changes to Curriculum 2005 but supported the continuation of OBE. This review was being repeated within two years of implementation and the recommended changes were to be put into practice by the educators even before the mastery of the original 2005 Curriculum. Makhwathana (2007:32) stresses the view that *“when a new policy, like a new curriculum is introduced in a school, experienced and new educators all need to get used to it and be trained in the new system”.* According to Fullan (1982), the implementation of educational change should involve a three-pronged multidimensional approach, namely, (1) the development of teaching materials, (2) development of teaching approaches, and (3) alteration of teacher beliefs.

The problems that followed educational innovations in South Africa are a resonating testimony that Fullan’s and Langworthy (2013) three-pronged multidimensional approach were not observed in the South African context. This is confirmed by the volatile curriculum adjustments that bungled the post-1994 educational arrangements in South Africa. This accounts for, among other things, the strangling of educators’ experiences; hence, the growth in their expertise was compromised. Soon after the commencement of C2005 in 1997, it became apparent that adjustments to C2005 were necessary.

Chisholm (2005) enlightens the process which included consultations with the teacher unions, public hearings held in 2001 as well as the presentations within the main organs of government that ultimately resulted in the Revised National Curriculum Statement (DoE 2002a) becoming an official policy in April 2002.

In response to the recommendation of the Ministerial Committee to streamline and clarify the curriculum policy, the national Curriculum and Assessment Policy Statements (CAPS) have been developed for each subject listed in the National Curriculum Statement (NCS) for Grade R to 12. The department acknowledges that

CAPS is not a panacea to implementation challenges. It asserts, though, that the simplification of the curriculum will go a long way in assisting with overcoming other barriers to quality education. Waldburger (2014) argues that CAPS, is a tacit admission that OBE - and, by implication, our entire education system – has significant problems.

De Clerq (1997:140) argues that *"the manner in which the curriculum changes have been implemented will be counterproductive to the need to redress and actually benefit the privileged schools. Could it be true that, the curriculum changes only feed and reinforce the division that have crippled and continue to cripple the development of a post-apartheid society?"* An appropriate response to this question should be drawn firstly from the quality of teachers that apartheid created, secondly, from the quality of support and development given to teachers in order to implement curriculum innovations and, finally, from the rapid adjustments to which the new curriculum has been subjected. In terms of rapid adjustments, The Zenex Foundation (2013:1) affirms that *"continuous policy revisions, particularly at curriculum level, have resulted in extreme challenges with implementation as policies are not given sufficient time to be embedded and adapted on the ground"*. This curriculum volatility has denied teachers in particular time to internalize and to grow in experience, and in the process have developed a mind-set that every new innovation is on trial basis. This is further complicated at times by mixed and contrasting instructions from district officials who themselves have inconsistent understanding of curricular innovations. Hence, Bloch (2006:9) states *"Not only are there key policy slippages, for example between the education and training (labour) systems, or between the various branches of the Department of Basic Education, but the very structure of the relationship between national (policy) department and provincial (delivery) departments leads to highly unequal and inconsistent outcomes*".

2.11 THE ENVIRONMENTAL FACTORS THAT AFFECT EFFECTIVE TEACHING IN SELECTED SCHOOLS

Struwig and Stead (2007:12) emphasise that, *"often the behaviour of individuals are inextricably related to the environment in which they are situated"*. According to

Lombard and Grosser (2008:574), a major factor contributing to deficient critical thinking abilities can be connected to the mediation of social experience within the socio-cultural environment in which a learner grows up. For this reason, the researcher considers it rational to briefly discuss the environmental context of the selected schools in order to establish their relevance to effective learning, critical thinking and, particularly, their preparedness to respond to learner-centred teaching.

2.11.1 The role of school environment in determining quality education

Colen (2013) refers to the school environment as the prevailing socio-cultural behaviours that are practiced by the school. The environment refers to the school setting in-terms of the physical plant, the fairness and adequacy of disciplinary procedures as well as the academic environment. These involve the management of the school, sport, beliefs, rules and pride that learners have in their school. School environment arises from the various complex transactions that characterize the daily classroom as well as school life; this is influenced by the underlying, institutional values and belief systems, norms, ideologies, rituals, traditions and practice that constitute the school culture (Myint & Goh, 2000).

In an investigation conducted by Warnich and Meyer (2013), a revelation was made: in contrast to urban schools, panel discussions, learner-centredness and inquiry learning are seldom applied as teaching and learning strategies in rural and township schools. Most of these (black) schools are historically the worst off in respect of the availability of adequate physical resources (libraries, computers, electricity, photocopiers and papers), the level of training and personal skills of teachers and the availability of quality learning and teaching support material. Hence, Warnich and Meyer (2013) are convinced that such limitations will definitely impact negatively on the teachers' enthusiasm to apply any learner-centred instruction strategies.

2.11.2 The impact of environmental aggravation in rural educators

Starr and White (2008) found that in rural schools teachers, and leading teachers in particular, face many of the same issues as their metropolitan counterparts. However, they once again identified real or perceived problems distinctive to rural teaching, including personal and professional isolation; inadequate access to professional learning and teaching resources; high visibility in the community; requirements to teach 'out of area', and early professional advancement to positions of leadership without preparation at an earlier stage in their careers. It is important to reiterate that all schools selected for this study were drawn from a remote and rural background. Research has always emphasized the existence of a gap between rural and former

Model C schools. By former Model C schools, Mncube (2008) refers to those schools which, during apartheid era in South Africa, had accepted only white learners. Riley, Craig, Poston, Saunders and Flynn (2000:5) uphold that, "*rural education is often not an immediate priority for governments owing to the remote nature of rural schools governments give less weight on issues of low quality education in rural areas than to similar issues in urban schools".*

Coetzer, Jordaan and Peret (2005) listed three main arguments that can be made to explain why rural education has been a low priority area:

- Urban constituencies are more organised and vocal than rural ones and have succeeded substantially in monopolizing attention.
- The universal framework employed in government and policy documents is insufficiently sensitive to the specific conditions and needs of the rural poor, especially those of women.
- Education cannot compensate for poverty and inequality, and social inequalities need to be addressed before rural education will change.

For these reasons, the researcher insists that South Africa is not an exception from this consideration. Furthermore, it confirms the integral inequalities between urban and rural schools which in turn compromise the ability of rural schools to implement the educational innovations introduced by the national government.

Harande (2009:1) posits that "*rural neglect brings negative consequences such as exodus of rural dwellers to urban areas, with resulting problems of unemployment, crimes, prostitution, child labour, insecurity, money laundering, bribery, poverty, proliferation of shanty living areas, spread of diseases, and overstretching of the facilities and infrastructures in the urban areas".* This indicates a serial impact imposed by the environmental differences in every dwelling and the need to arrest such differences.

2.11.3 Educators' disinclination to serve in rural schools

Political changes in South Africa, in particular the scrapping of the Group Areas Act, have given added momentum to urbanization. Many learned and professional people mostly teachers left rural places for urban areas. This meant that the majority of teachers from these selected schools are not residing in the communities in which they are teaching. White (2011) further discovered that many pre-service teachers feared that as rural teachers they would lack access to resources, and face isolation and cultural barriers. These fears left many of them unwilling to consider a future rural career or even to trial a teacher education incentive programme. A fact espoused by Riley et al. (2000:4) confirmed that *"the effectiveness of schooling in rural communities is further reduced by resource inequities and the unwillingness of teachers to be stationed in remote areas*". A typical response from Jon Lewis of the South African Democratic Teachers' Union when responding to the research team (Coetzer et al. 2005:115) was as follows: "*A common strategy is to commute to the school from an urban centre (or at least the nearest small town").* This addresses some of the problems, but has a number of disadvantages:

- High transport costs and wear and tear on vehicles (this is moderated by the organization of lift clubs).
- More seriously, it means that educators' commitment to the school and the wider community is necessarily reduced because of the reduced time available. Extramural activities may suffer. Also, long distances, poor roads and inclement weather are likely to impact on attendance.

This context is a mockery to Umbach and Wawrzynski (2005) whose assertion is that *"the educational environment created by teachers' behaviours, beliefs and attitudes has a dramatic effect on learners' learning and engagement".* Bryson and Hand (2007:352) and Mearns, Meyer and Bharadway (2007:7) concluded that "*if a teacher is perceived by learners to be more approachable, well prepared, willing to help and sensitive to their needs, learners tend to get more committed, hardworking and open to express their own opinions".* These confirm that learners feel part of the classroom

activities and they get engaged more if they are supported by teachers who establish inviting learning environments.

An immediate impact from most rural teachers' poor commitment is their notable challenge of keeping time. Punctuality in terms of their arrival and departure from work is compromised by, among other things, the distances they have to travel, the unreliable transport means associated with the rural environment, poor commitment which is supported by the powers enjoyed by teachers' unions as well as sub-standard management prevalent in South African schools.

Another symptom of poor commitment is raised by Spaull (2012), who notes that currently teacher absenteeism amounts to approximately one month per annum and learning is compromised. Teachers need to be in class on task. He further posits that there is a need for increased information, accountability and transparency across the system. This includes the levels of the district, the school, the classroom and even learners.

It is in this context that Manqele and Dichaba (2012:14) argue that "*rural school children in some provinces in South Africa have not all been reached by dictates of justice. Needless to point out that the majority of government officials in South Africa are black and there are a number of doable things (schools for children of rural villages among others) that the same government should have attended to as issues of delayed justice, if not to eliminate the ugly face of injustice practices and policies of yesterday".*

2.11.4 The effects of redeployment policy

One of the controversial policies in South African education post-1994 is the redeployment of educators. This means that educators should be moved to schools where their services are needed. However, need is determined by the school's enrolment. Better learning conditions associated with urban former Model C schools meant that many parents have moved their children to these schools. Surty (2011), confirms that the general perception of all participants was that former Model C schools were able to offer their learners a *variety* of *better* and *useful* resources,

facilities and equipment. Hence, as early as mid-1997 it was clear that there were serious flaws in the implementation of the plan which was to have substantially re-shaped the teaching resource base of South African schools. In many areas the situation was actually worse than it had been in 1995. Some staff members had taken buy-outs, and were not replaced. This was most often the case in the most disadvantaged areas which had expected dramatic improvement. Though there are no reliable statistics, it is probable that there are fewer teachers today in South Africa than there were in 1995. In April, May, and June, tens of thousands of SADTU members in several provinces rallied and marched to highlight their frustration with slow and bungling progress. In early June, the SADTU leadership took the unprecedented step of writing a public letter directly to the Minister of Education, strongly stating their displeasure with the process (Chudnovsky, 1998).

2.11.5 The shortage of science educators in rural schools

Rivkin et al., (2005) opined that low-income and minority students are more likely to have inexperienced teachers and to be at the receiving end of greater turnover rates for teachers. As a result, they call for policies designed to ensure these students are taught by more seasoned teachers. In the South African context, the sad and unfortunate result is that many better qualified educators, in particular those who offer scarce subjects like Mathematics and Physical Sciences, are moved to urban areas. Therefore, one apparent challenge of rural schools is to keep and maintain suitably qualified educators, especially for the scarce subjects. White (2011:1) noted that “Globally, many rural schools find it harder to attract and retain quality teachers than their urban counterparts”. The situation could be further understood by what the Department of Basic Education (KwaZulu-Natal) (2013) reported, when confirming that by January, only 98 of 1 118 posts remained unfilled. These were vacant only because teachers had refused appointments at rural schools and because the Department was obliged to consider the curriculum needs of schools with vacancies. It is for this reason that this study’s participants were drawn from Physical Science educators. KwaZulu-Natal is one such province where teachers resist working in rural schools. Jansen (2013:1) confirms that “despite the hundreds of millions spent on university bursaries for new teachers, the KwaZulu-Natal Education Department

may have to continue to employ unqualified maths and science teachers because their suitably qualified counterparts are failing to take up vacancies in rural schools".

2.11.6 The role of incentives

To address the challenge of attracting educators for scarce subjects facing rural schools, Surty (2011:14) suggests that *"in order to attract teachers to rural areas, we need to provide a rural incentive and a skills incentive for scarce skills".* Attempts to provide incentives for rural schools never materialized; one such attempt was the so called rural allowance. This is besides the fact that as early as 2008 the then education minister Naledi Pandor allocated R500 million to provinces for the implementation of the allowance. KwaZulu-Natal received R150m of that allocation, but the incentive did not reach all the identified schools, said Alan Thompson, deputy president of the National Teachers Union (*Daily News*, 2014). In terms of this allocation, qualifying teachers were supposed to get R1500 per month.

However, due to errors, abuses and possible fraud in the payment of rural allowances to non- qualifying teachers, the Department of Basic Education had to ultimately cancel this incentive. This is despite the fact that other departments have successfully implemented rural incentives. Dehaloo and Schulze (2013:227) affirm that *"the Department of Health offers its employees scarce skills and rural allowance in contrast to the Department of Basic Education (DoE)* (Department of Public Service and Administration 2009). Thus, the researcher could attest to the challenge of obtaining and retaining the services of suitable qualified teachers for the so called scarce subject like Mathematics and Physical Sciences in rural schools. This is, however, a global challenge; hence White (2011:1) confirmed that "*Australia's remote, rural and regional schools are frequently staffed with young and inexperienced teachers".*

2.11.7 Challenges facing rural schools' principals

According to the Department of Basic Education (2008:62*), "research on school improvement shows that the two main factors influencing the quality of education are classroom practice and leadership".* These two factors are interdependent thus equally important. In addition to sub-standard teaching, rural schools are subjected to some compromised quality of management. De Ruyck (2005:9) reiterated that *"It is far more difficult for a principal to be an effective instructional leader in an environment where a principal has limited access to professional development and who already wears so many hats".* Furthermore, it is far easier for urban principals to take night courses at a university within their own city than it is for rural administrators to travel on a regular basis. Coetzer et al. (2005:109) have noted that by far the majority of principals in KwaZulu-Natal and the Eastern Cape (59% and 51% respectively) have a college diploma. In Limpopo, 27% of principals have a college diploma. And in Limpopo, a far higher percentage (31%) than in either KwaZulu-Natal or the Eastern Cape has a Bachelor's degree. While this undermines the professional and academic imperatives linked to quality education generally, the situation is worse to less comfortable in rural schools. An implicit conclusion is that most skilful and adequately qualified principals prefer to work in well-developed urban areas.

Unlike in urban environments, rural principals have fewer opportunities to network with colleagues in face-to-face environments. While there are, of course, several means of communication that can help to alleviate this feeling of isolation, email and the telephone cannot fully replace regular face-to-face contact amongst colleagues. Barth (1990:146 as cited by De Ruyck, 2005) supports this point by writing: *"In order not only to survive but to flourish, principals need to be able to discuss promising school practices without fear of violating a taboo; they need to learn to share problems without worrying about appearing inadequate".* In short, principals need to talk regularly with other principals who share similar circumstances.

De Ruyck (2005:10) further conjectures that "*rural principals' opportunities for professional development are limited by budgetary concerns. Professional development budgets for administrators in rural areas are often absorbed more quickly because there are additional costs that must be covered including travel and*

lodging". To be noted also is the fact that all selected schools were granted a no-fee status. Therefore, their only income is the departmental allocation which is calculated in accordance with the number of learners in that particular school. As mentioned, most affording parents send their children to well-resourced urban schools. This has dramatically reduced learner enrolments in rural schools which also meant the reduction of the departmental funding to rural schools. Unlike in urban schools, teachers from rural schools have to travel longer distances to attend workshops and other development courses. This puts further strain on their limited funds. Waldburger (2014) notes that middle class homes are able to navigate the progressive world as they have already acquired the 'cultural capital' necessary to do so. On the other side, working class children enter the system and find themselves lost in a world in which the rules and purpose of the process are spoken in an implied and hidden language to which they have never had access.

2.12 THE IMPACT OF ENGAGEMENT

Bakker and Demerouti (2008:209) refer to work engagement as *"a state that demonstrates vigor, dedication and absorption in the job".* The researcher considers this psychological condition vital in enabling teachers to endure the taxing work conditions under which rural teachers work.

Teaching in rural areas in South Africa is particularly challenging (Bloch, 2010:6; Panday & Arends, 2008:22). These challenges include: a lack of clean water, proper sanitation and basic infrastructure; overcrowding in classrooms; lack of teacher support; student ill-discipline; lack of parental involvement; violence at school; and poor resources (Davids & Makwabe, 2007:1; Guttman, 2007:14-15; Karp, 2007:5; Mohlala, 2010:2). Cohen (2009:7) confirms that teachers in many rural schools work under difficult conditions in comparison to their counterparts in the more affluent areas.

In a study conducted by Dehaloo and Schulze (2013) to investigate the influence of job resources and job demands on the work engagement of secondary school teachers in the Ilembe District, a rural area in KwaZulu-Natal, it was revealed that

the work engagement of the secondary school teachers in the rural district of ILembe was poor as illustrated by expressed wishes for early retirement or resignation, frequent absenteeism, depression and frustration which resulted in conflict with management.

Dehaloo and Schulze (2013:226) maintain that *"job resources and personal resources are inter-related"*. They uphold that resources motivate teachers to a greater or lesser extent for work engagement which, in turn, influences teacher performance. Work engagement affects job resources and personal resources since teachers can perform in such a way that they may improve their job and personal resources.

Several teachers expressed dissatisfaction with the OBE system and the significant work associated with its administration and with assessment. This discloses the attitude held by rural school teachers towards OBE, partly due to its learner-centredness with its related demands. In addition to OBE, the teachers referred to the students and their parents as follows:

- Professional parents, lawyers, politicians who think they know a lot and want to dictate to teachers, are very demotivational; and
- It is also demotivational when parents complain about teaching and teachers since some of them know very little about what goes on in school.

Ololube (2006:6) maintains that motivation at work is enhanced by psychological rewards which include meaningful and varied work, task autonomy, participatory decision-making, positive feedback, collaboration, administrative support, reasonable workload, adequate resources and pay, and learning opportunities providing challenge and accomplishment. The question is: To what extent these factors play a role in the school context in South African? Even worse, how do rural and under-resourced schools deal with such challenges?

The following table from a study by Dehaloo and Schulze (2013:235) illustrates the job demands that were investigated which included work pressure and workload, as well as the emotional and mental demands of the various roles that the teachers were required to play. To be noted is the fact that their study was conducted in a rural ILembe District in KZN. It is the initial quantitative phase of the study which used 100 educators from five secondary schools.

Table 2.3 An illustration of teachers' job demands (Dehaloo & Schulze, 2013:235)

ITEM	DISAGREE %	NEUTRAL %	AGREE %
Teachers at my school are happy with their workload.	48	26	26
The negotiated 1:32 teacher-student ratio is adhered to at my school.	75	15	9
Students from larger classes perform well at my school.	73	21	5
In my school teachers perform several roles in addition to classroom teaching (such as care givers, social workers or	11	17	72
Student violence seldom occurs at my school.	29	22	49
I agree that students with special educational needs are placed in the same class as the others.	65	14	21
Teachers at my school are able to work well under pressure.	23	21	55
Teachers at my school easily handle students with special educational needs.	51	30	19
I agree with the fact that older students are placed in the same classes as the normal age cohort group of students.	56	15	29

Traumatization because of intimidation is absent at my school.	35	27	38
Drug abuse is not a problem at my school.	61	20	19
Teachers are well-prepared to deal with problems of substance abuse at my	49	24	26
Teachers are well-prepared to deal with criminality at my school.	60	18	22
Teachers are satisfied with the abolishment of corporal punishment at my	59	31	10
Safety measures at my school contribute to the smooth running of my school.	37	27	35
IQMS as an evaluation tool for teachers is well-received by teachers at my school.	53	28	19
IQMS is carried out in a transparent manner. in my school.	22	24	54
IQMS has empowered me to improve my teaching practice in the classroom.	40	33	26
My students are generally well-disciplined.	36	22	42
Teachers at my school are happy with the assessment policies of the DoE.	43	27	30
The schools' medium of instruction supports student performance at my	32	31	37

In terms of their diagnostic analysis of the above table, the job demands of the teaching profession emerged as one of the most important aspects of the teachers' work that could inhibit work engagement. The table further indicates the following as most significant: large classes and unsatisfactory teacher-student ratios that were demanding; handling students with special educational needs or older students in the same classes as the others; and challenges related to substance abuse and criminal activity. The percentage of the teachers who were unhappy that they could not use corporal punishment to discipline students is 59%. Regarding Integrated Quality Management System, more than half of the group (53%) did not think it was well

received by teachers as an evaluation tool. The above findings from Dehaloo and Schulze (2013) reflect a combination of rudimentary challenges faced by rural schools in particular which account not only against their work engagement but also their ability to fully embrace the educational innovations as required to improve South African education.

2.13 CONCLUSION

The purpose of this chapter was to conduct a literature review of the learner-centred approach as a teaching strategy. It began with a detailed conceptualization of the concept of learner-centred teaching by looking at the definitions, purposes and other implications related to learner-centred teaching pedagogy. It also evaluated learner-centred teaching in terms of its advantages and challenges related to its implementation. Furthermore, it focused on the learner-centred approach as an integral part of South African educational innovations post-1994. Thereafter, it scrutinised the hurdles left by the apartheid regime which stifled the implementation of educational innovations in terms of the possibilities of implementing a resource-dependent curriculum in a poorly resourced environment by highlighting the role of resources in implementing learner-centred teaching. A conceptual framework and educational theory upon which the learner-centred approach evolved was also discussed. Furthermore, reviews of environmental factors favourable to the learner-centred approach were investigated with an intention of revealing the challenges faced by rural schools, particularly those selected for the study. This included attempts at empowering educators for current and future challenges facing the quality aspect of South Africa's education.

From this literature review, the concept of learner-centred teaching represents an apparent paradigm shift from traditional teaching methods by focusing on how students learn instead of how teachers teach. This shift blurs the distinction between teachers and learners by changing the traditional role of teachers from being the sole authoritarian to learners in search of knowledge. Hence, teachers become facilitators of learning.

In line with the educational innovations in South Africa, a learner-centred approach becomes the best practice through which the aims and aspirations of attaining higher standards, increasing achievement and improving schools could be realized. However, the aforementioned challenges reviewed and discussed in relation to the South African context do not suggest that rural schools are in a condition to fully exploit a learner-centred teaching approach. Hence, Hoadly and Jansen (2005) claim that there is little chance of OBE becoming successful in poorly resourced schools.

The chapter concludes by assessing the level of work engagement among educators with particular focus on rural schools, as well as disingenuous and futile efforts in addressing South African teachers' work disengagement.

CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter provides a description of the research design. The chapter also describes the methodology used to investigate the research question on which the study is based, namely; to what extent educators in rural and underdeveloped schools have managed to implement a learner-centred teaching as part of the curriculum innovation. This chapter also focuses on the discussion of data collection instruments, the study population, and the sampling and data analysis techniques used. Furthermore, it explains how the study was piloted to investigate the feasibility of the project. Finally, the profile of the schools where the study was conducted has been provided.

3.2 RESEARCH DESIGN

Henning, Van Rensburg and Smit (2004:36) define research design as *"a conceptual imagery or an architectural impression of what the product of research is expected to look like".* A research design determines and outlines the methods and steps a researcher follows in finding out information about the area he or she is investigating (McMillan & Schumacher, 2010). Similarly, Nesane (2008:56) refers to research design as "*a plan for selecting subjects, research sites and data-collecting procedures to answer a research question and its main function is to enable the researcher to anticipate what the appropriate decisions should be so as to maximize the validity of the eventual results".*

Muzumara (1998:46) further defines research design as *"the organization, plan, or procedure by which an investigator intends to answer research questions".* The design is also intended to control errors of procedures and interpretation. The structure of the design specifically delimits the kind of observations which can be made, the persons from whom data can be collected, and the kind of analysis it is possible to make within the framework and the form of the data. In this study, the schools investigated are those which are still disadvantaged in that they are rural,

poorly resourced and situated in a remote environment. The emergence of such schools came as a result of the Bantu Education Act of 1953. The Act formalized the divide in educational opportunities for the different racial groups, and was implemented in order to keep black education at an inferior quality to white education. In terms of this policy, funding for education was based on race with the schools assigned to white children receiving the most funds, followed by funding for coloured and Indians schools, and finally black education was given the lowest priority. Sadly, these types of schools still exist even during this current democratic government. Hence, The Emerging Voices (Mandela Foundation, 2005: xii) argues that *"the historical development, contours and consolidation of power relations between urban and rural, and within rural areas, have resulted in neither formal nor substantive equality for people living in rural areas".* This explains the difficulties which still exist in equalizing education between affluent and poor communities.

Out of 34 current schools in the Dannhauser Circuit, of which 11 are secondary schools that offer Physics Science, only 2 are former Model C schools. The rest are rural and underdeveloped schools. Data was obtained mainly from the educators and learners as well as the documents found in the same schools. Van Manen (1990:72) declares that "*the purposes of phenomenological inquiry are description, interpretation, and critical self-reflection into the 'world as world' ".* Therefore, to ascertain the credibility of the study findings, all participants of this study were drawn from 6 of the 11 secondary schools that are under the same environment which is both rural and under developed.

Lester (2004) affirms that phenomenology is concerned with the study of experience from the perspective of the individual, 'bracketing' taken-for-granted assumptions and usual ways of perceiving. As the study was aimed at evaluating the extent to which educators in rural schools have managed to apply the learner-centred approach, the phenomenological design was perfectly appropriate to describe the experiences of the participants from their own perspectives. This suited the researcher's intention whose concern was to establish the social and psychological phenomena from the perspectives of people participants. It is for this reason that the setting and the focus of the study were the educators and learners from the rural schools.

As pointed out and substantiated in chapter two (see section 2.11) that challenges experienced by rural school educators are related to environmental causes, the phenomenological design could be a more appropriate and rational option to understand the social and psychological perspectives and experiences of the education role players in the actual setting, which in this regard is the rural environment. Rogan and Grayson (2003) hold the view that the process of change is context-specific, hence implementation must take into account the context of a particular school with regard to its teachers, pupils, leadership and environment. Hence, Ndamba (2013:37) concludes that *"implementation of a policy change depends on the context of a country or a specific school*".

3.3 RESEARCH METHODOLOGY

Rajasekar, Philominathan, and Chinnathambi (2013) refer to a research methodology as a systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called 'research methodology'. It is also defined as the study of methods by which knowledge is gained. Its aim is to give the work plan of research.

Moody (2002) maintains that empirical research methods can be divided into two categories:

- Quantitative research methods: such methods collect numerical data (data in the form of numbers) and analyse it using statistical methods.
- Qualitative research methods: such methods collect qualitative data (data in the form of text, images, sounds) drawn from observations, interviews and documentary evidence, and analyse it using qualitative data analysis methods.

Although these two types of methods have different strengths, the researcher has noted that it is feasible to use them together. However, Bazeley (2002:4) warned that "*when methods are mixed without careful consideration of the particular assumptions or rules and expectations regarding their conduct, corruption of those*

methods can occur such that results obtained by them become subject to question". In order to make an informed decision in terms of selecting the most appropriate method, the researcher resolved to start by comparing and contrasting the two main research categories.

3.3.1 Reasons for choosing qualitative research methodology

Henning (2004:2) states that *"the distinction between the qualitative and the better known quantitative paradigm lies in the difference between the quest for understanding and for in-depth inquiry"*. In a qualitative approach, the researcher stresses the socially constructed nature of reality, the intimate relationship between the researcher and what is being studied and the situational constraints that shape inquiry (Denzin & Lincoln, 1998:8). Qualitative researchers seek answers to questions that stress how social experience is created and given meaning and emphasise the value-laden nature of inquiry. In contrast, the quantitative approach emphasises the measurement and analysis of causal relationships between variables and is purported within a value-free framework (Denzin & Lincoln, 1998). Hence, through the quantitative approach the researcher could hardly delve in depth into complexity and the processes that define contextual challenges that are facing South African education.

The other reason for choosing qualitative method was the fact that researcher intended to capture the genuinely and distinctive human dimension of education as portrayed by the participants drawn from the under-resourced schools which cannot be captured by statistical generalizations and causal law. Qualitative approach accepts that the meaning of any event is constructed with different interpretations arising from differing points of view. This can only be achieved through the use of the qualitative approach and not the quantitative approach.

"Qualitative approach maintains that the situational context is important in understanding behaviour, and that human actions are strongly influenced by the setting in which they occur" (McMillan & Schumacher, 2010:322). As indicated, the setting in this regard was the rural under-resourced schools in Dannhauser Circuit and the participants were the teachers and learners who were observed engaging in

teaching and learning activities. By describing the social setting of the participants the researcher attempts to ensure that their views are not isolated from their context. Struwig and Stead (2007:12) emphasise that, “often the behaviour of individuals are inextricably related to the environment in which they are situated”. Therefore, for the study to fully relate to the challenges faced by rural schools’ educators in implementing learner-centred teaching, it was more appropriate to choose a qualitative research approach. Denzin and Lincoln (1998:2) provide the following generic definition of a qualitative study stating: “Qualitative research is multi-method in focus, involving an interpretive naturalistic approach to its subject matter”. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them. Qualitative research involves the studied use and collection of a variety of empirical materials - case study, personal experience, introspective, life story, interview, observational, historical, interactional and visual texts - that describe routine and problematic moments and meaning in individuals’ lives.

Qualitative research methods basically responds to questions that require reasoning, explanation and description of human behaviours, opinions and experiences. And, that type of information is difficult to obtain through quantitative methods of research. To respond to the purpose of this study, which is to investigate learner-centred teaching in rural schools, qualitative research was therefore the most suited. This is because qualitative research studies things in their natural settings, attempting to make sense of or to interpret phenomena in terms of the meaning people bring to them.

The researcher believes that using qualitative methods complements the study’s design, that is, a phenomenological design which is concerned with the study of experience from the perspective of the individual, ‘bracketing’ taken-for-granted assumptions and usual ways of perceiving (Lester, 2004). This forms a critical requirement of this study given the fact that learner-centred education refers to a wide variety of educational programmes, learning experiences, instructional approaches, and academic-support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students and groups of students.

The researcher opted for qualitative approach in order to satisfactorily answer the research questions posed in this study: How do educators in rural and underdeveloped schools deal with learner-centred teaching as part of the curriculum innovation? (See section 1.3). To respond to this question, the participants had to describe, explain and provide some reasons of their behaviours. Hence, the researcher could not merely skim across the surface. The researcher had to dig deep to get a complete understanding of the phenomenon being investigated. The researcher had to collect numerous forms of data and examine them from various angles to construct a rich and meaningful picture of a complex, multifaceted situation.

Mertens (1998:160) maintained that *"the key words with qualitative methods include complexity, contextual, explanations, discovery and inductive logic*". By employing the inductive approach, the researcher can attempt to make sense of a situation without pre-empting expectations. This better depicts educational innovations in South Africa which are marked by chopping and changing of policies and practices. The researcher considered the qualitative research method as the most appropriate methodology to explore and explain the reasons behind why rural schools struggle to fully grasp and implement a learner-centred approach as one of the curriculum imperatives. This is further explained by Marshall and Rossman (1999:2) who aver that "*… qualitative researchers delve into natural settings rather than in laboratories and use multiple methods for examining the topic of interest".* Thus, *"qualitative research is pragmatic, interpretive and grounded in the lived experiences of people".* The researcher was, however, aware that qualitative research designs differed from quantitative research designs in that they usually do not provide the researcher with a step-by-step plan or fixed recipe to follow. However, the fact that in this study the researcher started with a tentative design which developed as the enquiry progressed; it allowed the researcher to include variables that were not anticipated prior to the start of the empirical research.

3.3.2 The theoretical underpinnings of qualitative research

The word theory has the same meaning as the word paradigm in qualitative research, in that both refer to a mind-set. However, Denzin and Lincoln (2011) maintained *that "qualitative research is difficult to define clearly. It has no theory or paradigm that is distinctively its own … Nor does qualitative research have a distinct set of methods or practices that are entirely its own*".

Nevertheless, Krauss (2005:760) maintains that *"qualitative research is based on a relativistic, constructivist ontology which contends that there is no objective reality; rather, there are multiple realities constructed by human beings who experience a phenomenon of interest".* As a result, the researcher did not regard the participants in this study as objects, but as human beings who can speak and think for themselves and who can define things from their own points of view. Segoe (2013:158) alludes to the fact that *"qualitative researchers try to construct reality from the standpoint of participant perspectives"*. They do not apply predetermined definitions or ideas about how people will think or react. This necessitated the researcher to start from the perspectives and accounts of the participants and proceed until the point where he was able to reach his own conclusions on the topic under investigation. This development resembles what Vygotsky (1978) referred to as the zone of proximal development. Similarly, in this study the researcher had to co-operate with the participants and mutually share their perspectives and understanding of the phenomenon under investigation so as to achieve the objectives of the study. Hence, the underlying approach in this study is that both the researcher and the participants had a reciprocal duty to construct the findings of this study. The veracity of a constructivist approach in this study is aptly captured by Creswell (2003:8), who conjectured that:

> *Often these subjective meanings are negotiated socially and historically. In other words, they are not simply imprinted on individuals but are formed through interaction with others (hence social constructivism) and through historical and cultural norms that operate in individuals' lives*.

Thus, constructivist researchers often address the processes of interaction among individuals. They also focus on the specific contexts in which people live and work in order to understand the historical and cultural settings of the participants.

Meaning sought after in this study which was to find out the extent to which teachers in the selected schools were able to implement learner-centred teaching. The interaction with the participants was the actual process of constructing meaning and the context was the environment in which the investigation was conducted. The targeted context was that of rural and underdeveloped schools.

3.4 POPULATION AND SAMPLING

3.4.1 Population

McMillan and Schumacher (2006:119) define a population "*as a group of elements or cases, whether individuals, objects, or events, that conform to specific criteria, and to which we intend to generalise the results of the research*". Since this study's main purpose was to explore the extent to which rural teachers in underdeveloped schools were capable of implementing learner-centred approach, such schools, teachers and learners were the actual population from which participants were drawn.

For this reason, the participants in this study were drawn from the population which bears similar educational challenges defined by their local and environmental background. The schools were selected from the same environment, the same circuit. Common among the schools also is that all are from a rural and underdeveloped community.

3.4.2 Sampling

Bless and Achola (1988:60) define a sample as "*the sub-set of the whole population which is actually investigated by a researcher and whose characteristics will be generalized to the entire population"*. The sample of this study then was selected such that it became representative of the population not only of the teachers in terms

of their subject specialization, but also of the environment in which they were operating. Hence, the focus is based on rural and disadvantaged schools.

Chiyongo (2010:97) maintains that *"the most important thing in sampling is to identify an appropriate sample from which to acquire data"*. For this study, the researcher used purposive sampling strategies in order to fully understand the extent to which rural school educators (specifically the Physical Science educators) have managed to adopt learner-centred teaching as part of curriculum delivery. McMillan and Schumacher (2010:489) define purposeful sampling as "*a type of sampling that allows choosing small groups or individuals who are likely to be knowledgeable and informative about the phenomenon of interest;""*. It is for this reason that all the participants were involved in the teaching and learning of Physical Science.

In this study, schools and participants were selected on the basis of their ability to contribute to the development of the theory. The setting of this study was the secondary schools in a rural and underdeveloped area (Dannhauser Circuit). In line with a theory/concept of sampling strategy, the participants in the study were the Physical Science educators, Grade 10 to 12 learners who were doing Physical Science as well as HoDs. The reason for choosing Physical Science is that it is perceived to be one of the most resource-reliant subjects. When Abrahams and Millar (2008:1945) posit that *"In many countries, one of the features of science education that sets it apart from most other school subjects is that it involves practical work - activities in which the students manipulate and observe real objects and materials*", it becomes apparent that teaching and learning rely on those resources which students should manipulate and observe. This means that Physical Science is best taught through self-discovery. Learners should conduct experiments themselves to better understand the scientific processes. Hence, Jenkins (1989) articulated that laboratory teaching, as a method of Physical Science teaching, specifically chemistry teaching – reflects the importance of practical work that should be conducted by learners themselves.

The researcher used purposive sampling so as to access in-depth knowledge on the specific, unique issue of learner-centred teaching and learning of Physical Science from subject teacher specialists who happened to be knowledgeable people by virtue

of their professional role and experience (Cohen, Manion and Morrison 2011). Teachers selected for focus group discussions were expected to have the following attributes:

- Educated to at least a post matric level;
- At least ten years of experience as Physical Science teachers;
- Willing to participate in focus group discussions;
- Viewed by the school administration as reflective practitioners who are capable of coming up with possible solutions to challenges.

Sampled learners were those who were doing Physical Science from Grade 10 to 12. This sample size ended up as follows:

- 18 Physical Science educators from six high schools; that is, three from each school.
- 18 learners from the selected schools; three from each school, and
- 6 Physical Science HODs' from some of the selected schools.

The purposive sampling technique was appropriate for this study because the selected participants were in the position to discuss issues concerning the challenges of teaching and learning of Physical Science in rural and underdeveloped schools known to be lacking in both material and human resources. This further clarified the reasons behind learners' poor performance in Physical Science, especially in rural schools.

The researcher noted that in purposive sampling rich information rather than the number of participants was important. Therefore, the sample for this study was selected in such a way that the research questions which sought to establish the challenges of both educators and learners in adopting a learner-centred approach are fully interrogated. This is in line with what researchers (De Vos, 2002:13; Du Plooy, 2002:54) advocate when they assert "*that the main reason for doing sampling is to have a fair representativeness of the respondents to use in order to draw a conclusion based on a general consensus".*

3.4.2.1 Incorporation of Physical Science as the case subject to demonstrate learner-centred teaching

The study focused on the evaluation of learner-centred teaching as part of curriculum delivery in selected schools in Dannhauser Circuit. As mentioned (see section 3.4.2.), participants were Physical Science teachers only. The reason for choosing Physical Science as the case subject is the fact that Physical Science requires more practical work that should be done by learners themselves. Unlike other subjects where mere listening and passively sitting in a class can sometimes yield results, in Physical Science learners should actively search for information, inquire, experiment, solve problems and apply their skills. Therefore, an ideal Physical Science class should be characterised by the learner-centred approach and move away from learners sitting passively in class as receivers of information.

The researcher argues that for learners to be actively involved in a lesson, adequate resources should be available. However, from the researcher's informal personal experience in the rural schools where he is teaching, classroom activities are dull and lack the capability to affect learners' confidence in Physical Science. Lack of resources makes it difficult for teachers to make Physical Science practical and appealing to learners. Chemistry teaching for instance reflects the importance of practical work that should be conducted by learners themselves.

All schools in Dannhauser Circuit are no-fee schools. In terms of the Education Laws Amendment Act (No 24 of 2005), no-fee schools are those schools that serve the poorest communities, and have to allow learners to enrol without paying fees. In return, government funds expenses that were previously covered by fees. In addition, all schools in this circuit were granted a section 21 status which empowers them to handle their finances in terms of budgeting, requisition and procurement of school resources. Despite these apparent developments, these schools are not taking these advantages to enhance their quality of teaching and learning. There are notable drawbacks which render them ineffective in terms of enhancing their quality of education. Firstly, most School Governing Body (SGB) members are not well educated. This is because the only criterion for becoming a member of the SGB

is to be a parent or a legal guardian of a learner attached to a particular school. According to Emerging Voices (2005:24), *"there is a problem with the education level of SGB members. If the government were to focus on Adult Basic Education and Training (ABET), we could bring skills to our people".* Workshops to empower SGB members are yet to bring adequate results. Hall and Giese (2009) also note that despite efforts to provide financial management training to SGBs, the financial reporting requirements remain complex and onerous, and proper budgetary management is beyond the capacity of many schools. In addition, the notion of no-fee schools to most rural parents meant that they should never pay any fees towards the education of their children. Therefore, schools rely only on departmental allocations which are calculated by multiplying the learner allocation by the number of learners enrolled at the school. This has put schools with smaller enrolments on the receiving end in terms of sufficient funds to acquire adequate school resources. For such reasons, the researcher maintains that most changes brought about by the government of the day are just politically correct but still irrelevant in terms of uplifting the standard of education in rural and under developed areas.

This is further confirmed by Hall and Giese (2009:38) when they say *"misleading statements by politicians about free education have added to the confusion, and resulted in parents refusing to pay fees".*

3.4.3 HISTORICAL BACKGROUND OF THE SELECTED SCHOOLS

This study was based on rural and underdeveloped schools in Dannhauser Circuit Management Centre. This Circuit Management Centre is under Amajuba District which also falls under the Provincial Department of Basic Education in KwaZulu-Natal Province, South Africa. Data was collected from six high schools falling under Dannhauser Circuit. Distinctive in these schools is not only their geographical location, but their historical background too. Wilkinson (2015:2) posited that "*there are two types of school systems in South Africa, largely split along historical-school-system and socio- economic lines".* Townships, like rural areas in South Africa, are mainly inhabited by blacks whom the apartheid regime excluded from quality education. For this reason, the researcher still believe that, up to this day, rural

education has never been a priority even for this government owing to the remote nature of rural schools. Simply put, the current government has not adequately addressed the issue of poor teaching methods and low quality education in rural areas.

3.4.4 SEEKING PERMISSION TO CONDUCT A STUDY

After the researcher had identified the schools where the study was conducted, a letter requesting permission was sent to the Dannhauser Circuit Manager (Appendix E); thereafter other letters were sent to the six principals of the selected schools (Appendix F). The letters specified the dates on which the researcher would visit each school. Furthermore, permission was requested from all participants, namely; the Physical Science teachers, learners and HoDs (see Appendixes G, H, and J). Verbal permission was obtained from the teachers and arrangements were made with them so as to observe their lessons when teaching.

3.5 DATA COLLECTION

3.5.1 Orientation

According to Kombo and Tromp (2006:99), data collection refers to *"the gathering of information to serve or prove some facts"*. Data collection is vital in everyday living. For example, commercial organisations collect data to improve their economic prospects. By collecting the views of peoples' attitudes about products, they are able to offer goods or services that potential customers seem to want. Four types of data gathering techniques were used to gather data for this study. A brief description of each technique and the number of respondents involved in each case are presented below.

3.5.2 Data collection techniques

For this study, data was collected through interviews, focus group discussions, observations and document analysis. According to Daymon and Holloway (2002, in Ibrahim, 2006:64), "*the combination of interviews, observations and content analysis as qualitative data collecting techniques are likely to yield the most needed*

information about the topic under investigation". Observations and interviews are the most common data collection methods in qualitative studies. They are mainly used to give more detailed insights into interpreting the situation so that the researcher sees things as they really are.

The purpose of the phenomenological approach is to illuminate the specific, to identify phenomena through how they are perceived by the actors in a situation. In the human sphere, this normally translates into gathering 'deep' information and perceptions through inductive, qualitative methods such as interviews, discussions and participant observation, and representing it from the perspective of the research participant(s) (Lester, 2004). The researcher chose these four techniques of collecting data because they were likely to yield a great deal of information about the extent to which learner-centred teaching has been adopted and thus used by Physical Science educators in selected rural schools.

3.5.2.1 Interviews

In order to get the deeper understanding of the participants, one of the four data collecting techniques the researcher used was the interviews. Gill, Stewart, Treasurer and Chadwick (2008:192) posit that:

> *Qualitative methods, such as interviews, are believed to provide a 'deeper' understanding of social phenomena than would be obtained from purely quantitative methods, such as questionnaires.*

In this study, structured, semi-structured and unstructured interviews were used. The selection of interview strategy and forms depended on the context. The semi-structured interviews were asked primarily to explore the participants' views, beliefs, attitudes and experiences about the nature of teaching and learning that is taking place in their schools.

For the interview guide approach, topics are selected in advance. A structured interview is characterised by its structured format in that questions are detailed and developed in advance and are asked in a rather structured manner (Niewenhuis &

Maree, 2008). This type of interview enabled the researcher to target those issues which were purposefully planned to cover. Those were also intended for the information rich participants.

According to White (2005:143), an interview instrument *"provides access to what is inside a person's head, makes it possible to measure what a person knows (knowledge or information), what a person likes or dislikes (values and preferences) and what a person thinks (attitudes and beliefs)".* Unstructured interviews were considered where significant 'depth' was required, or where virtually nothing was known about the subject area or a different perspective of a known subject area was required.

According to Leedy and Ormrod (2005), interviews in a qualitative study are rarely structured as the interviews conducted in a quantitative study. Instead, they are either open-ended or semi-structured, in the latter case revolving around a few central questions. Unstructured interviews are, of course, more flexible and more likely to yield information that the researcher had not planned to ask for. However, their primary disadvantage is that the researcher gets different information from different people and may not be able to make comparisons among the interviewees. In this study, interviews were conducted to elicit the responses from the Physical Science HoDs of all selected schools.

- **Semi-structured interviews**

As mentioned, semi-structured interviews were employed as a data collection technique. In this regard, the researcher was aware of key issues on which he wanted to gain information although the spontaneity of interviewees referring to other matters was not suppressed. It should be noted that in this semi-structured interview the general outline to be followed was indicated but within each section the questioning was free according to the choice of the interviewer (Sidhu, 2003).

- **In-depth semi-structured individual interview**

Muzumara (1998:51) defines an in-depth semi-structured individual interview as "*a two-person conversation initiated by the interviewer, for the specific purpose of obtaining research-relevant information as specified by research objectives of systematic description, or explanation*".

In the study, the in-depth semi-structured interviews were used to interview the HoDs who were in most cases representing the school management. Some of the questions for the HoDs were sensitive in that they probed financial and budgetary issues. The researcher opted to use interviews for the HoDs so as to provide them liberty to divulge sensitive information which would have been difficult for them to share in focus groups.

The views of the HoDs assisted the researcher to also validate responses from teachers and learners. The interviews were held in a private setting with one person at a time so that the subject was free to express himself or herself fully and truthfully.

3.5.2.2 Focus groups

A focus group is a qualitative research technique which is a form of group interview which relies on the interaction within the group to discuss a topic or topics supplied by the researcher, aimed at yielding a collective instead of an individual view (Cohen, et al., 2011). Denscombe (2010) identifies three distinct features of a focus group as follows:

- There is a focus to the session, with discussion based on an experience about which all participants have similar knowledge;
- Particular emphasis is placed on the interaction within the group as a means of eliciting information; and
- The moderator's role is to facilitate the group rather than lead the discussion.

Accordingly, the researcher made use of focus groups where, as a moderator, my role was that of facilitating interaction within the group of teachers who had similar knowledge.

According to Rabiee (2004:1), "*the main aim of focus group interviews is to understand and explain the meanings, beliefs and cultures that influence the feelings, attitudes and behaviours of individuals*. *Participants are selected on the criteria that they would have something to say on the topic, are within the age-range, have similar socio-characteristics and would be comfortable talking to the interviewer and each other*". This is further clarified by Suhonen (2009:xii) who posits that *"a common approach in focus interviews is to invite a group of experts to discuss about the research topic"*. Hence, Physical Sciences educators, HoDs as well as learners who were selected on the grounds that they were best suited to understand and respond to the focus group questions set for this study.

Brotherson (2007) indicated that focus group interviewing assists in understanding both the anticipated and unanticipated consequences of early intervention and interpreting the complexities of systems, disciplines, and agencies. Therefore, focus group interviews were best suited to achieve the aims and objectives of this study since, in order to establish their understanding of the learner-centred approach, it was vital to identify their intentions, needs, the benefits associated with a learner-centred approach, as well as their aspirations towards understanding and mastering of the learner-centred approach. Gill et al. (2008:196) maintain that *"focus groups are also useful in generating a rich understanding of participants' experiences and beliefs*". A focus group is a carefully planned discussion designed to obtain perceptions on a defined area of interests in a permissive, non-threatening environment. Another purpose of selecting Physical Sciences educators from one circuit (Dannhauser) was to warrant a non-threatening environment since they commonly cluster as a departmental requirement.

The researcher chose the use of focus group interaction for this study which is premised on the postcolonial tradition where interaction is emphasized as a way of giving a voice to the previously marginalised so that they can relate their own history and other experiences. By now it is an open secret that rural schools were

disadvantaged and marginalised by the apartheid regime. This became critical to attain not only the educators' skills of implementing a learner-centred methodology but also to uncover their feelings and attitudes regarding the challenges brought by education innovations of post-1994 in South Africa. Thus, focus groups were also used for generating information on collective views, and the meanings that lie behind those views. Hence, the focus group discussions gave rural educators and learners a voice to articulate their attitudes, perceptions, feelings and ideas about the specific topic on the implementation of the new education policy which recommends a shift from a teacher-centred approach to a learner-centred approach.

One important reason behind the researcher's choice of the focus group method was to respond to some apparent frustrations brought by volatile curricular changes in South African education. Notably, also was the limited participation they have around policy formulation. Yet, they have a responsibility to implement policies which they hardly understand despite the limited support they get.

Kreuger (1988) mentioned that focus groups can be used at the preliminary or exploratory stages of a study. As explained above, in this study focus groups preceded individual interviews; the researcher started by inviting all Physical Science educators in each school and asked them to discuss their experiences and challenges in implementing a learner-centred approach.

Thereafter, one HoD from each school was purposefully and individually interviewed on the basis of his or her potential of providing more information on the topic.

- **Advantages of focus group interviews**

Punch (2005:171) points out that well facilitated focus group discussions can "stimulate people in making explicit their views, perception, motives *and reasons".* The Institute of Consumer Studies (2010) also corroborated the following advantages of a focus group research:

i. In a face-to-face interview, a moderator can keep the discussion under control and focus on the areas of interest as described in the moderator discussion guide. For this reason, it becomes possible for the researcher to direct the participants such that they do not digress from the objectives of the study under discussion.

ii. Free and open discussion among the respondents results in generation of new ideas which can be very useful for business decision making. This is a critical requirement in conducting research and in line with the overall aim of conducting a research, which is to generate new ideas.

iii. A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived from a focus group.

vi. Fully equipped modern focus group facilities enables clients' personnel to observe the discussion in order to better understand the research findings and also to quality control the whole process.

v. Expressions other than those in verbal form such as gestures and stimulated activities can provide the researcher with useful insights.

Other advantages are pointed out by Gibbs (1997), who noted among other things that the main purpose of focus group research is to draw upon respondents' attitudes, feelings, beliefs, experiences and reactions in a way in which would not be feasible using other methods, for example observation, one-to-one interviewing, or questionnaire surveys. This helped to an extent to verify one of the objectives of this study which was to determine the attitudes of Physical Science educators towards the educational innovations in South Africa. These attitudes, feelings and beliefs may be partially independent of a group or its social setting, but are more likely to be revealed via the social gathering and the interaction which being in a focus group entails. Compared to individual interviews, which aim to obtain individual attitudes, beliefs and feelings, focus groups elicit a multiplicity of views and emotional processes within a group context.

Observational methods tend to depend on waiting for things to happen, whereas the researcher follows an interview guide in a focus group. In this sense focus groups

are not natural but organised events. Focus groups are particularly useful when there are power differences between the participants and decision-makers or professionals, when the everyday use of language and culture of particular groups is of interest, and when one wants to explore the degree of consensus on a given topic.

3.5.2.3 Observations

Data was also collected through intensive observation. Glesne (1999:44-45) asserts that *"researchers must decide for themselves how involved they will become in the setting, that is, whether their observation technique will be largely 'observer' or largely 'participant'*. In this study, the researcher decided to be a participant observer. Since in most cases observations took place during teaching sessions, or when learners were supposed to be performing some experiments, the researcher refrained from being a complete participant. The lesson observation process aimed at helping the researcher to see the reality of whether Physical Sciences teachers have fully adopted the learner-centred approach and, if so, to what extent are they able to implement it. The classroom observations focused on the following areas:

- What educators and learners do at the start, during and at the end of a lesson?
- The extent to which appropriate learner-centred methods were applied/implemented by educators.
- Whether learners individually or in a group were free to express their opinions and to interact with each other and their educators.

The researcher sat in the participants' classes during their regular Physical Science time and used an observation sheet (see Appendix C) to record what he saw, heard, and experienced during a teaching session (Gay & Airasian, 2000).

During and after the observations, the researcher took some field notes on what he saw, heard and observed. This enabled the researcher to reflect on his own limitations on implementing learner-centred teaching strategies.

Observation in the research setting was nevertheless planned intentionally to record the behaviour as it happened. The most important part of conducting class visits was to observe the extent, if any, to which educators in the selected schools apply learner-centred strategies.

This method provided the researcher with an opportunity to collect such data which might have not been possible to retrieve via the interviews, focus groups or the viewing of documents. This method helped the researcher to develop a holistic understanding of the phenomena. Furthermore, it increased the validity of the study and helped the researcher to have a better understanding of the context and phenomenon under study. Through observations the researcher managed to further use his five senses to unlock the limitations of implementing curriculum innovations in rural schools.

In the process of observation, the researcher used a structured form of observation, whereby he focused on the same features in all the classes and the lessons he observed. For this technique an observation tool was designed to record what he saw and heard (see Appendix C). Basically, in this study the observation method of data collection was used practically to assess the extent of implementation of learner-centred approaches in Physical Sciences classrooms. Those were informed by:

- What educators do at the start, during and at the end of a lesson;
- The extent to which appropriate active learning methods are applied/implemented by educators or not; and
- Whether learners individually or in a group are free to express their opinions and to interact with each other and their teachers.

The researcher sat in the participants' class during their regular Physical Science periods and used an observation tool to record what he saw, heard, and experienced

during a teaching session. A minimum of three lessons were observed from each participant of each school.

An attempt was made to observe educators on different days of the week to avoid observing activities that might have been repeated on the same day each week. All observations recorded were primarily descriptive in nature and were captured as field notes and used to identify any emerging patterns when compared with information from the interview sessions and document analysis.

Patton (1990:88) articulates that *"observations can be overt or covert; in covert observation the observer is not known by the people he/she observes and he/she does it in secrecy while in overt observation, the observer is known by the people he/she observes".* In this study, the researcher used participant/overt observation where he basically observed lessons in progress. As a participant observer, the researcher was able to stay as much as possible with the participants and was able to watch what they were doing, listening to what they say. In this study, the researcher also interjected himself into an actual situation in an effort to draw out and document the participants' reactions. This enabled the researcher to describe the setting that was observed; the activities of the participants that took place in that setting.

In doing so, the researcher was further guided by the research question as well as his observation tool so that the observation was not just haphazard but theoretically selective. This enabled him to become part of the group and interact with them; it created an atmosphere in which he interacted freely with participants in their class activities thereby developing mutual trust.

Leedy and Ormrod (2005) noted that unlike observations conducted in quantitative studies, observations in a qualitative study are intentionally unstructured and free-flowing. This enabled the researcher to shift focus from one thing to another as new and potentially significant objects and events present themselves. The main advantage of carrying out an observation in this was that the researcher managed to take advantage of unforeseen data sources as they surfaced. Apart from observing

the learner-centred methods applied in the classes, the researcher was able to further observe:

- The physical condition of the classroom/laboratory;
- Resources available and used for the lesson, including the laboratory facilities; and
- The role of learners during the lesson.

So as to offset the disadvantages cited by Leedy and Ormrod (2005), the researcher's observation tool as well as the intent to respond to the research question helped to prevent deviating from the ultimate purpose of the study.
Although the researcher was mostly guided by the observation tool for a specific data required for analysis, a minimum of three lessons from each participant were observed.

3.5.2.4 Documents analysis

Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic. The Student Voice website (2010) maintains that documents can help reconstruct events, and give information about social relationships. Given the setting of the study, where South Africa is a classic example of an unequal society, the selection of a rural community is intended to reveal inequality in terms of teaching approaches.

Chiyongo (2010:113) notes that "*it is important to analyse the contents of the documents so as to verify the information obtained using other methods of data collection".* Hence, the researcher's intention is to view and analyse all relevant documents that can reveal the quality of teaching strategies so as to evaluate their consistency with the curriculum innovations.

For this study, the documents used included information from the following:

- Log books: These furnished the comments written by Physical Science subject advisors who visit the school;
- Educators and learners' portfolios: These showed learners' performance in Physical Science; and
- Teachers' lesson preparations: These demonstrated how Physical Science educators plan their lessons and which resources they use to prompt learner-centred teaching.

These documents provided information on how the schools implement their instructional programmes, the challenges and teaching methods the participants used in their teaching. The records from learners and educators' portfolios provided information on the performance of learners and the comments from the subject advisors. These hinted at the effectiveness or the challenges of implementing a resource-dependent curriculum in schools where there is a shortage of resources which are critical for learner-centred teaching.

3.6 DATA ANALYSIS

Groenewald (2004) warns that data analysis is deliberately avoided in phenomenology because Hycner (1999) discerns that analysis has dangerous connotations for phenomenology. According to Hycner (1999), the term analysis usually involves a breaking into parts and therefore often means a loss of the whole phenomenon, whereas explicitation implies an investigation of the constituents of a phenomenon while keeping the context of the whole. Coffey and Atkinson (1996:9) regard analysis as the *"systematic procedures to identify essential features and relationships. It is a way of transforming the data through interpretation".*

For Cohen, et al. (2011:537), data analysis is *"a rigorous process which involves organising, accounting for, and explaining the data; in short, making sense of the data in terms of participants' definitions of the situation, noting patterns, themes, categories and regularities*". Therefore, data analysis involved "*constructing a framework for communicating the essence of what the data reveal"* (de Vos, et al., 2001). In qualitative research, data collection, analysis and recording operate as

interrelated procedures that are on-going, rather than as isolated incidents (Marshall & Rossman, 2006:155).

For this study, the researcher therefore used a simplified version of Hycner's (1999) explicitation process. Hence, in line with phenomenological data analysis, the five phases of the explicitation process were used:

- **Bracketing and phenomenological reduction**

Holloway (1997) and Hycner (1999) recommend that the researcher listens repeatedly to the audio-recording of each interview to become familiar with the words of the interviewee/ informant in order to develop a holistic sense, the 'gestalt'. Zinker (1978) explains that the term 'phenomenological' as implying a process which emphasises the 'here and now' dimensions of those personal experiences which gives phenomena existential immediacy in this study. The researcher carefully considered the responses of the participants and tried to understand them in relation to their individual experiences. This refers to how learner participants experience and understand their role in a learner-centred environment, which challenges are experienced by educator participants in implementing learner-centred teaching and which supportive role the subject specialists play in helping Physical Science educators to implement learner-centred teaching.

- **Delineating units of meaning**

This is a critical phase of explicating the data in that those statements that are seen to illuminate the researched phenomenon are extracted or 'isolated' (Creswell, 1998; Holloway, 1997; Hycner, 1999). This is where a substantial amount of judgment calls will be made while consciously bracketing my own presuppositions in order to avoid inappropriate subjective judgments.

In this step, the list of units of relevant meaning were therefore extracted from each interview and carefully scrutinised while eliminating redundant units. This was done

by considering the literal content, the number of times (the significance) a meaning was mentioned and also how non-verbal or paralinguistic cues were stated.

- **Clustering of units of meaning to form themes**

In this regard, an attempt was made to elicit the essence of meaning of units within the holistic context. Hycner (1999) indicates that this calls for even more judgment and skill on the part of the researcher. This will call for the following:

i. Forming clusters of themes by grouping units of meaning together;
ii. Identifying significant topics or units of significance; and
iii. Determining central themes by interrogating various clusters.

- **Summarising each interview, validating it and where necessary modifying it to give a holistic context**

A summary that incorporated all the themes elicited from the data was made (Ellenberger as cited by Hycner, 1999:153-154). At that point, the researcher conducted a validity check by returning to the informant to determine if the essence of the interview had been correctly 'captured'. Any necessary modifications were then subsequently made.

- **Extracting general and unique themes from all the interviews and making a composite summary**

Once the process outlined in points 1 through 4 was done for all the interviews, the researcher looked for the themes common to most or all of the interviews as well as the individual variations.

It is at that stage that a composite summary was compiled. This reflected the context from which the themes emerged. At that point, participants' expressions were transformed into expressions appropriate to the discourse supporting the topic.

3.7 RELIABILITY, VALIDITY AND TRUSTWORTHINESS OF THE STUDY

This section of the study deals with validity, reliability and trustworthiness of the study. The researcher has decided to discuss them in order to determine whether the study adhered to these three criteria of scientific study.

Creswell (1994) asserts that quality criteria such as trustworthiness and authenticity should be established in qualitative research. Lincoln and Guba (1989:290) contend that "*trustworthiness of qualitative research identifies four primary components that are relevant to such an inquiry: truth value, applicability, consistency and neutrality".* Holton and Burnett (1997) argue that the techniques that are used to measure reliability and validity are valid if they measure what they are supposed to.

3.7.1 Validity

According to Schumacher and McMillan (2006), validity refers to the degree of congruence between the explanations of the phenomena and the realities of the world. Validity of qualitative design, therefore, refers to the degree to which the interpretations have mutual meanings for the participants and the researcher. These people should agree on the description and interpretation of the events being discussed.

Cohen and Manion (1994) regard the most important quality of any research instrument as its validity or extent to which an instrument measures what it is supposed to measure. In a qualitative study, the researcher is also an instrument of data collection. Therefore, the definition of validity cited above is applicable to this study.

In this study, the researcher used four appropriate methods to ensure triangulation which adds to the validity of scientific research (White, 2003). Since the study was mainly descriptive, the researcher employed focus group discussions, semi-structured interviews, observations and document analysis. The methods of collecting data were determined by the following factors: the nature of the data that

was collected, the research questions that were asked, scope of the participants selected and the ways of maximizing the validity, and the reliability of the data.

Regarding validity of observation, Sidhu (2003:165) advised that *"the observer must be qualified to make judgments regarding the activity observed and emphasizes that actual observation should be made of on-the-job- activity as well as the product of such activity"*. In terms of this study, the researcher went to all selected schools to gather data during observation.

3.7.1.1 Content validity

According to Bless and Achola (1988:107), "c*ontent validity is concerned with whether or not a measuring instrument is representative of the full content of the thing being measured"*. The content validity of this study heavily relied on the techniques that were used, the research skills displayed, and the suitability of the objects that were examined and their conformity to the framework of the study. According to Ibrahim (2006:68), "*these validity standards can be implemented by reviewing all relevant literature for any precedent use of analogous technique, by seeking the assistance of specialist definitions by expert figures in the field and by conducting sufficient number of semi-structured in-depth interviews"*.

3.7.1.2 Face validity

Face validity is considered to be a complementary technique which ensures that a research measures what it supposed to measure. Prior to collection of data, a list of questions relating to the study, which were meant to guide the researcher during the interviews, were submitted to the supervisor and peers in order to assess the validity of the questions.

The concept of face validity is described by a wide range of terms in qualitative studies. This concept is not a single, fixed or universal concept, but rather a contingent construct, inescapably grounded in the processes and intentions of particular research methodologies and projects.

(Winter 2000:1) argued that "*although some qualitative researchers have argued that the term face validity is not applicable to qualitative research, they have at the same time realized the need for some kind of qualifying check or measure for their research"*. Golafshani (2003) suggests that face validity is affected by the researcher's perception of validity. As a result, many researchers have developed their own concepts of face validity and have often generated or adopted what they consider to be more appropriate terms, such as, 'quality', 'rigour' and 'trustworthiness'.

3.7.2 Reliability

Qualitative researchers regard reliability as the elimination of casual errors that can influence results. Reliability can be divided into internal reliability and external reliability. In research studies, internal reliability is achieved during the study through triangulation, cross examination, member checks, careful selection and training of assistant researchers, careful auditing of the data by reaching consensus regarding the findings with the participants, and using audiotapes and video-recordings to store information and computers for the processing of data. Conversely, external reliability refers to the verification of the findings of the research, when the same research is conducted by an independent researcher under the same circumstances and using the same participants (White, 2005). According to Muzumara (1998:49), reliability refers to the "*consistency between independent measurements of the same phenomenon. The same methods used by different researchers at different times under similar conditions should yield same results"*. To increase external reliability, the researcher accurately described the various aspects of the subjects such as status and their roles, the concepts and the methods used. Although reliability and validity of the study are treated separately in quantitative studies, these terms are not viewed separately in qualitative research (Golafshani, 2003). Instead, a terminology which encompasses both, such as credibility, transferability, and trustworthiness, are often used (White, 2005) and that was the focus of the researcher.

From the definitions above, reliability and validity in qualitative research reveal two strands: firstly, with regards to reliability, whether the result of the research can be

replicable or not; secondly, with regards to validity, whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure. Although this researcher holds the view that replicability is difficult to ensure in qualitative studies, he nevertheless strived for replicability by ensuring that the methods of gathering data were accurate and efficient. The researcher also made sure that the research design was appropriate to the problem that was investigated. In this way, other researchers who would like to replicate this study would be likely to obtain similar results in similar conditions.

3.7.3 Trustworthiness of the study

According to White (2005:203), "*trustworthiness refers to the quality of the research."* Accordingly, this study is considered trustworthy because the findings were based on a well-founded research design as well as relevant informants and context. In this regard, with the consent of the participants, the researcher tape-recorded the interviews and regular field notes and photographs, which were available for scrutiny, were taken. To ensure trustworthiness, the researcher considered Lincoln and Guba's method (1985), which consists of the following criteria for establishing trustworthiness, namely; truth-value, applicability, consistency and neutrality.

3.7.3.1 Truth-value

In research studies, truth-value helps researchers to establish confidence in the subject and the context in which the research is undertaken. In this study, the researcher established confidence through the strategy of credibility. Credibility was achieved through prolonged fieldwork, triangulation, persistent observation, taking notes during the Interviews and recording the interviews, peer debriefing, and focusing on the topic under study.

3.7.3.2 Applicability

According to White (2005), applicability refers to the degree to which the findings can be applied to other contexts and settings or with other groups. It is the ability to

generalise the findings to larger populations. However, in qualitative research, generalization is not important because data will not always be the same in similar settings and, even if the study could be repeated using the same participants, the findings might not be exactly the same as in the previous one. According to Babbie and Mouton (2004), these beliefs, thoughts and perceptions might not be the same in another situation. Applicability then was not seen as relevant to this qualitative study, because the purpose of the study was to describe a particular phenomenon or experience, and not to extend or apply results to other situations (White, 2005:204). However, according to White (2005:4), *transferability is a criterion against which applicability of qualitative data is assessed".* This study would meet this criterion when the results fit into contexts outside the study situation that are determined by the degree of similarity or suitability.

3.7.3.3 Consistency and neutrality

Consistency means that the findings of the research would be consistent if the inquiry were replicated with the same participants or in a similar context (White, 2005). The instruments that are assessed for consistency in a qualitative study are the researcher and the participants. Therefore, a qualitative study emphasises the uniqueness of the human situation so that variation in experience rather than identical repetition is sought.

Dependability is used to ensure consistency (Marshall & Rossman, 1995). According to Babbie and Mouton (2004), dependability indicates that if research were to be repeated with the same participants in the same context, the findings would be similar, not necessarily identical. In order to attempt to ensure dependability, the researcher permitted independent experts who were experienced in qualitative research methodology and peers to scrutinize the data and the techniques of obtaining them. The supporting documents were also availed to them for further scrutiny.

3.8 THE PILOT STUDY

Pilot studies refer to mini- versions of a full-scale study (also called feasibility studies), as well as the specific pre-testing of a particular research instrument such as a questionnaire or interview schedule (Van Teijlingen & Hundley, 2001).

De Vaus (1993) considered that one of the advantages of conducting a pilot study is that it might give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated.

In this study, the researcher intended to test the adequacy of the data collection instruments. Initially, data collection involved the use of questionnaires. However, this method proved to be disadvantageous, given the delayed and low rate of responses from the participants. This was confirmed by Milne (1999) when he cited following three disadvantages of using questionnaires:

- Some people may not be willing to answer the questions. They might not wish to reveal the information or they might think that they will not benefit from responding perhaps even be penalized by giving their real opinion.
- Questionnaires also invite people to lie and answer the questions very vaguely which they would not do in an interview.
- If you forget to ask a question, you cannot usually go back to respondents, especially if they are anonymous.

In the first version, the participants were educators irrespective of subjects they were teaching. This had to be discarded in favour of using just one of the most resource-reliant subjects. This was necessary given the practical nature of Physical Science and its reliance on resources which, in turn, requires active participation of learners when, for instance, conducting experiments. The obvious implication is that the teaching and learning of Physical Science should basically be in the form of inquiry. Moreover, it should be characterised by the learner-centred approach and move away from learners sitting passively in class as receivers of information, to searching for information, inquiring, experimenting, solving problems and applying their skills.

Finally, the pilot study helped to refine my approach of establishing a rapport with the actual participants in terms of alleviating fears and perceptions of the participants who at first could not understand whether the researcher was meddling in their teaching strategies or if it was a form of assessment. This could have been unethical and thoughtless given the poor results in Physical Science in all the selected schools.

3.9 CONCLUSION

This chapter accentuated a number of procedures which the researcher followed in conducting the main study. An elucidation was given concerning the participants in the research, the methods of data collection and how data was collected. The data collection methods consisted of focus groups, interviews, observations and the collection and analysis of relevant documents.

Finally, it highlighted the pilot study conducted, the sample of the pilot study and the resultant improvements which became part of the main study. When analysing the aspects contained in the functionality assessment tool above, the resources that were being sought in terms of their availability were textbooks, stationery and workbooks. The researcher, without understating the value of the mentioned resources, argues that such resources do not convince that their availability can ensure that a school has the ability to implement a learner-centred approach.

CHAPTER 4
DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter provides an analysis and an interpretation of the qualitative data collected by means of the research techniques discussed in chapter three. The following data collection techniques were used:

- Focus group interviews: These were used to collect data from Physical Science teachers and Grade 10 to 12 learner participants who were doing Physical Science.
- Interviews: These were conducted to unearth the views of the Physical Science subject heads and, where possible, the heads of departments from all schools under investigation.
- Observations: The researcher further observed teaching and learning in classroom situations to witness whether or not learner-centred teaching was correctly implemented.
- Document analysis: Relevant documents were also analysed to verify the findings obtained through the use of the other three techniques stated above.

The researcher in this study adopted a qualitative approach. Qualitative research is a multi-method in focus in that it embraces a perspective that combines an interpretive and a naturalistic approach to its subject matter. In a qualitative study, the voice of the individual is of cardinal importance (Denhart, 2008). The qualitative design was the main approach used in this study because, as opposed to the quantitative research, the qualitative researcher uses multiple voices to bring across the main message. Through these numerous voices, the researcher strived to convey naturalistic, complex, varied and expansive meanings and even accommodated the silence between the multiple voices (Thody, 2006). In this study, the qualitative design aimed at exactly doing that: collecting, presenting and analysing multiple data through multiple voices of teachers, HoDs and learners at

Dannhauser Circuit secondary schools in KwaZulu-Natal Province, South Africa. The researcher approached the teaching of Physical Science from the point of view of teachers, HoDs and learners and therefore needed a methodological approach in which the participants' voices could be heard. Therefore, the qualitative design was chosen to fulfil this particular need.

Firstly, data was collected using focus group interviews. For teacher participants, a total of 18 teachers divided into three groups of six were interviewed. On the part of learners' focus groups also, there were three separate groups each made up of six learners. The other three data collection techniques, namely; individual interviews, observations and document analysis were basically used to authenticate the findings collected during the focus group phases.

As the study was aimed at evaluating the extent to which educators in rural schools have managed to apply the learner-centred approach, phenomenological design became appropriate to describe the experiences of the participants from their own perspectives. Robson (2002:450) asserts that "*as ever, your research questions drive the form of analysis which you choose".* In this study, the research question that was to drive the phenomenological analysis of its findings was as follows:

- How do educators in rural and under developed schools cope with learner-centred teaching as part of curriculum innovation?

The sub-questions which were considered important to further clarify the nature of an instructional programme taking place in the selected schools were as follows:

- How does the lack of resources affect the implementation of a learner-centred approach?
- How does the rural and underdeveloped condition affect the implementation of curriculum innovations?
- How do educators' prior knowledge and their experiences impede their- participation in new curriculum developments?

In analysing the findings of this study, the explicitation process was followed (see section 3.6). By clustering all emerging and similar topics together in order to form themes, the researcher arrived at the following themes:

- The impact of teachers' prior practices;
- Quality of Physical Science lessons;
- Challenges unique to rural environment;
- Poor teacher development support;
- The shortcomings of rationalization and redeployment; and
- Learner-centred teaching as an antecedent to quantity education.

4.2 DATA PRESENTATION AND ANALYSIS

As mentioned in section 4.1, the findings of the study were organised into themes which gave expression to the discourse supporting the topic. The following is the presentation and analysis of the themes that were elicited from the data collected:

Table 4.1: A comprehensive table of the themes derived from a combination of all data collecting techniques.

THEME	THEME NAME	SUB TOPICS
Theme 1	The impact of teachers' prior practices	Determination of teachers' convictions The impact of teachers' epistemologies Consideration of learners' interests

Theme 2	The quality of Physical Science lessons	□ Classroom observations □ Learners' dependency Lack of resources as a deterrent to self-discovery learning Learners' and teachers' perceptions about Physical Science
		□ English language as a barrier to learning □ Learners' low confidence in Physical Science
Theme 3	The impact of the rural environment	□ Recruitment and retaining of qualified teachers □ Non-existence of rural incentives
Theme 4	Poor teacher development support	□ Evaluating teacher-development programmes □ Inappropriate teacher-development programmes □ Inept support from the departmental officials
Theme 5	Rationalization and redeployment	Heavy workloads
Theme 6	Learner-centred teaching as an antecedent to quantity education.	

Table 4.1.1: Description of participants' codes

Code	Description
T	Teacher participant
L	Learner participant
HOD	Head of Department

NB. The above table explicates the codes identifying the participants in this study. As explained, a total of 18 teachers participated in the focus groups. Hence, letters T1 up to T18 represent all teacher participants. Similarly, letter L1 to L18 represent 18 learner participants. HOD's 1to 6, are also identified by code HOD.

Theme 1

4.2.1 The impact of teachers' prior practices

As stated in section 2.4.4, teachers' prior beliefs and practices can pose some challenges. These are not only because teachers are unwilling to adapt to new policies, but also because their existing subjective knowledge may interfere with their ability to interpret and implement a reform in ways consistent with policymakers' intent. In addition, this study had to prove the existence of other challenges that can restrict teachers to adopt new innovations. Hence, the roles of resources, environmental challenges and policy overload will be discussed.

4.2.1.1 Determination of teachers' convictions

One of the focus group questions asked to the participating Physical Science teachers in order to determine their understanding of a learner-centred teaching was:

Do you think a learner-centred approach can help to improve the quality of teaching Physical Science, why and how?

Educators were convinced that a learner-centred approach could help to improve the understanding of Physical Science by their learners. However, their

understanding of a learner-centred approach was mostly restricted to self-discovery learning. T1 responded by saying “If *our learners can be able to get information on their own their performance can improve*”.

This response failed to embrace the term student-centred learning as a wide variety of educational programmes, learning experiences, instructional approaches, and academic-support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students and groups of students. Their final comments pointed to the fact that when learners are able to find information on their own, their understanding can be better. However, they understood that rote-learning could be minimal, as T2 pointed out that “learners *wrongly believe that it is enough for them to memorize what we say to them in classrooms”.* It became clear that the current learning of Physical Science by their learners was mainly through memorizing. Nevertheless, educators were aware that traditional method referred to as teacher-centred approach is not appropriate for teaching Physical Science. This is despite the fact that their circumstances denied them capacity to fully implement the learner-centred approach.

Educators were also convinced of the advantage that their work can be easier since learners could be actively involved in their learning. Furthermore, they understood the reliance of learner-centred teaching on resources. They mentioned the challenge of being unable to provide opportunities to their learners for conducting experiments and learning by doing. Hence, T3 said “*our school does not have relevant resources thus it is impossible to use learner-centred methods”* . This was besides their approval and confidence that experiments are critical for better understanding of Physical Science.

4.2.1.2 The impact of teachers’ epistemologies

To determine the extent to which the teachers have adopted the implementation of the learner-centred approach the following question was asked:
Between a teacher-centred approach and a learner-centred approach, which one do you feel more convenient to use, and why?

On this question, it became apparent that educators were still trapped in the teacher-centred approach. That is despite the fact that they understood the need and the related benefits of using a learner-centred approach. Teacher 4 said "our *learners are not capable to work on their own".* Teachers were adamant that their learners were not ready to respond positively to learner-centred standards. They referred to limitations such as insufficient resources to fully adopt learner-centred teaching. This statement by the teachers was justified when the researcher realised that in all selected schools, none has a fully functional laboratory, a fully functioning media centre or access to internet in their schools.

The other challenge which they considered as a hindrance in their attempts to implement learner-centred teaching is the attitude of their learners. They argued that learners are spoon-fed from lower grades; consequently, they are not capable of working independently, and by the time they come to the higher grades they can hardly respond to active learning. Given a long and demanding Physical Science syllabus, they do not find enough time to change learners' working habits. The other pertinent point they raised was that using a learner-centred approach is time consuming. T5 alleged: *"Physical science syllabus is too long and there is a lot of paper work; trying a learner-centred teaching cannot help us to finish the syllabus".* Their thinking was that they cannot complete their syllabi due to the slow response and pace of learners.

For Physical Science, CAPS also makes provision for more practical work by allowing more time for practical work in the subject time allocation. This makes Physical Science to have more teaching hours compared to other subjects. In addition, there is always pressure on them to ensure that learners pass. The teachers also considered external and departmental interventions such as the cluster moderations and common discussion of memorandum by all subject teachers in a circuit as time consuming but not always helpful in improving learner performance.

Although educators are certain about the benefits and the need to comply with the educational innovations; they find it difficult to discard teacher-centred methods in which they themselves were taught. This is echoed by Sunzuma et al. (2012:146)

when positing that "*teaching strategies continue to centre on lecturing and part of this problem has to do with teachers' lack of knowledge and skills to change their way of teaching, and that teachers are greatly affected by their prior experiences as students".*

In the context of educators in the selected schools, there are numerous issues that promote their hesitation. These include lack of training in the implementation of learner-centred teaching; lack of appropriate resource materials as well as ill-conceived departmental interventions and demands aimed at having learners passed no matter what.

4.2.1.3 Consideration of learners' needs

As indicated in section 2.2, Al-Mekhlafi and Perur (2012: 9) strongly argue that "*learner-centredness is reflected by recognizing learners' prior knowledge; their needs, goals and wishes; learning styles and preferences; and their views of teaching and learning and the nature of classroom activities".*

To elicit teachers' beliefs to accommodate learners' views in their own learning, teachers were asked to respond to the following question:

To which extent do teachers consider their learners' interests?

However, this question revealed the teachers' disregard of the role of learners in their learning process as follows.

- Firstly, they found it worthless for learners to suggest how they want to be taught. This meant they do not consider it important to vary their teaching styles to accommodate all learners. Hence, they do not consider learners' needs.
- Secondly, they acknowledged the necessity of building on learners' previous knowledge; however, they have to work according to their respective annual teaching plans. Therefore, there is no time or space for

integrating learners' previous knowledge of the subject with what they have to teach in that given year.

- Thirdly, the nature of classroom activities is determined by the grade syllabus. Therefore, the possibility of doing those activities relies on the availability of resources, particularly those activities that require physical equipment. Also, learners are not given options on the types of classroom activities to be performed. This practice contradicts one important cornerstone of a learner-centred approach which requires that key decisions should be made with reference to the learners' needs and preferences. However, the teachers admitted that given the big numbers in their classrooms, it is difficult to establish or to determine each and every learner's needs, wishes and goals.

This question revealed a wide distance between the educators and their capacity to implement learner-centred teaching. It further revealed an uncaring attitude by the educators which is further informed by their poor understanding of what learner-centred teaching entails.

Theme 2

4.2.2 Quality of Physical Science lessons

One of the data collection methods used in this study was to observe classroom teaching by Physical Science teachers (see section 3.5.2.3).

4.2.2.1 Classroom observations

Classroom observations focused mainly on the following areas:

- What educators and learners do at the start, during and at the end of a lesson;
- The extent to which appropriate Learner-centred methods were implemented by educators; and

- Whether learners individually or in a group were free to express their opinions and to interact with each other and their educators.

The researcher designed a tool through which the intended information could be recorded (see Appendix C). Over and above the specified information, the observation tool was stretched such that whatever relevant activities that speak to methodology of teaching used during the lessons could be included. Among other things the focus was on the following:

Venue compliance: i.e. whether the lesson was conducted in a school environment with sufficient apparatus or in an ordinary classroom without appropriate apparatus.

Teachers' role: that was to determine whether Physical Science teachers apply the learner-centred methods or teacher-centred methods.

Learners' roles during and after the lesson: the intention was to determine the level of engagement by learners during the lesson.

Learner activities: these were assessed by the researcher to determine whether they complied with self-discovery learning as expected in a learner-centred environment.

Learner-centred approaches applied: this was to verify whether learner-centred teaching was applied; the researcher further observed whether each or some of the following learner-centred modes of learning were applied:

- Collaborative learning;
- Problem based enquiry learning;
- Experimental learning;
- Participative learning; and
- Cooperative learning

In all lessons observed, none was conducted in a fully functional laboratory. Out of eight lessons that were observed from six different schools, only two were conducted

in a laboratory-like classroom. However, in both instances there was virtually no relevant science apparatus.

One Grade 11 lesson observed was on Boyle's law**.** The lesson was conducted in an ordinary classroom. When introducing the lesson, the teacher merely explained the procedure while the learners were just listening without playing any role. During the presentation of the matter, the teacher further explained to the learners how to formulate the hypothesis. Furthermore, he explained the equations for ideal gas law, on the board and he then wrote the equation (Pv= n Rt).

Instead of conducting the experiment, the teacher theoretically told them about the apparatus that was required to conduct the experiment, namely; pressure gauge, syringe and the silicon tubing. He further explained the method of conducting the experiment which entails:

- To follow the instructions;
- Recording of readings;
- Calculating values; and
- Plotting graphs.

At the end of the lesson the learners were asked to answer the questions that were related to pressure and volume. When evaluating the lesson, the researcher reached the following conclusions:
Learners did not play any decisive role and neither were they requested to do anything. The lesson was entirely centred on the teacher. No decisive skills were learnt during the lesson. However, if the teacher brought the apparatus and guided the learners on the conducting of the experiment, learners would have been, among other things, afforded the opportunity to learn the following skills:

- To manipulate the apparatus;
- To observe and interpret the process;
- To process the experiment and analyse the findings; and
- To design the experiment.

One critical observation from this lesson was the extent to which the lack of resources can hold back the possibility of implementing learner-centred teaching.

No forms of independent and conclusive learner-centred modes of learning like collaboration, cooperative learning, experimentation or even participative learning were afforded to learners. Therefore, the blame could not be apportioned to the lack of resources only but the teacher in that lesson did not seem to have the appropriate skills nor the intent to engage learners even where resource materials were not much required.

A glaring weakness in the above lesson was the fact that no attempt was made by the teacher to involve learners. In the introduction of the lesson, the teacher called upon learners to explain momentum in their own words or understanding. After attempts by learners, they were called upon to use their textbook to try and find the meaning of 'Momentum and Impulse'. Thereafter, the teacher consolidated the definitions of momentum and impulse. This exercise at least allowed learners an opportunity to get information on their own. During the development of the lesson, the teacher further explained the content using examples and made a few calculations on momentum with some diagrams. Learners were also referred to textbooks to identify examples. Thereafter, they were given a short class work and asked to make corrections by themselves while the teacher was guiding them. The independent activities that were given at the end of the lesson, for example, the worksheets and the questions from previous question papers which they were implored to do as groups, ensured that at least participatory and cooperative learning were applied. Based on this, it was observed that learners were afforded an opportunity to be involved in self-discovery learning, working as team members, collaborative as well as problem-enquiry learning.

Similarly, a Grade 11 teacher in the same school showed a fair measure of commitment when she was teaching 'Quantitative aspects of chemical change'. Despite the absence of apparatus and chemicals to conduct experiments, at least she made use of the data sheet and the periodical table to explain stoichiometric calculations. Thereafter, learners were asked to calculate volume and the number of

moles and mass. Also, learners were divided into groups and given worksheets to conduct a practical investigation.

Another notable observation from this lesson was the size of the class. Like many other lessons observed, teaching took place in an ordinary classroom. The number of learners in the class was 68. Also, a shortage of desks was observed. In some cases there were three learners seated in one desk which was made to seat two learners. Learners were squeezed such that there was limited space for their books on the desks, let alone to write. Since the classroom was overcrowded, it was obvious that the teacher could not give individual attention to the learners and this made it difficult to use a learner-centred approach. However, the teacher tried to engage learners by giving them activities to complete on their own. This helped learners to work collaboratively to find answers as required in learner-centred pedagogy. Furthermore, the teacher tried to show a fair determination to engage learners and help them to do activities that not only sustain their attention but also help them to get information on their own.

In some cases, a combination of teachers' disengagement, lack of resources, teachers' prior knowledge and inadequate teacher development were observed. One such lesson observed was a Grade 10 lesson on 'Interference patterns in a ripple tank'. Out of a total of 58 learners, only 10 had textbooks. For almost 50 of a 60 minutes period, the teacher was writing notes on the chalkboard and used the remaining 10 minutes to explain those notes mainly in mother tongue (codeswitching). Such notes were taken directly from the textbook.

The researcher considered this lesson as an archetype of how badly Physical Science can be taught in underdeveloped schools whereby the learner-centred approach is totally neglected. According to the researcher, by inferring from the chalkboard notes, the apparatus needed to conduct an investigation were: a ripple tank, water, electric vibrator, ripple bar and a 12v battery. However, despite the fact that such apparatus for conducting the experiment was not available, at least the teacher could have given learners the instructions of how to conduct an experiment or could have given them the possible results. However, the notes given were inconclusive and lacked substance. From that lesson, learners did nothing except

copy notes. By the time the teacher tried to explain the chalkboard summary for them, they became noisy and she kept telling them to listen. At the end of the lesson, neither activity nor homework in the form of any task was given to the learners. This lesson was a true reflection of a teacher who was disengaged from work and equally a teacher who totally disregarded the inculcation of a learner-centred approach, which is a hallmark of teaching subjects such as Physical Science.

According to Bakker and Demerouti (2008), work engagement is a state that demonstrates vigour, dedication and absorption in the job. What became obvious was that the teacher did not prepare the lesson and she lacked not only the methods of teaching Physical Science (like learner-centredness), but even the content knowledge of the subject. Qhibi (2006:14) identified the attributes that a Physical Science teacher must satisfy which are as follows:

- Motivation, dedication and communication, so that he/she can motivate and encourage the learners to approach the subject without prejudice of labelling it as a difficult subject;
- Inculcating learner-centred teaching;
- Having a genuine interest in Physical Science;
- Formulating a professional model that promotes reflection upon practice and collaborative dialogue;
- Having full awareness of scientific knowledge and an ability to integrate this knowledge across the curriculum; and
- Being aware of the wide variety of resources, including books, films, laboratory equipment and ICT resources, used on a daily basis within the immediate environment of the learner.

The objectives of that lesson could not be understood since it never surfaced what the teacher wanted the learners to learn from it even in terms of its content. This was a typical lesson referred to by (Qhibi 2006:2), when positing that:

> *Many Physical Science educators expect learners to be enthusiastic about Physical Science, and would like them to have*

the ability to solve scientific problems. Whilst this is a worthy expectation, there is an inconsistency between the educators' expectations and the real classroom situation. From personal experience in the rural schools where I teach, classroom activities are dull and lack the capability to affect the learners' confidence in Physical Science.

After observing these lessons, this study revealed that, the rural environment, characterised by lack of resources, under qualified teachers and demotivated teachers and learners, can give rise to a toxic and obsequious scenario proportional to an academic graveyard. The researcher also confirms that such a toxic mixture of challenges has a devastating impact on the teachers' motivation, particularly at Dannhauser Circuit schools.

To further investigate the use of learner-centredness in identified schools, the researcher managed to access and analyse the following documents:

- **Educators and learners' portfolios**

In the educator's portfolios, the focus was to analyse the assessment tools used to assess learner performances during the year. These included question papers, memoranda and the rubrics for various assessment tasks. For Grade 10 to 12 prescribed tasks, Physical Science tests are set by the provincial department. Thus, they are common in all provincial schools. The common tests, like the NSC examinations, are of equal standard and are meant to be written by all learners irrespective of the location of their schools. Given the differences between affluent and rural schools in terms of the quality of teachers, availability of resources and class sizes, learners from rural schools are being disadvantaged. This was confirmed by the performance of learners observed during data collection. Learner portfolios containing their tasks, scripts and mark lists showed poor performance by rural school learners.

The perusal of these documents was critical so as to evaluate the impact of using inappropriate teaching methods on the learner performances. Besides the fact that

Physical Science is known to be a challenging subject, the records proved that it is even worse in rural schools. This is due to a combination of various factors such as insufficient resources, inappropriate teaching methods such as teacher-centredness and, in some cases, inexperienced and under qualified teachers. Poor performance by learners as observed from their portfolios proved that it was partly due to inappropriate teaching methods by their teachers as they were still subjected to teacher-centred methods. The observation made from the types of answers in learner scripts was that, in most cases, learners gave similar answers which lacked originality. That suggested that they memorized what their teachers taught them. What promoted learners to learn by memorization was apparently the fact that they had to learn Physical Science without the use of relevant resources that are required for the implementation of learner-centred teaching and self-discovery.

- **Lesson Plans and Preparations**

The purpose of perusing lesson preparations for Physical Science teachers was to establish whether learner-centred requirements were included in their teaching plans. These would have been noted by methods to be used, activities given to learners, other strategies to engage learners in the lessons, resources to be used and who and how were they going to be used and other independent activities through which learners were to get information on their own.

One discovery that became dominant when lesson preparation were analysed is the fact that the majority of educators did not have records of lesson preparations. Those who did were not consistent in doing them. Also, the lesson plans were not sufficiently monitored by the HoDs. Different schools used different formats for lesson plans. While this could not be a major issue, it however brought into question the discretion of the subject advisor in terms of agitating for common approaches such as standardized lesson formats among the Physical Science teachers.

In about three schools (school A, C and E), attempts were made to include detailed routine contents of the lesson plans, for example, the objectives of the lesson, introduction, lesson development, roles of teachers and learners, activities, methods, resources and assessment methods. In others, lesson plans were

haphazard, incomplete and sketchy and did not cater for learner activities that harness the learner-centred approach.

Observations from the lesson plans proved once more that one challenge that all selected schools faced was the lack of teaching materials. The commonly indicated resources were the textbooks, chalkboard and worksheets. While these resources are still relevant, they are, however, not exclusively relevant for Physical Science teaching. This further confirmed that the hurdles towards the implementation of a learner-centred approach were also informed by the unavailability of relevant resources. The other observation that came to light was the rareness of the role of learners during the lessons. Also, activities were given that did not specify the resources and the methods through which those activities should be done. This further proved that the teaching of Physical Science in selected schools was mainly teacher-centred. The methods indicated in the lesson plans were basically teacher-centred. These included lecturing, question-and-answer and the narrative method.

4.2.2.2 Learner dependency

To determine whether the participants were used to working independently the following question was asked:

> *Do you find it helpful to do practical investigations without the teacher's supervision? If so, how?*

The responses to this question portrayed two interactive shortcomings; firstly, learners seemed not to be acquainted with what practical investigations are, which showed that they were not familiar with the concrete approach in learning. This further meant that they were not used to working independently. Hence this was confirmed by one teacher participant during the focus groups discussions. T6 said: "*our learners are spoon-fed from lower grades and by the time they come to the Further Education Band, they can hardly respond to active learning".* Secondly, this question revealed the dominant teaching and learning approach practiced in the selected schools, that is, the teacher-centred method. The fact that learners did not even understand what practical investigation meant, let alone conducting practical work themselves, proved

that they mostly relied upon their teachers whom they looked at as ‘know all’. Weimer (2013:1) is against this approach when saying that *“life-long learning happens when students have the opportunity to practice and continuously obtain feedback on their own*”. Therefore, this study concluded that when learners are subjected to teacher-centred methods, they fail to work independently.

During the focus group interviews, learners were called upon to discuss their learning styles. The purpose was to establish their learning habits as well as whether they were used to discovering information on their own as well as to uncover their beliefs about learning. Hence, the question was framed as follows:

> *Between discovering information on your own and relying on your teachers, what in your opinions is the most effective way of learning?*

Learner participants differed in terms of their preferences; some conceded that teachers were their best sources of information while others thought teachers, like any other human beings, cannot be able to provide them with all the information they are supposed to get. Another point was that they like to be encouraged to find information on their own since information gathered from self-discovery lasts longer. Overall, it became obvious that learners were aware of their role in their learning.

The follow-up question was: *Where and how do you get such information?*
Most teachers indicated that they read from their textbooks but admitted that in most cases they find it difficult to fully understand when reading on their own. Few of them mentioned a cell-phone or the internet as their other resource in case they have data bundles. However, it also came to the surface that few of them have smart phones.

When responding to the question on how and where learners get information, L1 said: “We *listen to the teacher during the lesson, take some notes and go home to study those notes*”. To a large extent, the actual problem pointed to both the lack of resources and their inability to work independently. This further reflected their poor studying habits as the cause of their poor performance in the subject. The

combination of poor teaching methods that do not include a learner-centred approach, lack of relevant resource materials as well as poor study methods on the part of the learners are therefore apparently toxic mixtures that make Physical Science appears to be the most difficult subject, which is not the case.

4.2.2.3 Lack of resources as a deterrent to independent and self-centred learning

To find out how learners do their tasks amid the gross shortage of resources, the next question was:

> *Which resource materials do you normally use when you do your tasks?*

The role of resources in a learner-centred environment is also clarified by Pham (2011), when examining factors that affected student-centred learning approach in Vietnam (Inayatullah, 2004). He also identified the fact that it is not easy to implement any change because new approaches face various barriers in terms of both infrastructure and resources in the local context. One such barrier in South African rural schools is the lack of libraries.

- **School library**

Learners were well aware that libraries are meant for conducting independent research which encourages learner-centred pedagogy. However, few of them have fully functional libraries in their respective schools. Those who conceded that there were at least classrooms that were called libraries indicated that there were no useful references in those structures. They also stated that even their teachers do not encourage them to use those 'libraries'. Hence, it is on very rare occasions that they use their school libraries. Most learners said that they preferred to use city libraries over weekends. However, that rarely happens as they have to travel long distances to reach them. Nevertheless, they confirmed that at times they were compelled to go there when their teachers insisted. One of the participants said, (L2) *"Even if it is far,*

I am sometimes forced to go there to complete my homework. Otherwise my teacher will punish me".

- **Laboratory**

Generally, learners understood that laboratories are meant for doing practical experiments and investigations. Supporting this notion, Tuaundu (2013:234) explains that *"positive learning environment in a laboratory also stems from the availability of equipment and chemicals for learners to use".* Similarly Hofstein and Lunetta (2003:32) echoed that *"laboratory activities appeal as a way of allowing students to learn on their own and, at the same time, engaging in a process of constructing knowledge by doing science".*

The process of constructing knowledge by learners themselves is one of the foundations of a learner-centred approach. However, the investigation in this study revealed that the majority of the said schools do not have laboratories and insufficient equipment. Worse still, none of them used laboratories for the teaching and learning of Physical Science. Instead, most sampled schools used ordinary classrooms. That said, learner participants further explained that their subject teachers sometimes borrow Physical Science apparatus from other schools to conduct experiments. Even then, teachers are the only ones who conduct those experiments, not learners. This borrowing process proved to be a very tedious and difficult exercise since those lending schools have to use them for their learners as well. Dillon (2008:3) denounces this practice by arguing that *"for learners to master some complicated Chemistry concepts, they should ideally do practical experiments on a regular basis"*. Also, learners further pointed out that in most cases the apparatus usually comes long after they have done the relevant chapters. As L3 said "*Sometimes the apparatus arrive long after we have completed a particular lesson and these tampers with our learning momentum as we have to go back and forth".*

This has shown that learners are denied a sense of ownership and have irregular access and use of a laboratory and its relevant apparatus. Tuaundu (2013:136) objected to this practice by insisting that "*Creating a sense of ownership of equipment*

and laboratory activities among learners by the teacher can help in creating positive learner-centred environment".

The absence of laboratory in the teaching and learning of Physical Science denies learners critical scientific skills that only a laboratory can provide.

Bennett and O'Neale (1998) refer to the skills that can be developed in good laboratory exercises as the following:

- Manipulation equipment;
- Experimental design;
- Observation and interpretation;
- Problem solving and critical thinking;
- Communication and presentation;
- Data collection, processing and analysis;
- Laboratory know-how, including developing safe working practice and risk assessment skills;
- Time management;
- Ethical and professional behaviour;
- Application of new technologies; and
- Teamwork.

The fact that learners who are taught Physical Sciences without access to laboratory equipment miss such critical skills, proves not only the poor learning quality which they are subjected to, but also emphasises that learning under such conditions is still teacher-centred.

In addition, Nakhleh, Polles and Malina (2002) have presented the following to highlight skills related to laboratory use:

Table 4.2 Skills related to laboratory use (Nakhleh, Polles & Malina, 2002)

Traditionally acquired skills	**Laboratory acquired skills**
Observation	Manipulation
Data collection	Data collection
Problem solving	Processing and analysis of data
Teamwork	Interpretation of observations
Communication	Experiment design
Presentation	
Laboratory know-how	

The above-mentioned laboratory acquired skills by Nakhleh et al., (2002) can only be achieved where a laboratory is accessible, and make it possible for a learner-centred approach to be implementable. This highlights the significance of a school laboratory in the adoption and implementation of learner-centred teaching. The fact that the participants selected for this study had limited access to laboratory activities implies that their learning of Physical Science is still teacher-centred, which means that learners mostly memorise knowledge instead of embarking on the self-discovery approach.

Given the importance and value of skills a laboratory can help to develop, the researcher concurs with Jamison (2001:3) when positing that *"the basic scientific methods of inquiry developed through Chemistry in learners can be easily applied to other subjects in solving problems; and can also be used in helping learners cope with the ever changing technological development that has become so much part of our lives".* Hence, learners who are subjected to the learning of Physical Science, especially the Chemistry part, without access to laboratory, are more likely to perform well even in other subjects.

- **Computer-related technology**

Few learner participants confirmed that at times they rely on their cell phones. However, this seemed to be an exclusive privilege to those who have smart phones. To probe further, learners were asked whether they were able to access the internet

in their respective schools. Sadly, none of the participants had any access. This further revealed the socio-economic conditions of their schools. On further probing to establish whether they have access to the internet in their respective homes, the responses were varied; while most did not have any form of access, some claimed to do so. Their inability to access internet even at their respective homes further denies them opportunities to work independently or discover knowledge on their own, which is a critical requirement of the learner-centred approach. When assessing the relationship between a learner-centred teaching approach and the role of computers in the teaching and learning of Physical Science, Forcier (1999) points out that ICT in education is used as learner-centred instruction. In addition, Wellington (2004) explains that different software, such as simulations, could be used to make teaching and learning of Physical Science more meaningful. Therefore, for the participants who claimed to have limited access to the internet, it became obvious that they were unable to exploit numerous computer programs that could enhance their learning. By internet access, they mostly referred to Google. This implied that learners from the selected schools are denied a number of computer application skills that could go a long way to improve their learning and at the same time making them compliant with a learner-centred approach. None of the participants had either knowledge of or access to the following computer applications:

- **Word processing**

This type of application can assist in terms of self-discovery learning particularly in terms of using correct grammar when presenting their findings, especially after conducting a Physical Science experiment. This is due to the fact that word processing has a feature that tracks down some spelling mistakes and some grammatical errors. Furthermore, reports written through word processing can be saved for future references when preparing for examinations.

Having checked learners' exercise books as part document analysis, the researcher noted that this application would have been much helpful in improving learners' use of English language. Most learners in the schools under investigation have a serious challenge of getting their spelling and English grammar correct.

- **Spreadsheets**

This is a practical classroom resource and has the potential to help Physical Science learners to address increasing demands on their time and energy. Wellington (2004) points out that data experimentation on topics such as current, voltage, resistance and power as part and parcel of the Physical Science curriculum could be correlated As teacher participants complained about long Physical Science syllabi, more paper work in addition to the pressure of completing their syllabi, the researcher is certain that this resource can go a long way in saving their time and energy.

- **Databases**

For Physical Science, databases can be very helpful in learning topics, such as Periodic Tables by allowing learners to search through information in a faster, more flexible way. Wellington (2004) further speculates that learners are able to connect and compare one set of figures with another. An example of a Physical Science database (National Institute Standards and Technology Laboratory, 1994) includes atomic physics, electronic and optical physics, time and frequency. When a learner clicks on any topic from the database, it leads to other information relevant to the topic clicked.

According to the researcher, this device can help alleviate the challenge of the lack of resources prevalent in rural schools. Like most computer devices, it can also bring variety in learning which has an element of motivation.

- **Communication tools**

Communication tools ensure extended communication not only between learners and their teachers, but also among individual learners as well as the study groups. Hence, communication is not restricted to physical meetings. Through emails, teachers manage to communicate with their learners even outside contact times. Group discussions and collaboration become possible through video conferencing as well as online discussions.

E-mails in particular, can come in handy in rural schools where learners stay far from each other and face-to-face meeting happens during school hours only. This technology can assist to enhance communication among learners even outside school hours. Through video conferencing, group discussions can be held even during weekends and vacations. Teachers can also be able to conduct classes outside school hours.

- **Simulations**

The researcher believes that simulations can go a very long way to make up for the non-existence of laboratories since they can enable learners to do their own experiments through the process of simulation. Hence, Qhibi (2006:24) states that *"there are many free simulations, which can be downloaded from the websites at little or at no cost at all".* For this reason, the researcher considers ICT and simulations as the best substitutes where science laboratories are not available. Also, learners have many opportunities for learning through ICT and simulation as they learn by doing, receive information and refine their understanding on a continual basis in order to discover new and own knowledge.

However, Trowbridge and Bybee (1996:191) argue that experimentation through computer simulation should not replace the traditional laboratory experimentation, as it develops certain skills such as acquisition, organization, creativity and manipulation. Again, there are serious cases where simulation only is not sufficient for discovery learning.

The other advantage of simulations is that they are cost-effective as there is no need to buy some of the expensive apparatus and materials needed to show the processes and the phenomena as in the case of science laboratories.

Given the limited resources in the selected schools, it is not only the quality of education that is compromised, but it also makes it impossible to fully implement a learner-centred approach. Furthermore, there are serious grounds for demotivation among all stakeholders due to lack of resources that enhance effective learning. For

this reason, the chances of rural school learners having to excel in a resource-dependent subject like Physical Science are seriously compromised.

4.2.2.4 Learners' and teachers' perceptions about Physical Science

From the researcher's conjecture, another factor that negatively affects the teaching and learning of Physical Science is related to a pigeon-hole in which the participants consciously or unconsciously have locked themselves. Throughout the participants' discussions, they labelled Physical Science as the 'killer subject', and showed that they have succumbed, thus admitting that there is chronic poor performance in the subject nationally but particularly in their schools. During the interviews, (HoD1) remarked that "because *even in urban schools learners struggle to pass Physical Science, I do not think that our schools should continue to offer Physical Science"*. The researcher found this labelling psychologically damaging. This, according to the researcher, creates an unfortunate comfort zone to both educators and learners since it gives them an undue protection which endorsed Physical Science as an insurmountable challenge. Hence, failing the subject is somehow accepted.

The negative labelling of this subject does not only destroy the teachers' confidence, but even that of their learners. In one of the focus groups discussions, a Grade 12 teacher (T9) said: *"I do not understand why these learners chose to continue with Physical Science because they have never passed it from Grade 10"*. It is for this reason that Qhibi (2006:7) concludes that "*irrespective of different strategies employed by teachers to teach Physical Science at high school level, many learners have no confidence in the subject".* The impact of this can further be seen by the dwindling number of learners who follow the Physical Science stream, particularly in rural schools. For this trend, the researcher is concerned that although Physical science is one of the most essential disciplines, only few see it as an area of study that they would wish to pursue in Grade 10 and onward.

4.2.2.5 English Language as barrier to learning

Another challenge was that of the language barrier. This does not only place learners at a disadvantage, but it also contributes to a learning breakdown. One teacher

interviewee (T9) remarked that, "*Learners' English literacy level is very poor. I have to translate almost everything into IsiZulu*."

This means that teachers had to teach in IsiZulu for learners to understand even though all forms of assessment are in English which makes learners to fully depend on the teacher. This finding is also supported by Sunzuma (2012:151) who indicated: *"This challenge of code-texts is often too difficult for children…in developing countries where pupils are learning through English as the medium of instruction".*

On the other hand, this switching is criticized by Dempster (2010), when arguing that the informal code-switching medium fails when assessment is conducted in English. Although the aim of teaching students Physical Science is for them to develop skills and use them, the ability to tackle the problems requires comprehension and interpretive skills. The challenge of poor literacy and numeracy levels has made international headlines. Mouton, et al. (2012:1214) posited that "*the educational crisis must be seen against the background of South Africa's lackadaisical performance in comparative international benchmark trends in literacy and numeracy".*

Haddow-Flood and Wiens (2013:14) provided statistical information that depicts the levels of innumeracy and illiteracy in four provinces, namely; Limpopo (60.6%), Eastern Cape (50.3%), KwaZulu-Natal (44%), and Mpumalanga (43.8%), rural schools (55.2%), Quintile one schools (58.7%), Quintile two schools (48.9%) and Quintile three schools (47.4%).
From the above percentages, it should also be noted that the selected schools are located in KwaZulu-Natal (50, 3%). They are also between quintiles 1 and 2 (58, 7%) and they are rural schools (55, 2%).

Gernetzky (2011:1) posits that such poor performance in these learning areas, which are considered the foundation of learning, suggest that those learners lack the rudiments of effective learning. The researcher regards English language proficiency as the basic tool of learning, particularly where English is a language of learning and teaching.

The researcher opines that learners' poor English language proficiency imposes the following learning limitations:

- A challenge to effectively access information from print independently; therefore, they will have to rely on their teachers to explain in their vernacular;
- Inability to construct meaning and to reconstruct new knowledge;
- They may also have trouble forming information or following a line of reasoning; and
- In the case of Physical Science learners, they cannot manage to keep track of a set of instructions or fully understand the instructions given to conduct an experiment.

The above limitations dissipate any possibilities of independent learning and self-discovery learning which are considered important parts of the learner-centred approach.

Table 4.3: Percentage of learners rated as functionally illiterate and functionally innumerate distributed according to Quintiles (SACMEQ, study by Moloi & Chetty 2011)

Quintile of school	**Functionally illiterate %**	**Functionally innumerate %**
Quintile 1	44.7	58.7
Quintile 2	34.4	48.9
Quintile 4	20.	35.4
Quintile 5	1.4	4.6
Total	**27.2**	**40.2**

Table 4.4 Percentage of learners rated as functionally illiterate and functionally innumerate by classification of school [Data from The SACMEQ III project in South Africa: A Study of The Conditions of Schooling and the Quality of Education by Moloi & Chetty 2011)

School location	**Functionally illiterate %**	**Functionally innumerate %**

Isolated	38.8	56.2
Rural	41.3	55.2
Small town	16.7	32.9
Large city	11.4	20.7
Total	**27.2**	**40.2**

Although the above information was taken from grade 6 South African learners, a trend suggests that most learners who get these learning shortfalls come from rural, disadvantaged and low quintile schools. And, the researcher cogitates that learners from the selected schools in this study acquire these learning deficits from their primary schools. Sadly, they remain functionally illiterate and innumerate throughout their academic lives. According to Collins Dictionary (2014), functional literacy refers to a person with some basic education who still falls short of a minimum standard of literacy or whose reading and writing skills are inadequate for everyday needs.

Steward (2010) refers to functionally numerate learners as those who have *"very basic competence in maths, mainly limited to arithmetical computations and some ability to comprehend and use other forms of mathematical information".* He argues that *"while this is valuable, it is clearly not enough to deal confidently with many of the mathematical challenges of contemporary life".* These two terms, i.e. functional numeracy and functional literacy, perfectly relate to the types of learners sampled in this study. The environment in which they reside, their educational background and their school quintiles render them both 'numeracy and literacy' functional. Based on the two definitions, the researcher argues that these types of learners cannot adapt to a learner-centred approach as they lack basic skills to effectively and independently acquire information on their own.

In terms of Section 6 of the Language in Education Policy Act (Act 27 of 1996), School Governing Bodies are empowered to determine the language policy of schools within guidelines set by The National Department of Basic Education and on the provincial level. Implementing this policy is easier said than done given the fact that there is an insufficient reading material in vernacular languages. Hence, Haddow-Flood and

Wiens (2013:21) contend that *"It is often commented that one of the remaining legacies of apartheid is that English continues to be the country's language of business, politics and communication".*

The following table indicates the percentages of learners in relation to languages in which they are taught and the grades that they are doing.

Table 4.5 Percentage of learners by language of learning and teaching and Grade: 2007

LOLT	Gr 1	Gr 2	Gr 3	Gr 4	Gr 5	Gr 6	Gr 7	Gr 8	Gr 9	Gr 10	Gr 11	Gr 12	SA
Afrikaans	9.5	9.6	9.9	12.3	12.2	12.2	13.2	13.1	14.0	12.7	12.1	12.8	11.9
English	21.8	23.8	27.7	79.1	81.1	81.6	80.6	80.9	80.0	81.2	82.0	81.4	65.3
IsiNdebele	0.7	0.8	0.8	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.4
IsiXhosa	16.5	15.0	14.0	3.1	2.5	2.0	1.9	1.6	1.4	1.3	1.2	1.5	5.5
IsiZulu	23.4	21.7	20.1	1.5	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	6.8
Sepedi	8.3	9.1	9.2	1.1	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	3.1
Sesotho	4.7	4.8	4.4	0.5	0.4	0.3	0.4	0.4	0.5	0.5	0.4	0.3	1.6
Setswana	7.5	7.4	6.8	0.6	0.5	0.5	0.6	0.6	0.7	0.6	0.5	0.3	2.4
SiSwati	2.1	2.1	1.7	0.4	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.7
Tshivenda	2.2	2.4	2.4	0.3	0.2	0.2	0.2	0.4	0.5	0.5	0.6	0.5	0.9

Xitsonga	3.1	3.3	3.1	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	1.4
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: DBE, LOLT Report, 2010d

The above table indicates that, in 2007, 65% of learners in the school system learnt via the medium of English, while 12% learnt via the medium of Afrikaans and 7% learnt via the medium of isiZulu. Approximately 75% of learners in the school system learnt via the mediums of English and Afrikaans in 2007. It should be noted that IsiZulu is the home language for all learners in all the schools under the investigation. The above table clearly indicates that until 2007 above 81% of learners in Grade 10 to 12 were taught in English. Only 1.1% received their instruction in their vernacular language. Given the poor language skills as confirmed by the ANA results (2011), particularly in rural schools, those learners are struggling to find information on their own and this scenario adversely affects the learner-centred approach.

However, the researcher noticed that English language challenge is not only restricted to learners. In all schools investigated in this study, Physical Science teachers themselves were struggling to communicate in English throughout their lessons. In the majority of cases, the main parts of their presentations were in IsiZulu. Although scientific concepts were firstly introduced and explained in English, it was a common tendency to repeat them in IsiZulu. The researcher is adamant that such practice is helpful to learners who were to write their examinations in English.

The table also shows that nationally 77.2% (65.3 +11.9) of African learners who were doing Grade 12 in 2007 were not taught in their mother tongue. Hence, the first challenge they encountered was that of a language barrier. The implication is that before they can understand whatever concepts they had to learn, they have to struggle with linguistic constraints every non-speaker of the language contends with. The obvious implication is that learners who are not taught in their home language

spend most of their time to catch up in English instead of learning the concepts of the contents should be learning.

This on its own has a negative impact on the adoption of a learner-centred approach, as this imposes limitations on learners to gather information on their own. They thus end up relying on their teachers to explain even the meaning of words, terms and concepts. As the challenge of insufficient textbooks has been mentioned, dictionaries are not even considered in the funds allocated for the learners and teachers' resource materials (LTSM).

The researcher concurs with the rural school Physical Science (HoD2) *"that poor language skill, particularly English as the language of teaching and learning (LOTL), is one of the fundamental challenges that affects quality teaching and learning"*.

4.2.2.6 Learners' low confidence and level of motivation

To establish the level of motivation as well as the confidence the learner participants had on the subject, the question that was asked was:

> *How do experiments help you to better understand Physical Science?*

This question was asked to establish whether or not learners understand the importance of experiments in the learning of Physical Science, and how often they get access to science apparatus to conduct experiments. The other intention was to establish how experiments were conducted; that is, whether learners do the experiments themselves while the teacher is simply coaching them or whether they sit still and looks at the teacher doing experiments on their behalf.

What transpired from the participants' discussion was that learners were of the opinion that they are not allowed even to touch the apparatus. During the focus group discussions L10 even stated *"teachers seem scared that we will break those borrowed apparatus"*. This restraint was out fearing that if learners break those borrowed apparatus; the school might have to replace them. Furthermore, they

seemed content by just looking at their teachers conducting experiments on their behalf. However, they confirmed to be interested in performing them and even indicated that experiments helped them to understand better than just reading from their books or listening to their teachers' explanations.

The participants' opinions showed that due to the shortage of LTSM, their right to quality education is somehow compromised. They have developed an erroneous belief that only their teachers can decide how they should learn and what resources they are allowed to use. This further accentuated that learner-centred teaching and learning is still a castle in the air for most of the schools under investigation.

Theme 3

4.2.3 The impact of the rural environment

To ascertain how the rural environmental challenges affected the teaching and learning of Physical Science, the following question was asked:

> *"Do you believe the environment in which the school is located has any bearing on the quality of the teaching of Physical Science? If so, what is the impact*?"

The issue that relates to environment and the quality of education was also raised by Weinstein (1979) and McGuffey (1982). These authors alluded to two major US research reviews that revealed that thermal, visual and acoustic factors and the effect of colour consistently had a direct impact on students' and teachers' ability to concentrate on learning tasks, and that this affected student attainment.

The table below brings together the factors identified as significant in influencing self-regulated learning:

Table 4.6 Factors identified as significant in influencing self-regulated learning (DETYA 1999)

Structural factors that influence	**Cosmetic factors that influence**
Building age	Interior painting
Windows	Exterior painting
Flooring	Floors swept
Heating	Graffiti
Air condition	Furniture
Roof leaks	Landscaping
Adjacent facilities	
Lock conditions	
Ceiling material	
Equipment	
Lightening	
Noise	
Student density	

Adapted from Australian Department of Basic Education, Training and Youth Affairs (DETYA, 1999)

Another concern all the interviewees expressed was the passive nature of the learners they were teaching. However, the impact of the environment does not influence learners only; teachers are also equally affected. Clark (2002:20) further notes that "*there was a considerable effect on teacher morale. The quality of working environment gives strong visual messages. It tells people what you think of them. People believe what they see and experience rather than weasel words. Poor buildings say that you don't have a value in the system".*

This confirmed a response from (HoD3) who said: *"The physical environment in which this school is built does not have any inspiration. At times I think it would be better for the parents to spend money on transport for their children rather than going to township schools because everything is discouraging here".*

The participants conceded that the socio-economic realities of the rural schools are not conducive to quality teaching and learning. They mentioned the very geographic challenges, home background, and rampant poverty as the main impediments that

affect their learners. HoD4 said: *"When this democratic government came into power, we hoped it will confront the plight of rural schools as most of the current government leaders have first-hand experience of rural education*". The link between rural education and it socio-economic conditions were also noted by Surty (2011:8) when stating that "*socio-economic conditions invariably play a role in quality education*."

The other challenge faced by rural schools is the shortage of resources. This has a direct impact on the quality of educational instructions possible in rural areas. As mentioned above, all schools under this investigation lacked basic educational resources like school laboratories and school libraries as well as access to the internet. This invariably foils teachers' attempts to implement learner-centred teaching. Therefore, this gives former Model C schools (schools that previously belonged to the privileged racial groups and were better funded) an advantage because they are well resourced and better equipped to implement a learner-centred approach. Hence, Surty (2011:9) confirmed that *"The teaching methods that teachers use in rural schools are in many instances inappropriate for their particular context".* The participants mentioned the geographical position of their schools as far-flung from centres of information, which makes it difficult for them to access development workshops. They cited fiscal liabilities they incur if they have to attend departmentally sanctioned workshops. Unlike their urban counterparts who spend little to reach those workshops that are always conducted in urban centres, rural school teachers have to spend more money to get to those venues. This point is consistent with Gordon (2009), who asserted that *"Teaching education became more centralized and located mostly in urban areas and as such, became less accessible to students from rural areas".* In many cases the schools have no money to send them to such workshops and, as a result, they have to pay for themselves. At times, it becomes impossible for rural school teachers to attend those workshops. This was confirmed by HoD5 who said: "*it is not always possible to pay transport fees for teachers to attend workshops, especially when the school is still waiting for the department to provide its financial allocation"*.

Disturbingly, the teachers gave their learners no chance of excelling in Physical Science. Also, they predicted that Physical Science as a subject will ultimately fade

away in their respective schools. They felt that Physical Science requires background from lower grades but unfortunately their learners reach Grade 10 without any meaningful background upon which a scientific reasoning and learner-centred approach could be developed. They blame this on educators in lower grades who themselves have no science background and in their teaching of Natural Sciences prefer the Biology (Life Sciences) part at the expense of the Physical Science sections.

4.2.3.1 Recruitment and maintaining adequately qualified teachers to implement learner-centred approach

The findings of this study also established that rural schools are struggling to recruit and retain suitably qualified and experienced Physical Science teachers. This became more apparent when most HoDs were responding to the question on whether they can confirm if their schools were able to recruit and maintain adequately trained and experienced Physical Sciences teachers. HoD 6 said: "…*even the teachers that are working here are waiting for whatever opportunity that will be available in township schools".* HoD7 echoed: *"Nobody wants to spend his or her entire life under these conditions".*

All respondents to this question made it clear that better qualified and experienced educators particularly of Physical Science are difficult to recruit to their rural schools. They pointed out that even young people who were born, raised and educated in rural areas, once they qualify as teachers do not want to work in their communities; instead they go to urban schools. HoD1 reported that *"Physical Science educators do not have a problem of finding a job wherever they want because the system produces very few of them".*

The following assertion paints a vivid scenario of teacher shortages in KwaZulu-Natal. As Jansen (2013:1) report, "*Despite the hundreds of millions spent on university bursaries for new teachers, the KwaZulu-Natal Education Department may have to continue to employ unqualified Maths and Science teachers because their suitably qualified counterparts are failing to take up vacancies in rural schools".*

Unqualified teachers by definition are not professionally trained in any method of teaching. Therefore, it is hypocritical to expect them to be competent and well-versed with learner-centred approaches. It is for such reasons that rural schools are still trapped with unqualified teachers who still largely apply teacher-centred teaching. Jansen (2013:1) supports this by saying that "*in the Department of Basic Education in KwaZulu-Natal only 98 of 1 118 posts remained occupied. These were vacant because teachers had refused appointments in rural schools as a result of unacceptable and unfavourable conditions".*

HoD2 averred *that "in most instances learners stay up to 6 months without a Physical Science teacher".* The researcher considers this scenario as a serious contravention of learners' constitutional right to education. The interviewees further claimed that those teachers, who eventually come, are either not qualified or under-qualified if at all. It is common knowledge that they will also leave when they find vacant posts in urban schools. Hence, there are educators who do take up positions in rural areas, but some do so reluctantly given the practical problems experienced (Emerging Voices, 2005). The study discovered the following as the most daunting challenges for the teachers to work in rural schools:

- **The poor working conditions**

These ranged from lack of resources, neglected infrastructure, and poor living conditions and unhygienic conditions. These unsuitable living conditions are a turn-off to most teachers, especially those whose qualifications are sought-after.

- **The neglect of rural educators by the department**

Attempts to pay rural allowance to KwaZulu-Natal teachers were marked with errors, abuses and possible fraud in the payment of rural allowances to non-qualifying teachers. Ultimately, the KwaZulu-Natal provincial Department of Basic Education halted the payment of rural allowances. HoD4 said: *"Rural school teachers are the worst neglected civil servants".* Part of neglect, according to the participants, is attributed to a toxic leadership by the Department of Basic Education,

which is characterised by pathetic administration which cannot even identify the basic infrastructural needs of the rural schools like providing toilets and sanitation, water, quality classes and reliable security. Hence, working in such conditions can hardly be by choice.

- **Transport fees to reach those schools**

Most of the participants are not residing in their school communities. They have to travel from their respective homes from nearby townships on a daily basis. Unlike educators who are working closer to their homes, rural educators do not have more time with their learners. For rural educators, afternoon and Saturday classes are not easy to conduct. This is due to the poor transport system in rural areas. Those who use their transport cannot always afford petrol costs. They also mentioned poor road conditions which adversely affect their cars.

4.2.3.2 Non-existence of rural incentive

T11 said: "*The department is not helping in terms of recruiting and retaining scarce subject educators in rural areas".* This was despite the fact that in 2007, the National Treasury allocated funds for rural incentives to all provincial departments.

Rural teachers have to deal with high transport costs, wear and tear on their vehicles, long distances, and poor road conditions without any compensation in the form of incentives. These are some of the reasons that make rural schools struggle to get and retain better qualified Physical Science teachers. As long as rural incentives for scarce skills and possible accommodation allowance are not provided, attracting teachers to rural schools will be hard to achieve.

Theme 4

4.2.4 Poor teacher-development programmes

The researcher unequivocally supports Barber and Mourshed (2007) in their conviction that the quality of an education system cannot exceed the quality of its teachers. In this study, the researcher further scrutinized the quality of support given to rural school educators in aspects such as learner-centredness. This particular focus was to establish how rural teachers are empowered in terms of understanding, adopting and implementing learner-centred teaching. The following findings emerged:

4.2.4.1 Evaluating teacher-development programmes

During all the focus group discussions, teachers were called upon to explain the types of training, support or any assistance they received from government to prepare them to effectively implement learner-centred teaching. The questions were asked in order to find out the type of support that specifically speaks to the methodology and content aimed at empowering educators in understanding and implementation of a learner-centred pedagogy.

From the educators' responses, it became apparent that none of them has received proper training on implementing learner-centred teaching. To this end, the researcher inferred that teacher educational programmes do not focus on critical concerns for knowledge, and that the level of information provided to teachers in in-service programmes is of dubious standards. Hence, T12 said, *"the only workshops conducted by the subject advisers are the orientation workshops at the beginning of the year"*. This is inconsistent with the three-pronged multidimensional approach recommended by Fullan (1982), namely:

- The development of teaching materials;
- Development of teaching approaches; and
- Alteration of teacher beliefs.

According to the findings of this study, the above factors are critical development priorities in the context of South African teachers. South African teachers are the product of the traditional teacher-centred learning, which did not so much rely on the

use of teaching materials. As pointed out in section 2.4.4., as long as school teachers do not understand and accept the new set of ideas as a worthwhile alternative, they tend not to change their classroom practice. Instead they tend to persist with their habitual ideas. This scenario is further echoed by Lorsbach and Tobin (2003:6) when they admit that *"traditional teaching practices are sometimes difficult to discard".* Hence, teachers need to be trained and require information relating to the present skill levels and teaching styles necessary to facilitate the implementation of curriculum innovations, including learner-centred methods of learning and teaching.

Most participants in this study revealed that the workshops they have attended ranged from OBE, to NCS and CAPS. The contents of all of them included the changes in terms of syllabi, the notional time of subjects, assessment requirements and the changes in terminology. To them, the learner-centred approach is a theory they formed from their understanding of the literal meaning of the words, coupled with disjointed comments from incidental sources.

The professional support and teacher development in the South African context is the responsibility of the Department of Basic Education from the National Department, Provincial departments, Districts and their respective Circuit Management centres. However, despite having managed to successfully formulate numerous empowering educational policies, their implementation has been disappointing. It is for this reason that the South African Department of Basic Education (2005) acknowledged that in some districts there has been no meaningful support for some time. This is particularly true in rural and historically disadvantaged areas. They also remarked that, even if support is available, it is often fragmented and uncoordinated and to unite such into cohesive teaching activities that work is a challenge (DoE, 2005).

Dass (1999:2) reported that traditional 'one-shot' approaches to professional development have been inadequate and inappropriate in the context of current educational reform efforts. These approaches are also out of step with current research about teacher learning (Kyle, 1995; Lieberman, 1995). Ball and Cohen (1999:5) indicated that professional development of teachers is *"intellectually*

superficial, disconnected from deep issues of curriculum and learning, fragmented and non-cumulative". Kriek and Grayson (2009) suggest that teachers need development along three simultaneous dimensions, namely; content knowledge, teaching approaches and professional attitudes. Sadly; educators from the selected schools are denied opportunities to engage in any focused and prolonged training aimed at enhancing their teaching approaches learner-centred pedagogy.

4.2.4.2 Inappropriate teacher development programmes

To determine the quality and the relevance of teacher development support concomitant with the rapid curriculum changes that accompanied educational innovations in South Africa, the following question was asked:

> *In order to keep pace with the curriculum changes prevalent in South Africa, what types of professional developments do Physical Science teachers receive?*

A World Bank study on secondary education in Africa revealed that, for teachers to be effective and competent, they should have curricular (subject) knowledge, pedagogical knowledge (on how to teach), as well as societal knowledge (Dehaloo, et al., 2013). This question was aimed at establishing whether the type of development they get covers both the content knowledge as well as teaching methods that are consistent with learner-centred teaching.

The researcher considered this question crucial, given the fact that the post-1994 educational changes in South Africa were meant to move away from the traditional teacher-centred approach to a learner-centred approach. To this end, the researcher agrees with De la Sablonniere, Taylor, Sadykova (2009:7) who insist that *"to achieve successful social change in terms of education, there are two necessary steps in order to maximize the likelihood of constructive change in education. First, a student-centred approach needs to be clearly and simply articulated. Second, mechanisms are needed that allow for every stakeholder in the education process to be fully informed about the processes arising from educational reform"*.

The researcher reckons that intensive and on-going learner-centred workshop should have been organised. Rural teachers should have been prioritised. Required resources upon which learner-centred is dependent should have been prioritized.
As stated in section 2.7.1, Balfour (2014) argues that teacher educational programmes focus on uncritical regard for knowledge, and that the level of knowledge provided to teachers in in-service programmes is of questionable standards. In terms of CultureShift (2012:16), extensive research emphasises that effective professional learning opportunities should:

- be intensive, on-going, and connected to practice.
- focus on student learning and address the teaching of specific curriculum content.
- align with school improvement priorities and goals.
- build strong working relationships among teachers.

HoD4 stated that "*despite the introduced changes in terms of teaching methods linked to the educational innovations, no decisive attempts were made to train or empower teachers on learner-centred teaching. Furthermore, departmental officials neither examine nor empower teachers on how to implement learner-centred approaches*".
Also, it became apparent that the subject advisors that frequently visit schools never inquired or made any input on the methodology that educators were using. (T13) said: "*No subject advisor is concerned about what methods we use as subject teachers. Their only concerns are what and how much we have taught*". This revealed the obsession by officials about completing the syllabus and assessment scopes to ensure that learners are prepared for tests and examinations. This spirit encourages teachers to employ teacher centred teaching instead of inquiry-based learner-centred approach. They also indicated that for years they had only one workshop which lasted for a few hours. Those are called orientation workshops held at the beginning of each year and the contents are mere remarks about the previous year's performance as well as discussions about the annual teaching plan and assessment programmes.

Dass (1999) critiques the traditional 'one-shot' approaches to professional development as being inadequate and inappropriate in addressing the developmental needs of teachers. Equally, Kriek and Grayson (2009:198) stated that a *"longer, sustained and intensive professional development programme is more likely to have an impact than a half-day event or a few after-school".* Furthermore, this imperative is encapsulated in the National Strategy for Mathematics, Science and Technology that expressed the need for higher education institutions within Department of Basic Education (DoE, 2001) to develop rigorous, high quality and relevant training programmes for teachers that will strengthen both subject matter expertise and pedagogical content knowledge.

According to Corcoran, Fuhr-man and Belcher (2001), some critics have even argued that districts are inherently incapable of stimulating and sustaining meaningful reforms in teaching and learning because of their political and bureaucratic character.

4.2.4.3 Inapt support of departmental officials

Murphy and Hallinger (2001) as well as Massell (2000) caution that *"neglect of the district offices and their officials can be done at the peril of the new curriculum and policy reform implementation at the contextual level".* The researcher considered it important to assess the role of departmental officials in supporting rural schools to implement curriculum innovations, particularly in empowering teachers to adopt a learner-centred approach. As standard practice when visiting schools, departmental officials have to indicate the purpose of their visit in a record register known as log book. They have to clearly stipulate who they are visiting, when and for what purpose. In all 18 schools, principals were keen to share the contents of their respective log books. In some cases, some log books dated as far back as 2010. However, the entries made by the departmental officials were not always clear in terms of the purposes of visits. Nonetheless, the documents that correspond with their dates of visits and the testimonies by those who remembered helped the researcher to fully grasp what transpired during those visits.

By perusing the school documents, particularly the logbooks where the purpose of visit is normally indicated, the researcher wanted to find out whether departmental

officials, particularly the subject advisers, concern themselves with the appropriateness of methods used by teachers in schools. This could have informed the departmental role in promoting the use of a learner-centred approach**.** Also, their comments about methods used by teachers would have revealed the following:

- The subject advisers' understanding and competency. This information was important for this study either to crush or confirm contentions by Zengele and Coetzer (2014) when pointing out that it is a fact that there are several inadequately qualified and less-experienced persons occupying senior positions within the bureaucratic structure of the DoE; and
- Concerted intentions by the department to promote learner-centred teaching.

The departmental officials' purposes for visits are grouped into three categories, that is, school functionality, subject support and panel visits.

- **School functionality**

School functionality is understood as the process during which department officials check, among other things, the rates of absenteeism for teachers and learners, the availability of curriculum policy documents, school policy documents, school committees, records of meetings for various school structures and school enrolments.
In terms of KZN circular No.2 of 2016, a school functionality monitoring tool (see Appendix L) was issued to assess functionality in all schools in the KZN Province.

When analysing the aspects contained in the functionality assessment tool above, the resources that are being sought in terms of their availability are the textbooks, stationery and workbooks. The researcher, without understating the value of the mentioned resources, argues that such resources do not convince that their availability can ensure that a school has the ability to implement a learner-centred approach.

- **Subject support**

These visits are done by the subject advisors for particular subjects. In terms of the documents observed, in most cases the focus is on the following:

i Syllabus completion;
ii Learner performance during the year;
iii Teachers' adherence to their respective Annual Teaching Plans (ATP); and
iv Whether required prescribed assessment activities are done.

- **Panel visits**

What the researcher observed was that those panel visits are conducted once per term. This involves a number of officials representing various sections of the school. These include teaching and learning services (LTSM), school governance, teacher development, examination and assessment and management. In all their visits, the reason given is that of giving support to the schools. However, when scrutinising minutes of those visits, actual support is too insignificant to consider other than the panels' inquiries of whether schools comply with their expectations which were sometimes not clearly given before and at times not understood by the very panellists. What did not appear from all types of visits is how officials came to empower teachers in terms of how to implement a learner-centred approach. Also, in terms of auditing resource materials, their focus never went beyond the availability of textbooks.

Theme 5

4.2.5 Rationalization and redeployment policy

Despite good intentions by the government, the policy of rationalization and redeployment proved to be very complicated and disappointing. By implication, this meant that those schools with smaller learner enrolments should shed allocated teaching posts and those with growing enrolment would get additional posts. The advent of democracy meant the end of single race schools. Rural parents who could

afford to do so took the advantage and sent their children to former Model C schools in pursuit of better education. This led to the situation whereby learner enrolments grew in urban and township schools while in rural schools enrolments dwindled. This benefited advantaged schools in terms of post provisioning. Accordingly, rural schools are restricted in terms of the numbers of teaching posts. For this reason, schools with bigger enrolments are able to create more Physical Science posts and thus the few Physical Science teachers that the system produces are easily swallowed by the advantaged schools. It is for this reason that T14 said: "*Despite the diminishing enrolments in rural school, Physical Science teachers are still overloaded".* The researcher also observed that in most schools, there is only one Physical Science teacher for Grade 10 to 12. They blamed the policy of educators' redeployment. They also attributed the reason for the reduced enrolments in their respective schools to the fact that most parents, especially those who can afford to do so, prefer to send their children to the urban schools in search of better quality.

4.2.5.1 Heavy workloads

The participants agreed that the Physical Science syllabus in the senior phase is very challenging and interactive. In most cases, learners from the junior grades come to the Further Education and Training band (FET) without a Physical Science background. They pointed to a trend whereby Natural Science in Grade 8 and 9 is usually taught by educators who are not qualified in Physical Science. Subsequently, learners start engaging in Physical Science concepts in Grade 10. Therefore, Physical Science teachers have, in addition to their current grade syllabus, to start by replenishing the background which should have been done in junior grades. Those gaps are usually carried over until Grade 12. Unfortunately, this stretches the already lengthy syllabus of Physical Science in the FET phase and Physical Science teachers normally rush through the content and ignore learners who are struggling. This situation forces the teachers to concentrate on the teacher-centred teaching at the expense of learner centred approach. As HoD6 pointed out "*in addition to the daily activities, there are also prescribed tasks, monthly tests as well as quarterly examinations that must be done, all these must be marked".* He argued that "*This takes a lot of teaching time which makes it difficult to complete the syllabus*".

This confirmed the fact that teachers are guided by the summative examination system not only in the selected schools but in South Africa. Generally, this means that they rely heavily on recall and procedural application of results. As a result, Physical Science teachers in most selected secondary schools do not prioritise non-examinable skills that learners must develop during their learning. This further revealed that the teaching model that teachers follow throughout the year was mostly drilling the learners for tasks, tests and examinations, revising the past examination papers. Hence, the researcher concluded that the teachers were more concerned about the learners passing the examination than allowing learners to explore and discover information by themselves.

T15 acknowledged that, *"It is not necessary to assess the teaching methods that teachers are using; what counts are the results at the end of the year"*. For the researcher, this underscored a shared goal of a result-oriented teaching, which involves rote learning and memorizing answers for the examination, which discourages learner-centred pedagogy. Sadly, in the South African context, all stakeholders in education are still anxious about how learners perform during examinations. Parents, school authorities, teachers, Ministry of Education officials and even learners themselves are happy as long as they score high in standardized examinations. Conceptual understanding or the ability to solve non-routine problems does not bother them. From the HoD's remark about assessing the teachers' teaching methods, it became apparent that students' performance in examinations is their yardstick to evaluate teachers' teaching capability. HoD7 said: "*Physical Science teachers become frustrated when they are supposed to teach other subjects*". Further enquiry on this issue revealed that in most cases Physical Science teachers are given other subjects to teach. This apparently was meant to balance the staff teaching load in the entire school. Given the fewer number of Physical Science classes (not necessarily the number of learners in a class), Physical Science teachers end up with fewer teaching period to balance the staff loads. As a result, they are given the so-called 'filler' subjects like Life Orientation and Creative Arts. Both the teachers and the HoDs find this disturbing and distracting. They argued that these subjects interfere with the scientific thinking and take too much time to prepare especially because they were not trained to teach them.

The veracity of the teachers and the HoDs' concern about teaching 'filler' subjects should also be understood from the fact that in general South African teachers specialised in two subjects at most. The challenge becomes severe when a teacher who specialised in art-based subject has to teach a theory-based subject.

Although this study revealed that most Physical Science teachers do not have any formal professional training in Physical Science, they consider themselves to have been appointed to teach Physical Science. Therefore, their concentration always focuses on Physical Science only. As a result, going beyond their special subject in terms of subjects they are employed to teach is tormenting. The researcher agrees with Jadama (2014:89) when positing that:

> *The thorough knowledge of the teachers about a particular subject matter enables them to teach it by using different teaching methodologies. When teachers fully understand the subject matter they teach, they will know which pedagogy is best for them to help students learn subject matter.*

The researcher further noted that the subject matter to be taught informs the methods to be used. Therefore, when a teacher lacks the knowledge of a subject matter, he or she becomes equally confused to decide on the most effective method to deliver that subject matter. This creates clear grounds on the part of the teacher to end up using inappropriate methods which are unlikely to be learner-centred.

Theme 6

4.2.6 Learner-centred teaching as an antecedent to quality education

Despite considerable consensus around the basic dimensions of quality education, one of the themes refers to quality education as processes through which trained teachers use child-centred teaching approaches in well-managed classrooms and schools and skilful assessment to facilitate learning and reduce disparities. For this

reason, the researcher maintains that sidestepping learner-centred teaching equates with the spurning of quality education.

The continued incapability to adopt learner-centred teaching by the rural selected schools in this study denies learners opportunities to acquire critical skills that define quality education. In this day and age, teacher-centred approaches no longer prepare learners for the current needs like employment and escape from poverty, especially among the previously disadvantaged communities. Hence, the limited view of teaching as presentation of knowledge no longer fits with current understandings of how and what students learn. Instead, instruction should help learners build on prior knowledge to develop attitudes. An examination-oriented teaching approach does not support quality education. As mentioned by T16, *"subject advisors are only concerned with covering and completing the syllabus and learners' performance on tests and examinations".*

These comments by T15 and T16 prove that departmental officials do not prioritise quality on their school visits, instead they concern themselves with what has been done only and not the how part of it. This also validates other participants' submissions that the entire teaching in schools under the investigation is examination-oriented (see paragraph 4.5.5.1).

The researcher considers this quantifying of education as a feat to appease politicians at the expense of quality dimensions. The researcher further argues that this unnecessary pressure put on schools denies teachers opportunities to focus on new innovations such as learner-centred teaching.

The researcher further reckons that prioritizing examination performance above quality imperatives fails to embrace the ultimate purpose of education. However, examination performance alone does not reflect a host of skills that empowers and prepare learners for life after schooling. This investigation has confirmed that learner-centred teaching is an undisputable antecedent of quality education. And, it is through quality education that skills shortage, unemployment and poverty especially among the previously disadvantaged communities and rural schools can be addressed.

For these reasons, the researcher is adamant that until effective, relevant and appropriate methods of teaching, i.e. learner-centred approaches, are fully embraced and implemented, the quality of education will remain defective.

4.3 CONCLUSION

This chapter presented the findings, the presentation and data analysis of this study. The focus was to investigate the extent to which learner-centred teaching has been adopted in selected rural schools focusing on the teaching of Physical Science. Data was collected through four data collection techniques which were discussed in above sections. Themes that emerged from the findings centred on the challenges that affect the adoption and implementation of a learner-centred approach were presented. The discussion of these themes has been substantiated by quotes gathered from the participants. The themes from the findings have also been interrelated to the existing literature and theoretical framework. Chapter 5 will focus on the summary of findings and the recommendations of the study.

CHAPTER 5
THE SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

In the previous chapter, the findings of this study were discussed where the main objective was to present, discuss and analyse the findings to the extent to which learner-centred teaching approach is understood and implemented in selected rural and under-developed schools. The main purpose of this chapter is to present a summary of the study findings, the recommendations, the conclusions, as well as the areas for further study.

5.2 THE SUMMARY OF FINDINGS

The main purpose of this study was to determine and evaluate whether educators in rural and under-developed schools have managed to apply a learner- centred teaching approach in line with the requirements of the current South African curriculum, particularly in the teaching of Physical Science (Grade 10 to 12). The study also intended to elicit reactions from education providers and administrators to address those challenges stifling the implementation of a learner-centred approach. In order to meet these aims, the following main research question was posed:

- *How do educators in rural and under developed schools cope with a learner- centred teaching approach as part of the curriculum innovation?*

To further clarify the nature of instructional programmes taking place in the selected schools and to determine the underlying factors that might have an impact on the educators' pursuit in adopting and implementing a learner-centred approach, the following sub-questions were asked:

- How does the lack of resources affect the implementation of a learner-centred approach?

- How do the rural and under-developed conditions affect the implementation of learner-centred approach?
- How do educators' prior knowledge and their experiences impede their participation in new curriculum developments?

To find answers to these basic questions, the study was conducted in six rural schools in Dannhauser Circuit, KwaZulu-Natal, South Africa. Data was collected from 18 Physical Science educators, 18 Physical Science learners and six Physical Science (HoDs). The major findings yielded by the empirical research and literature survey in this study can be summarised as follows:

5.2.1 Flimsy understanding of the concept of learner-centred approach

Although learner-centred teaching has been the core element of curriculum approach in South Africa since the adoption of an OBE system, some teachers in rural areas are still floundering in terms of understanding the concept and even the practical imperatives of a learner-centred approach. Teacher participants in this study were unanimously unequivocal in emphasizing that they had very little training or none at all in the learner-centred approach. Document analysis also showed no reference of departmental officials either evaluating or giving any form of support to the teachers with regard to learner-centred strategies. This point was further validated during the focus group discussions and when observing some of the lessons given by Physical Science teachers.

Some teachers who participated in this study could not distinguish between collaboration and cooperation. The two were treated as group work and, worse still, learners were hardly requested to practice them. When teachers cannot distinguish between cooperation and collaboration, it casts some doubt whether they understand what learner-centred teaching entails. This revealed an important need to empower rural school teachers with the knowledge and skills of implementing learner-centred pedagogy.

5.2.2 Inappropriate teacher development programmes

This study has detected that educational innovations in South Africa were not accompanied by appropriate and relevant training of teachers that would have prepared them for the challenges of implementing the new educational demands. During the focus group discussions, the educators confirmed that they had never received proper training of implementing learner-centred teaching. This study has revealed that in the South African context, teacher development interventions are hardly appropriate and are not sustainable.

5.2.3 The effects of environmental factors on the quality of teaching and learning

This study has confirmed that teacher recruitment is more of a challenge in rural areas. This is particularly true in secondary schools where Science/Mathematics recruits are increasingly scarce. Lack of resources on its own poses a challenge to adopt learner-centred teaching. Also, this study confirmed that unsuitable living conditions are a turn-off to most teachers; especially those whose qualifications are sought-after (see section 4.5.3.1).

In addition to inadequate resources needed for the adoption and implementation of learner-centred teaching, suitably qualified teachers, who can at least implement relevant teaching methods acquired from professional training, have shunned rural schools. These factors inhibit rural schools from keeping pace with the sought-after developments like learner-centred teaching. Hence, they are still stuck to a traditional teacher-centred mode of teaching. These factors inhibit rural schools from keeping pace with the current developments. Hence, they are still stuck to a traditional teacher-centred mode of teaching.

Infrastructural challenges like insufficient transport and poor road conditions make access to rural schools difficult. Lack of electricity and information and communication technologies (ICTs) deprive rural schools of taking advantage of modern-day educational resources to enhance their instructional programmes.
The researcher rejects the notion that the difference between rural and urban schools is political. One definite area that confirms inequality relates to resource

materials. It is for this reason that the researcher believes that lack of resources in rural and under-developed schools poses a challenge to adopting learner-centred teaching as the approach is essentially resource-reliant. Hence, inadequate resources in rural schools stifle their attempts to implement learner-centred teaching.

5.2.4 Lack of resources

Schools investigated in this study lack even the basic resources like functional school libraries and laboratories, and learners and teachers do not have access to computers. Without these basic resources, the adoption and implementation of a learner-centred approach will remain unachievable. Lack of educational resource materials does not only account for poor quality of teaching and learning, but also ensures that teachers remain stuck in the traditional teacher-centred methods. Furthermore, it deters quality and experienced teachers who teach scarce subjects, particularly Mathematics and Physical Science, from taking up jobs in those areas.

Education reforms require schools to accommodate new teaching and learning styles, which includes providing laboratory classrooms; flexible instruction areas that can facilitate small-group, large-group, and multi-age instruction; and multimedia centres that offer a variety of technological resources. However, with reference to the schools that form part of this study, this requirement proves to be a grave omission particularly to rural and disadvantaged schools.

Due to apartheid's skewed supply policy, which deprived black rural schools of resources, it would have been logical for the democratic government to have prioritised the needs of those schools that were marginalised by the apartheid government, particularly in terms of resource materials. This omission has without doubt restricted progress in addressing deficits in school facilities.

For this reason, the researcher affirms that the absence of appropriate resource materials in the selected schools inhibits the adoption of learner-centred teaching. Thus, learners from the selected schools are still subjected to the traditional teacher-centred teaching. This denies rural learners opportunities to develop those

skills considered as the embodiment of intellectual growth, which is one of the definitive aims of learning, as well as other important learning skills such as critical thinking, problem solving and the ability to work cooperatively with others.

5.2.5 The negative role of politics in education provision

As pointed out in section 2.4.2, that OBE will not fail because politicians and bureaucrats are misinformed about conditions of South African schooling, but because the policy is driven in the first instance by political imperatives which have little to do with the realities of classroom life. While it was important for the democratic government to move away from the apartheid government, the actual mistake was to prioritise political correctness at the expense of the educational imperatives. Hence, from its inception, educational changes in South Africa were politically biased for purposes of breaking away from apartheid. At the time, political leaders considered it critical that their new found democracy had to be protected. In so doing, sensitive positions in education were given to political loyalists of the ruling party who in most cases were academically not suited for such positions. This led to a situation whereby the political effects superseded academic imperatives.

The largest teachers' union, SADTU, which is aligned to the ruling African National Congress (ANC) party, wields enormous power and influence over the education system. Regrettably, SADTU's grip over education has negatively affected education quality in South Africa. The 'cash for jobs' phrase refers to corruption within SADTU's in the filling of educational posts, which led to many under-qualified individuals appointed to senior positions. The researcher submits that jobs for pals by SADTU has stifled progress and quality in education and consequently relegated South African education to be among the worst education in the world. As a result, the apparent dropping of education quality is partially due to the appointment of under-qualified and unsuitable subject advisors who lack experience and competence in their subjects. Hence, they are in no position to develop teachers in terms of effective and innovative teaching methods.

As mentioned in section 2.4.2, the fact that even the designing of the new South African curriculum lacked academic thinking posed not only implementation challenges, but learning content ones as well. For this reason, the South African

curriculum has been changed three times from 2005. This further posed adaptation challenges not only for the teachers but also for everybody involved in education.

5.2.6 Poor quality of teaching and learning of Physical Science in rural schools

Physical Science, by its very nature, is a practical subject and thus resource reliant. As a norm, the basic resource material for teaching and learning of Physical Science is a fully stocked and functional laboratory. From all selected schools in this study, none has a functional laboratory. Both teachers and learners thus have to theorize, memorise and regurgitate the scientific concepts that ideally have to be demonstrated through experiments and practical work. Therefore, teaching is still traditional and teacher-centred.

While research has revealed that computer mediated learning has become significant in teaching and learning, it has also been confirmed that is has many advantages in the teaching and learning of Physical Science. However, all schools in this study have no access to computer technology.

The unfavourable rural environment has further proved to be less attractive to the teachers, especially experienced and more qualified Physical Science teachers. This leaves rural schools with under-qualified teachers and, at times, Physical Science being taught by teachers not trained in the subject.

5.3 RECOMMENDATIONS

5.3.1 Teacher development

Given the educational innovations in South Africa, coupled with curriculum inconsistency, precise and deliberate teacher development interventions should be carefully designed. The researcher therefore opines that such interventions should be directed towards empowering teachers to grasp the implications and the imperatives brought by the educational innovations. In addition, the volatile curriculum changes that characterised South African education since 1996 should

have been accompanied by corresponding teacher-development programmes. However, the findings of this study revealed that teacher educational programmes focus on uncritical regard for knowledge, and that the level of knowledge provided to teachers in in-service programmes is of questionable standards and does not even touch on teaching approaches such as learner-centred teaching, (see section 4.5.4.2).

The researcher has therefore identified some areas of weakness to be targeted in order to capacitate rural teachers with relevant skills of implementing learner-centred approaches.

5.3.1.1 Critical development areas that should be addressed

In order to empower teachers to sufficiently grasp and be able to implement the learner-centred approach, the researcher recommends that teacher development programmes should target the following:

- **Subject content knowledge**

Limited subject knowledge on the part of the teacher does not only break down the teacher's confidence but further restricts the ability to inspire learners in the subject. Hence, learners' interest in the subject fades away. To address this drawback in rural schools, the Department of Basic Education should organize rigorous upgrading programmes aimed at improving academic qualifications for rural school teachers. This is even vital as this study revealed that most rural Physical Science teachers are under-qualified.

- **Various teaching skills and methodologies**

Rural school teachers should be regularly trained to use various skills to accommodate learner differences and to be able to sustain the demands of learner-centred pedagogy.

- **Fluency in the command of the medium of instruction**

Fluency in the medium of instruction is reciprocal between teachers and learners. Where teachers themselves struggle with the language of instruction, there is little prospect of learners mastering the lexicon and terminology of the subject being taught. Poor literacy level among learners restricts them from learning on their own and discovering knowledge independently as one of the requirements of learner-centred pedagogy. Hence, as this study determined that rural Physical Science teachers are also struggling in terms of using English when teaching, teacher development programmes should include English language proficiency courses as one of its aspects. This can help to improve their language proficiency, which reciprocally can improve learner's literacy such that learners become able to read with understanding without having to start by interpreting into their vernacular.

- **Teacher development workshops**

In addition to the irrelevant types of development programmes provided to the teachers portrayed in this study, another concern was the duration of workshops conducted. The researcher argues that this once in a while, uncoordinated approaches to teacher-professional development are insufficient and inapt in the context of existing educational restructuring efforts. The researcher recommends that development workshops should be on-going.

5.3.1.2 Addressing the quality and quantity of teachers

The researcher acknowledges that many attempts have been made to address these two shortfalls. These include issuing of bursaries to retrain existing teachers and the Fundza Lushaka Bursary Scheme for the initial teacher education training in scarce subjects, particularly Mathematics and Science. Nevertheless, this study revealed that these two challenges still exist, particularly in rural schools.

The researcher believes that one way of addressing these challenges is to establish a credible institution tasked with one main purpose of producing enough quantity of teachers while also addressing the quality needs of the teachers. In addition, the researcher maintains that the closure of the country's teaching colleges during the mid-1990s, following a government decision that university training could provide a better standard of teaching was a misjudgement.

Therefore, the researcher recommends that teacher training colleges should be reopened to address the following educational imperatives:

- Sufficient supply adequately trained teachers;
- Put the real focus of training on pedagogy not just on unstable theories;
- Restore quality of education. The researcher argues that university teacher training programmes lack essential knowledge and skills and therefore cannot produce quality teachers. From personal experience, the researcher is not convinced that universities adequately focus on the actual matter, which is the training of teachers, but more on the knowledge or the theory. Content knowledge alone does not make a good teacher. This should be supplemented with skilful methods of imparting such knowledge. In the context of the study, teacher training programmes should also empower teachers with skills and deftness not only to impart knowledge to learners but to empower learners to discover knowledge on their own.
- The Initial Teacher Education Research Project (2015) disclosed that most supervisors are not subject specialists, and in at least two institutions it is possible for students to pass teaching practice despite performing poorly in a

classroom, or even without being assessed on their classroom expertise. From personal knowledge, the researcher can confirm that in some cases university lecturers themselves are not necessarily trained teachers and their lecturing methods do not model what their student teachers could emulate. Hence, there is no evidence that university trained teachers were practically exposed to learner-centred teaching even during their training. The researcher therefore argues that this lack or low-cut emphasis on the practical part of teacher training by South African universities compromises the quality of their teacher graduates.(Technical Report 2011 to 2015).

- The re-opening of teacher training colleges will also do away with the fast paced 'microwave' systems through which teachers qualifications are by now obtained, for example, the Post Graduate Certificate in Education (PGCE). This qualification is accessible to anyone who has a three year post matric qualification in whatever type of education, once the holder of that qualification undergoes one year of training through correspondence, he/she is accepted as a qualified teacher. The researcher believes that longer sustained and intensive training of teachers is more effective than few hours' workshops that teachers are subjected to.
- To address the prevailing discrepancy supply of teachers in terms of key subjects and teachers for the Foundation Phase, The Teachers in South Africa: Supply and Demand (2013-2025) has revealed that the Foundation Phase (Grade R to 3) graduates supplies are too low for its needs. Noted also, is a significant shortage in key subjects, particularly Mathematics, Mathematical Literacy and languages. This casts some doubts whether universities are capable to address the educational needs of the country. Teacher training colleges before their closure were divided into two types, some focused on training primary school teachers while others focused on producing secondary school teachers.

The researcher's final submission is that, given the fact that the current attempts at addressing teacher development and production do not yield the desired results, the re-opening of teacher training colleges can go a very long way towards producing an adequate number of teachers and also improve their quality in terms of teaching

strategies. The main function of teacher training colleges is to train teachers. These institutions therefore have the time, mandate and ability to structure their curricula to cater for all required skills that prepare and empower teachers to be effective and relevant in implementing operative teaching methods in line with current innovations.

5.3.1.3 Capacity building

As mentioned in section 5.2.5, two factors are largely responsible for the shortcomings of the schooling system. The primary cause is weak capacity throughout the civil service (teachers, principals and system level officials) which results not only in poor schooling outcomes, but also breeds inability to adopt and implement educational innovations.

In the literature review, section 2.5.3**,** an unfortunate discrepancy between the capacity of the civil servants and the high spending of funds by the government was identified. This clearly means that the financial input by the government does not translate favourably into the desired quality of education.

This high financial spending without corresponding output, according to the researcher, is partly as a result of inappropriate planning in terms of auditing relevant skills and incapacity to manage available resources on the part of the government officials. This unfortunately constitutes a wasteful exercise. A typical example of this assertion can be seen by comparing South Africa and Zimbabwe. In terms of wealth, South Africa is probably one among the wealthiest African countries, whereas Zimbabwe is probably the poorest. However, in terms of quality education, the World Economic Forum (2014) ranked South Africa as number 146 as against Zimbabwe at 42. This proves that South Africa's financial strength does not translate into her quality of education.

Therefore, the researcher recommends that for South Africa to reap the benefits of its financial investment, the country should improve the capacity of her teachers, education managers as well as all departmental officials by considering the following:

- The minimum formal qualifications for teachers should be a mandatory four year course. Unlike the current position whereby the minimum qualification is the Relative Education Qualification Value (REQV) 13 which means matric plus a three year teaching qualification, a minimum qualification should be elevated to an REQV 14 which is a junior degree plus a teaching qualification. At times this REQV 13 qualification even allows a teacher to hold a senior position in education. This leads to a situation whereby a sensitive position which requires critical leadership skills being given to under-qualified and undeserving individuals. A cue to the importance of a longer period of training should be taken from Finland. The entry requirement for permanent employment as a teacher in all Finnish basic and high schools today is a Master's Degree.
- When it comes to development workshops, the ' microwave' training of teachers through one day workshops should be annulled. Evidently, the short courses have proved to be of insignificant impact. Rather, in-service training should be over longer periods.

The researcher also views such shorter courses as inadequate to address teachers' needs and, holds the view that effective professional learning opportunities should:

- Be intensive, on-going, and connected to practice;
- Focus on student learning and address the teaching of specific curriculum content;
- Be aligned to school improvement priorities and goals; and
- Build strong working relationships among teachers.

To address this deficiency, the researcher recommends that:

- The duration of the period for in-service training for educators should be prolonged. One consideration could be to use the vacations. However, some form of incentives should be considered bearing in mind that affected teachers will have to sacrifice their holidays;
- The main criteria for the selection of workshop facilitators should be based on the academic expertise and experience of the facilitators; and
- The inclusion of union representatives, which in most cases is informed by political undertones, should be rejected. The Teacher Union Collaboration (TUC) workshops should be rescinded. The researcher views these workshops as a political ploy by the department to buy unions' support. The funds that the Department of Basic Education allocates to unions to conduct these workshops could be better utilized by hiring experts to empower teachers on important aspects of the curriculum. Regrettably, unions do not use those funds entirely to workshop teachers. Part of those allocations end up not being accounted for. Some smokescreen workshops conducted by unions are badly organised and poorly attended**.**

The researcher's argument is that for a country to be able to implement its educational policy innovations, it has to capacitate its workforce, particularly the teachers who are actually the vanguards in the education fraternity.

It is for such reasons that the researcher maintains that failure to prioritise teacher-development in terms of relevant skills to enhance quality education can easily hinder any other attempts to address educational challenges.

5.3.1.4 Provision of 21st century skills and competencies

The researcher argues that the basic skills that defined the teaching profession are lagging behind and can no longer prepare learners for the 21st century. The challenges have gone beyond the content knowledge. Hence, teachers should be

trained and empowered with high quality alternative routes to teaching so as to be able to effectively interpret assessment results, respond to learners' learning needs, and cultivate a passion for learning that will support students for a lifetime. They should go beyond imparting subject content knowledge and cause learners to master 21st century skills such as critical thinking, problem-solving, digital communication, collaboration and creativity as well as innovation. It is for this reason that the researcher stresses the importance for all teachers, particularly those in rural areas, to master the application of technology to support more robust instructional learner-centred methods and to understand the relationship between content, pedagogy and technology. Given the quality of teaching and learning observed in all the schools under this investigation, the researcher recommends that: in line with section 29(1) (a) of South African Constitution which guarantees free basic education for disadvantaged learners first, before it is extended to more privileged groups, priority should be given to rural schools in order to realise the South African dream of equal education and empowerment.

5.3.1.5 Stabilization of curriculum volatility

One of the gross omissions done by the curriculum planners in South Africa was their inability to capture the potential and the practicability of implementing the innovations prescribed by the politicians, in particular the readiness of human resources and the availability of material resources required to implement a learner-centred pedagogy. For this reason, the researcher proposes that a complete restructuring of the education system is essential to support the innovations.

From the very beginning, educational changes in South Africa were not based on education imperatives but on political intentions. Since politicians and bureaucrats are not well versed about what schooling entails, their inputs should have not superseded those of educationists (see section 2.4.2). This is because education is a highly specialised field which can never be successfully served by political appointees alone. The researcher adds that politicians' priorities cannot always be the same as those of an educationist.

The researcher recommends that by reducing political meddling in educational affairs, South Africans can go a long way in terms of stabilizing curriculum volatility. In so doing, all stakeholders should be involved; for example, the academics, teachers and representatives from the general public should collaboratively decide the actual needs, resources and capabilities that will inform the type of curriculum which can be sustainable while being effective towards the attainment the educational needs of South Africa.

To sustain curricular innovation and appropriate teacher development support requires resources and relevant policies to be provided so that the relevance of curriculum adjustments become logically and substantively determined.

5.3.2 Addressing environmental and local challenges

While the researcher concurs with the educational benefits of a learner-centred education, believes that different environments and backgrounds cannot respond similarly to the same educational approach. Each and every environment has its unique realities which cannot be accommodative to the innovations in exactly the same way as other environments. The contexts from which educational innovations in democratic South Africa had to begin were vastly unequal due to the apartheid screwed policy of supply. The rural predominantly black environment was characterised by poverty, under-development and poorly resourced communities, while the urban and predominantly white environments were developed and better resourced. For this reason, the researcher believes the government should have started by levelling the grounds in improving facilities and resources in rural schools before introducing a resource-dependent curriculum. Therefore, the researcher recommends that the Department of Basic Education has to go back to the drawing board and follow a relatively systematic approach in terms of balancing resources between rural and urban former Model C schools.

5.3.2.1 Equitable budget allocation and management of funds

The researcher maintains that a deliberate and precise intercession is missing to ensure that returns for such investments are earned in terms of skills and perceived quality of education. The researcher relates this incapacity to the following:

Cadre deployment: This practice is alluded to in section 4.5.4.3 when Zengele and Coetzer (2014) point out that there are several inadequately qualified and less-experienced persons occupying senior positions within the bureaucratic structure of the DoE. The present ANC government has ignored the appointment of suitably qualified and skilful persons to hold sensitive positions in favour of party loyalists who are not capable of handling and appropriating an education budget for the worthy and predominant needs of education. This is further characterised by poor planning which is explained by the failure of the provincial departments to utilize all funds allocated to them. Therefore, the researcher maintains that appointment of departmental officials should be based on qualifications, experience and integrity.

South African Schools Act of 1996: SASA This Act brought with it an ambitious policy of granting governing bodies powers to manage school finances. However, this act does not set minimum educational qualifications for being an SGB member. This has led to a situation whereby illiterate parents become burdened with a challenging task of managing finances. This arrangement allows some principals and service providers to abuse school allocations to their benefit. The researcher views this as an act of being politically correct rather than promoting education. Hence, the researcher recommends that this Act should be amended such that minimum educational qualifications for SGB members should be set. And, the Department of Basic Education should be responsible for the appointment and remuneration of SGB members.

5.3.3 Improving teachers' working conditions

The researcher maintains that it takes direct experience to understand the vastness and varied conditions under which South African teachers work. These range from incoherent and unsustainable polices, environmental conditions, lack of support from other stakeholders, inconsistent supply of resources and many situational challenges like dealing with a volatile curriculum, reconciling political influence with educational imperatives and dealing with learners' indiscipline.

5.3.3.1 Unworkable policies

Most departmental policies are not able to cater for the individual schools' circumstances. One such policy is the Post Provisioning Method (PPM). In terms of this policy, the number of teaching posts in each school is mainly determined by the number of learners and the types of subjects the school offers. A common scenario is whereby a secondary school with an enrolment of 100 learners qualifies for a maximum of three teachers including a promotional post. Such a school will effectively have one principal, no deputy principal and no head of department. In a ratio of 1:40, all seven subjects irrespective of the number of grades should be divided among the three teachers available. Since schools with smaller enrolments have to offer an equal number of subjects as prescribed by the national curricular needs, the problems of work overload arise and teachers becoming forced to take subjects that they are not qualified to teach. To counter this, the researcher recommends that the need for teachers in each school should be determined by the type of subject streams offered first before the number of learners is considered. This will cater for both specialization and effectively reduce workload for teachers.

5.3.3.2 Improving teachers' salaries

Despite the fact that over 90% of education budget in South Africa goes to the teachers' salaries, teachers are still not satisfied with their salaries. The researcher believes that this does not only affect teachers' morale, but also their courage and determination to confront challenges associated with their work.

The researcher believes that South African teachers' salaries are based on vague imperatives like the teachers' experience, qualifications up to relevant qualification value 14 (RQV) or M+4 and post level. However, these factors do not consider the different conditions under which they work, the workload and the level of challenges they have to deal with. The researcher further argues that work-related challenges differ in terms of urban, township and rural environments. The researcher is concerned that teachers in many rural schools work under difficult conditions in comparison to their counterparts in the more affluent areas. Also, primary school teachers cannot be said to have similar workloads and related challenges to secondary school teachers. These differences should be considered when salaries are structured such that the workload, challenges and skills required by secondary school teachers are recognized.

- The lack of tangible salary adjustments for improved academic qualifications according to the researcher is also ill-conceived. Since this discourages teachers to improve their qualification, it also means teachers are not encouraged to improve their skills and knowledge; and
- Dissatisfaction with salaries focused on discrepancies between neonates and experienced teachers; subordinates earning higher salaries than their superiors; and freezing of capped leave. To address the challenges of teachers' work engagement the researcher recommends that teachers' salaries should be restructured such that they reflect the significance, vastness and challenges they face in their careers.

The researcher contemplates that in structuring teachers' remuneration, the various combinations of duties performed by teachers should be reflected in their salaries. However, it appears the government fails to understand the actual value of this profession when it comes to salaries. This is not only demoralising to the teachers, but further made teachers themselves to doubt their prominence. To revive the status and the actual value of the teaching profession, the government should not only improve the conditions under which teachers are working, but also improve their salaries.

5.3.3.3 Resolving the issue of long distances

The advent of democracy in South Africa led to a huge migration of many affording and middle class professionals to urban areas. Most of those were teachers in pursuit of better living conditions. As this study confirmed, most teachers in rural areas reside in townships and suburban areas. Thus, they have to commute on a daily basis. This puts a strain on them in terms of transport costs made worse by the poor road conditions in rural areas. To address this challenge, the Department of Basic Education should provide decent accommodation and other facilities that will ameliorate the rural living conditions or subsidize the transport costs incurred by those who will prefer to stay in their homes. By providing decent accommodation for teachers in rural schools to save them from daily travelling plus monetary incentives at least for scarce subjects like Physical Science and Mathematics, better qualified and experienced teachers can be lured to work in rural schools. In this way, the teaching and learning of Physical Science in rural schools can improve.

5.3.3.4 Recruiting and retaining scarce subject teachers

To attract scarce subject teachers like those for Physical Science, the Department of Basic Education should, over and above their basic salaries, pay them rural and/or scarce skills allowances. However, the researcher is adamant that finding employment for the spouses of such teachers would be a very attractive incentive.

The researcher therefore resolved that scarce skills incentives in rural areas should be implemented so as to secure retain and motivate relevant and experienced teachers.

5.3.3.5 Performance recognition

To further motivate rural teachers, monetary recognition of excellent work should be implemented. This could encourage a healthy competition among teachers, in the process encouraging dedication to excel in the profession. This could certainly inspire teachers to work even under a hostile environment when they know that their efforts are approved. The researcher considers that competition for excellence recognition will apparently mean that teachers tirelessly seek to identify and

implement most effective teaching methods. Thus, learner-centred methods will be ultimately mastered, developed and implemented.

5.3.4 Eradication of corruption

The researcher identified two forms of corruption that strangle educational development in South Africa. Sadly, these happen despite the availability of measures meant to curb corruption in the education sector. These are as follows:

5.3.4.1 The selling of senior posts within the education sector

These findings of this study confirm that positions of influence in education are held by undeserving personnel who are not capable to put up with the demands of the paradigm shift. To curb this rot, the researcher recommends that:

- The South African Schools Act 84 of 1996 should be strictly applied. This Act does not make any formal provision for teacher union representation at school level during the filling of promotional posts. Hence, it makes the active participation of unions, who should merely act as observers, unconstitutional.
- The DoE should outsource the selection process to an employment agency with personnel trained in human relations to manage the filling of promotional posts in schools and at the district offices. The researcher hopes this could ensure impartiality which could assist the Department of Basic Education to appoint deserving and competent personnel.

The researcher believes that it cannot be easy for the ruling party to do away with a culture of patronage that has permeated almost all areas of the civil service as this can alienate their alliance partners, particularly SADTU. The researcher further contemplates that in order to disentangle this vice, the following measures should be implemented:

- The powers held by teachers' unions in education matters should be dismantled;
- Teachers' unions should not be formally aligned to political parties;
- The main prerequisites for promotion should be based on relevant skills, experience and merit;
- Interview processes should be conducted by neutral hired private companies; and
- The researcher believes party politics should not be endorsed as the policies of the state but instead those of the government which caters not only for narrow party politics but also those of the country. Also, formal alliance between teacher unions and political parties should be declared illegal.

5.3.4.2 Misappropriation and the embezzlement of school funds

Due to this nature of corruption, funds that are meant to acquire educational resources needed for the implementation of learner-centred teaching disappear through maladministration.

The researcher therefore recommends that:

- stringent policies to deal with corruption should be formulated and strictly implemented.
- financial literacy, for SGB members in particular, should be provided. since no educational qualifications should be met for being an SGB member, most SGB members in rural schools are semi-literate if not illiterate. This makes them incompetent when it comes to making school budgets and managing the school finances. This also creates opportunities for some principals to misuse school finances. Hence, the researcher believes that appropriate interventions aimed at empowering SGB members in financial literacy and management should be done.

5.3.5 Resource materials as the basis of learner-centred teaching

This study, through the literature review, focus groups interviews, observations and individual interviews, established that the most daunting challenge faced by rural schools is the gross shortage of resources. Hence, the researcher, informed by the investigations conducted for this study, is also convinced that failure to adopt and implement learner-centred teaching is largely informed by the blatant lack of resources. The most glaring barriers caused by the lack of resources in teaching and learning are that they stifle the adoption and implementation of learner-centred teaching.

The researcher therefore recommends that school allocation of funds should be determined by the individual needs of the school. The allocations should consider the actual basic needs of the school that will enable the school to operate effectively. Such allocations should ensure that all learners in that particular school at least have textbooks, and that there is sufficient stationery and classroom furniture.

Another challenge that distorts the no-fee policy is the inability of the Department of Basic Education to correctly categorize schools in terms of quintiles. An obvious distortion is that schools from the same area with similar challenges as the very same schools where this investigation took place are not placed in the same quintiles. This is despite the fact that learners attending these schools come from the same environment and some from the same parents.

To correctly determine school quintiles, the researcher believes that local authorities like municipalities and headmen who understand the local dynamics should be roped in when determining the poverty levels of their respective communities. This could cover up the apparent incapacity of schools to provide accurate information regarding the poverty levels of their respective communities.

5.4 CONCLUSION

This chapter summarised the findings of the study and suggested the recommendations to address the challenges of learner-centred learning in rural education. Since there are many identified challenges that stifle the implantation of

educational innovations, particularly the adoption and implementation of a learner-centred approach, the proposed recommendations were unavoidably stretched to address most quality-sensitive issues the researcher deemed to be responsible for the quality insolvency in rural schools. However, the researcher acknowledges that more research is still needed to investigate educational inequalities among racial groups, social classes and the impact of environment in South African education. What the researcher found more distressing is the continued diminishing of education quality in South Africa.

This is despite the fact that South Africa is considered as one of the wealthiest countries in Africa. Hence, more research is critical to identify the actual reasons that are eroding the quality of education such that poor African economies are doing far better than South Africa.

The researcher believes that this study could assist in addressing the challenges of education provision particularly in rural schools. Moreover, it could reveal the challenges that stifle the adoption and implementation of educational innovations. Additionally, this study can help to explain the negative role politics can play to stifle educational developments.

5.5 LIMITATIONS OF THE STUDY

While this study added to the sparse literature about the problem of teaching Physical Science in Grade 10-12 (three grades only) at Dannhauser Circuit in KwaZulu-Natal Province in South Africa, it was nevertheless not without limitations. The unique context of only six South African secondary schools in one circuit (Dannhauser) and the sample which was limited to a few grades (grades 10 to12 only) reduce the generalizability of the findings. Moreover, because of the purposive sampling of learners, teachers and HoDs, the findings could have largely represented the perspectives of more individuals (like principals and subject advisors) who may have had overly contrasting experiences.

Inferences drawn from the self-selected sample, based on a few grades only, from a few HoDs', teachers' and learners' perspectives are by nature limited in scope. Therefore, future studies could continue to explore other phenomena of the

teaching of Physical Science (like teacher qualifications in the teaching of Physical Science) or in other subjects in other schools and could also capture the experiences of all those who engage in it in different contexts and with different constituents.

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APPENDICES APPENDIX A:
FOCUS GROUP SCHEDULE: DISCUSSION SCHEDULE FOR EDUCATORS

Welcome:

Welcoming and thanking participants for volunteering to participate in the focus group discussion.
Remind participants of the importance of their view points.
Appreciate for sacrificing their time for the study.
Introduction
Explaining the purpose of focus group discussion:

To assess your views, experiences, abilities and challenges in using learner-centred teaching as part of curriculum developments.
Anonymity

I will let the group know that their views will be taped but also assure them that the discussion will remain anonymous.
Tapes will be kept safely in a locked facility until they are transcribed word for word. Thereafter they will be destroyed.
The transcribed notes will contain no information that would allow individuals participants to be linked to specific statements.
Participants should answer and comment as accurately and truthfully as possible.
Participants should refrain from discussing comments of other group members outside of the focus group.
Participants will be informed that they are free not to comment or participate on issues where they do not want to.
Ground rules

Only one person to speak at a time.
There are no wrong or right answers

They do not have to speak in any particular order.

No need to agree with the views of other group members.
Ask if there any questions or comments before we begin.
Warm up
First, let everyone introduce himself/herself.
I will explain that I am going to allow a couple of minutes to think about every question that I will ask.
Preparing to start the session

For ethical reasons participants will be asked to sign a Participation Consent Form, containing the following sections:
I have been given an explanation of the nature and purpose of the study.

I understand what I will need to do to take part and my questions have been answered satisfactorily.
I have the contact details for the staff involved.

I understand that I may withdraw myself and my data at any time, without consequences.
I am satisfied with the arrangements to ensure that it will not be possible for me to be identified when the results are made available.
I will go through this information with each participant and ask them to sign the form.
I will check that there are no objections to the use of the audio recorder; then switch it on.
Questions

Do you think a learner-centred approach can help to improve the quality of teaching

Physical Science, why and how?

Between a teacher-centred approach and a learner-centred approach, which one do you feel more comfortable to use, and why?

How, if you do, allow your learners to suggest how, what and when do they want to be taught?

What type of training have you received in the learner-centred approach?

Which problems if any, do you encounter in using learner-centred teaching?

Do you feel the level of training, support and assistance you have so far received has sufficiently prepared you to effectively implement a learner-centred teaching, and why?

Mention between 3 to 5 resource materials you consider as basic for you to implement the learner-centred approach and how each can contribute.

Which among the following resources is accessible in your schools, and how do you use them in your teaching?

School laboratory

School library

Internet

Do you think the teaching and learning of Physical Science in your schools is below than what affluent schools administer? Why?

APPENDIX B

FOCUS GROUP SCHEDULE: DISCUSSION SCHEDULE FOR LEARNERS

Welcome:

Welcoming and thanking participants for volunteering to participate in the focus group discussion.
Remind participants of the importance of their view points.
Appreciate for sacrificing their time for the study.
Introduction
Explaining the purpose of focus group discussion:

To assess your views, experiences, abilities and challenges in using learner-centred teaching as part of curriculum developments.
Anonymity

I will let the group know that their views will be taped but also assure them that the discussion will remain anonymous.
Tapes will be kept safely in a locked facility until they are transcribed word for word. Thereafter they will be destroyed.
The transcribed notes will contain no information that would allow individuals participants to be linked to specific statements.
Participants should answer and comment as accurately and truthfully as possible.
Participants should refrain from discussing comments of other group members outside of the focus group.
Participants will be informed that they are free not to comment or participate on issues where they do not want to.
Ground rules

Only one person to speak at a time.
There are no wrong or right answers.
They do not have to speak in any particular order.

No need to agree with the views of other group members.

Ask if there any questions or comments before we begin.

Warm up

First, let everyone introduce himself/herself.

I will explain that I am going to allow a couple of minutes to think about every question that I will ask.

Preparing to start the session

For ethical reasons participants will be asked to sign a Participation Consent Form, containing the following sections:

I have been given an explanation of the nature and purpose of the study.

I understand what I will need to do to take part and my questions have been answered satisfactorily.

I have the contact details for the staff involved.

I understand that I may withdraw myself and my data at any time without consequences.

I am satisfied with the arrangements to ensure that it will not be possible for me to be identified when the results are made available.

I will go through this information with each participant and ask them to sign the form.

I will check that there are no objections to the use of the audio recorder and then switch it on.

Questions

- What make you more comfortable between being told everything by your teachers or being encouraged to find information on your own? And why is that?
- What resources do you have in assisting you to learn or find information without the teacher telling you everything?
- How often and for which learning activities do you find the following resources more relevant and helpful?

School library

Laboratory

Computer related technology

- How do you go about completing tasks, homework, assignments and science projects given to you by your teachers?
- Do you find it helpful to do practical investigations without the teachers' supervision? If so, how?
- Do you like doing experiments? If so, what do you like about it? Is it the explosion or the knowledge gained or the method or any other thing that provokes your interest in doing experiments?

Conclusion

Thank you for participating in this discussion.

I hope you have found the discussion interesting. However, if there is anything you are unhappy with, or you want to complain about, feel free to raise it either with me or my promoter DR Segoe at :+27 82 845 4887 / +27 12 429 4649 / 0866 42 1617 or segoeba@unisa.ac.za

Finally, be reminded that any comments featuring in this report will be anonymous.

APPENDIX C

LESSON OBSERVATION TOOL

Grade:---------- Subject:----------

Topic/ theme:	
Venue compliance:	
No of learners:	
Objectives:	

	Teacher's role	**Learner's role**	**Resources applicable**
Introduction:			
Skills to be learnt			
Matter			
Activities			
Verification			

Learner-centred approach(es) applied

Learners' independent activities:	Resources needed:	Skills to be acquired:
Collaborative learning: **Problem-based or inquiry learning:**		
Experiential learning:		
Participative learning:		
Cooperative learning:		
Any :		

Comments

APPENDIX D

INTERVIEW QUESTIONS FOR THE HODs

- To what extent do you believe Physical Science teachers under your department have adapted to learner-centred teaching?
- Which challenges and factors do teachers in your department face in their teaching of Physical Sciences?
- Do you believe the environment in which the school is located has any bearing on the quality of the teaching of Physical Science? If so, what impact?
- Can you confirm that your school is able to recruit and maintain adequately trained and experienced Physical Sciences teachers? If yes, how? And if not, why not?
- Given the intermittent curriculum reviews since the introduction of OBE, what types of teacher development or training have Physical Science teachers receive to prepare in accordance with curriculum demands?
- Common among all curriculum reviews is their reliance to resources, does your school has adequate resources for the implementation of learner-centred teaching?, mention some of them and do they help to promote learner-centred teaching

APPENDIX E

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT YOUR CIRCUIT

P. O.BOX 10238

NEWCASTLE

2940

6 NOVEMBERN2014

THE CIRCUIT MANAGER
BUFALLO FLATS
DANNHAUSE CMC

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN SIX SCHOOLS IN YOUR WARD

I hereby request your permission to conduct a research in at least six secondary schools in your circuit.

The title of my DEd thesis is: The Evaluation of Learner-centred Teaching as part of Curriculum Delivery in under-resourced Dannhauser Secondary Schools.

The study intends to establish the extent to which educational innovations have been adopted in rural and under resourced schools. It also attempts to establish the impact of the constant curriculum changes in strengthening instructional programmes and quality teaching in rural schools.

To a limited extent, the study further investigates the challenges faced by rural teachers to attest whether rural environmental dynamics can be deemed non-compliant with the learner-centred approach.

The study findings will be shared by various stakeholders including policy makers, curriculum planners and education providers. It will also benefit educators in rural

schools by informing them of the alternative approaches possible in their environments.

In conducting this study, my promoter is Doctor B.A. Segoe in the Department of Curriculum and Instructional Studies towards a D Ed at the University of South Africa.

Your kind consideration will be highly appreciated

Manqele C.M

APPENDIX F
A LETTER TO SCHOOL PRINCIPALS REQUESTING PERMISSION TO CONDUCT RESEARCH IN THEIR SCHOOLS

P. O.BOX 10238

NEWCASTLE

2940

6 NOVEMBER 2014

DEAR PRINCIPAL

RE: A REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN YOUR SCHOOL

I hereby request your permission to conduct a research in your school.

The title of my DEd thesis is: An Evaluation of Learner-centred Teaching as part of

Curriculum Delivery in under-resourced Dannhauser Secondary Schools.

The study intends to establish the extent to which educational innovations have been adopted in rural and under resourced schools. It also attempts to establish the impact of the constant curriculum changes in strengthening instructional programmes and quality teaching in rural schools.

To a limited extent, the study further investigates the challenges faced by rural teachers to attest whether rural environmental dynamics can be deemed non-compliant with the learner-centred approach.

My target participants are all Physical Sciences educators in the FET phase (grades10 to 12)

The study findings will be shared by various stakeholders including policy makers, curriculum planners and education providers. It will also benefit educators in rural schools by informing them of the alternative approaches possible in their environments.

In conducting this study, my promoter is Doctor B.A. Segoe in the Department of Curriculum and Instructional Studies towards a D Ed at the University of South Africa.

Your kind consideration will be highly appreciated

Manqele C.M.

APPENDIX G

A LETTER REQUESTING PARENTAL CONSENT FOR PARTICIPATION OF MINORS IN A RESEARCH PROJECT

Dear Parent

Your child is invited to participate in a study entitled: An Evaluation of Learner-centred Teaching as part of Curriculum Delivery in under-resourced Dannhauser Secondary Schools. I am undertaking this study as part of my doctoral research at the University of South Africa. The purpose of the study is to establish the extent to which educational innovations have been adopted in rural and under resourced schools. It also attempts to establish the impact of the constant curriculum changes in strengthening instructional programmes and quality teaching in rural schools.

To a limited extent, the study further investigates the challenges faced by rural teachers to attest whether rural environmental dynamics can be deemed non-compliant with the learner-centred approach and the possible benefits of the study are to benefit educators in rural schools by informing them of the alternative approaches possible in their environments. I am asking permission to include your child in this study because my target participants are those learners who are doing Physical Sciences in the FET phase. I expect to have 35 other children participating in the study.

If you allow your child to participate, I shall request him/her to:

Take part in a group interview

I will observe your child when she/he is being taught in class.

To evaluate whether your child is able to cooperate with others when solving problems.

To observe whether your child is able to find information on his/her own or to answer simple questions that will determine the level of his/her understanding.

Any information that is obtained in connection with this study and can be identified with your child will remain confidential and will only be disclosed with your permission. His or her responses will not be linked to his or her name or your name or the school's name in any written or verbal report based on this study. Such a report will be used for research purposes only.

There are no foreseeable risks to your child by participating in the study. Your child will receive no direct benefit from participating in the study; however, the possible benefits to education are to establish the challenges of implementing learner-centred teaching as part of the educational innovations. Neither your child nor you will receive any type of payment for participating in this study.

Your child's participation in this study is voluntary. Your child may decline to participate or to withdraw from participation at any time. Withdrawal or refusal to participate will not affect him/her in any way. Similarly you can agree to allow your child to be in the study now and change your mind later without any penalty.

The study will take place during regular classroom activities with the prior approval of the school and your child's teacher. However, if you do not want your child to participate, an alternative activity will be available.

In addition to your permission, your child must agree to participate in the study and you and your child will also be asked to sign the assent form which accompanies this letter. If your child does not wish to participate in the study, he or she will not be included and there will be no penalty. The information gathered from the study and your child's participation in the study will be stored securely on a password locked computer in my locked office for five years after the study. Thereafter, records will be erased.

If you have questions about this study please ask me or my study supervisor, Dr Segoe B A., Department of Curriculum and Instructional Studies, College of Education, University of South Africa. My contact number is 0728601200 and my e-

mail is mandlamanq@vodamail.co.za. The e-mail of my supervisor is segoeba@unisa.ac.za. Permission for the study has already been given by Research and the Ethics Committee of the College of Education, UNISA.

You are making a decision about allowing your child to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. You may keep a copy of this letter.

Name of child: ……

Sincerely:
Manqele C.M.

Parent/guardian's name (print) ……
Parent/guardian's signature: ……..
Date: ……..
Researcher's name (print) …….
Researcher's signature …….
Date: …….

APPENDIX H

A LETTER REQUESTING PARENTAL CONSENT FOR PARTICIPATION OF MINORS IN A RESEARCH PROJECT

Dear Parent

Your child is invited to participate in a study entitled: **An Evaluation of Learner-Centred Teaching as part of Curriculum Delivery in Under-Resourced Dannhauser Secondary Schools** . I am undertaking this study as part of my doctoral research at the University of South Africa. The purpose of the study is to establish the extent to which educational innovations have been adopted in rural and under resourced schools. It also attempts to establish the impact of the constant curriculum changes in strengthening instructional programmes and quality teaching in rural schools.

To a limited extent, the study further investigates the challenges faced by rural teachers to attest whether rural environmental dynamics can be deemed non-compliant to Learner-Centred approach and the possible benefits of the study are to benefit educators in rural schools by informing them of the alternative approaches possible in their environments. I am asking permission to include your child in this study because my target participants are those learners who are doing Physical sciences in the FET phase. I expect to have35 other children participating in the study.

If you allow your child to participate, I shall request him/her to:

- Take part in a group interview
- I will observe your child when she/he is being taught in class.
- To evaluate whether your child is able to cooperate with others when solving problems.
- To observe whether your child is able to find information on his/her own or to answer simple question that will determine the level of his/her understanding.

,

Any information that is obtained in connection with this study and can be identified with your child will remain confidential and will only be disclosed with your permission. His or her responses will not be linked to his or her name or your name or the school's name in any written or verbal report based on this study. Such a report will be used for research purposes only.

There are no foreseeable risks to your child by participating in the study. Your child will receive no direct benefit from participating in the study; however, the possible benefits to education are to establish the challenges of implementing a learner- The Reshaping of the World: Consequences for Society, Politics and Business".centred teaching as part of the educational innovations. Neither your child nor you will receive any type of payment for participating in this study.

Your child's participation in this study is voluntary. Your child may decline to participate or to withdraw from participation at any time. Withdrawal or refusal to participate will not affect him/her in any way. Similarly you can agree to allow your child to be in the study now and change your mind later without any penalty.

The study will take place during regular classroom activities with the prior approval of the school and your child's teacher. However, if you do not want your child to participate, an alternative activity will be available.

In addition to your permission, your child must agree to participate in the study and you and your child will also be asked to sign the assent form which accompanies this letter. If your child does not wish to participate in the study, he or she will not be included and there will be no penalty. The information gathered from the study and your child's participation in the study will be stored securely on a password locked computer in my locked office for five years after the study. Thereafter, records will be erased.

If you have questions about this study please ask me or my study supervisor, Dr Segoe B A., Department of Curriculum and Instructional Studies, College of

Education, University of South Africa. My contact number is 0728601200 and my e-mail is mandlamanq@vodamail.co.za. The e-mail of my supervisor is segoeba@unisa.ac.za. Permission for the study has already been given by Research and the Ethics Committee of the College of Education, UNISA.

You are making a decision about allowing your child to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. You may keep a copy of this letter.

Name of child: ----------

Sincerely: Manqele C.M.

_____	_____
Parent/guardian's name (print)	Parent/guardian's signature:
Date:	
_____	_____
Researcher's name (print)	Researcher's signature
Date:	

APPENDIX I
WRITTEN ASSENT

I have read this letter which asks me to be part of a study at my school. I have understood the information about my study and I know what I will be asked to do. I am willing to be in the study.

Learner's name (print) Learner's signature Date:

Witness's name (print) Witness's signature Date:

(The witness is over 18 years old and present when signed.)

_____ _____

Parent/guardian's name (print) Parent/guardian's signature:

Date:

_____ _____

Researcher's name (print) Researcher's signature

Date:

APPENDIX J
A LETTER REQUESTING EDUCATORS TO PARTICIPATE IN A FOCUS GROUP DISCUSSION

Dear ……

This letter is an invitation to consider participating in a study I, Manqele C.M., am conducting as part of my research as a doctoral student entitled An Evaluation of Learner-centred Teaching as part of Curriculum Delivery in under-resourced Dannhauser Secondary Schools at the University of South Africa. Permission for the study has been given by Department of Basic Education and the Ethics Committee of the College of Education, UNISA. I have purposefully identified you as a possible participant because of your valuable experience and expertise related to my research topic.

I would like to provide you with more information about this project and what your involvement would entail if you should agree to take part. The importance of teaching methodology in education is substantial and well documented. In this interview I would like to have your views and opinions on this topic. This information can be used to improve teaching practice so as to improve the quality of teaching and learning particularly in rural and under developed schools.

Your participation in this study is voluntary. It will involve an interview of approximately 60 minutes in length to take place in a mutually agreed upon location at a time convenient to you. You may decline to answer any of the interview questions if you so wish. Furthermore, you may decide to withdraw from this study at any time without any negative consequences.

With your kind permission, the interview will be audio-recorded to facilitate collection of accurate information and later transcribed for analysis. Shortly after the transcription has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or to clarify

any points. All information you provide is considered completely confidential. Your name will not appear in any publication resulting from this study and any identifying information will be omitted from the report. However, with your permission, anonymous quotations may be used. Data collected during this study will be retained on a password protected computer for 12 months in my locked office. There are no known or anticipated risks to you as a participant in this study.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me at 0728601200 or by e-mail at mandlamanq@vodamail.co.za.

I look forward to speaking with you very much and thank you in advance for your assistance in this project. If you accept my invitation to participate, I will request you to sign the consent form which follows the next page.

Yours sincerely
Manqele C.M.

APPENDIX K
CONSENT FORM

I have read the information presented in the information letter about the study in education. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and add any additional details I wanted. I am aware that I have the option of allowing my interview to be audio recorded to ensure an accurate recording of my responses. I am also aware that excerpts from the interview may be included in publications to come from this research, with the understanding that the quotations will be anonymous. I was informed that I may withdraw my consent at any time without penalty by advising the researcher. With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

Participant's Name:

Participant's Signature:

Researcher's Name: Manqele C.M.
Researcher's Signature: ……

Date: ……

APPENDIX L

KZN FUNCTIONALITY FORM

education
Department:
Education
PROVINCE OF KWAZULU-NATAL

_____DISTRICT

SCHOOL FUNCTIONALITY MONITORING: B1 - 2016

DATE OF VISIT: ____ January 2016

(Guide time for the completion of this form: 45 – 60 minutes)

1. CORE DATA

NAME OF SCHOOL	EMIS	TYPE: Prim / Sec / Combined / ELSEN IF PRIMARY, IS GRADE R ON SITE? Yes / No	
CIRCUIT MANAGEMENT	CIRCUIT	SCHOOL TIMES Start : Finish :	GRADES From: To:

STATE OF CLEANLINESS / TIDINESS OF SCHOOL PREMISES Comment in block to right >	Tick as appropriate :		
		GOOD	POOR
	Grounds and Premises		
	Classrooms and Buildings		
	Toilets		

		YES	NO
EVIDENCE OF UNDER-ENROLMENT EVIDENCE OF OVER-ENROLMENT	DEFINITION Learner numbers as related to available space (1:40 primary schools / 1:35 secondary schools)		
DISPLAY OF NATIONAL SYMBOLS (at least one)			
EVIDENCE OF VANDALISM			

2. PERSONNEL MATTERS

CATEGORY	A TOTAL NUMBER **EMPLOYED** AT SCHOOL **(as per payroll)**	B TOTAL NUMBER OF PERSONNEL **REPORTING** TO THE SCHOOL	C DISCRE-PENCY BETWEEN **(A)** and **(B)** **(identify & provide details)**	D TOTAL NUMBER REPORTING AT THE SCHOOL **(B)** THAT ARE **PRESENT**	E TOTAL NUMBER REPORTING AT THE SCHOOL **(B)** THAT ARE **ABSENT**
STATE PAID TEACHERS (Grades 1-12)					
STATE PAID GRADE R TEACHERS					
STATE PAID NON TEACHING PERSONNEL					

Details of personnel on protracted leave (*excluding accouchement leave*): more than 3 months

NAME	PERSAL NO.	TYPE OF LEAVE

2016 PPN CERTIFICATE State PPN _____ Is the school staffed according to PPN? Answer in block to right >	Yes / No	If "No", give reasons and corrective action

VACANT POSTS (against an established post)	Number of Vacancies	Action
PRINCIPAL		
DEPUTY PRINCIPAL		
HEAD OF DEPT		
PL 1 TEACHER		
ADMINISTRATION		

VACANT POSTS (against an established post)	Number of Vacancies	Action
GENERAL ASSISTANT		
SECURITY GUARD		

3. LEARNER ATTENDANCE

GRADE	TOTAL ENROLMENT	No PRESENT	
GR R			
GR 1			
GR 2			
GR 3			
GR 4			
GR 5			
GR 6			
GR 7			
GR 8			
GR 9			
GR 10			
GR 11			
GR 12			
TOTALS			

4. MANAGEMENT AND OPERATIONS

	CRITERIA	EVIDENCE AVAILABLE Yes / No	WHERE EV AVAILABLE COMMENT (ME
1.	Is the Time Book available and signed?		
2.	Is there a functional Safety and Security Committee?		
3.	Are Log Book entries up to date?		
4.	Is the Leave Register up to date?		
5.	Does the school have an Admission Policy?		
6.	Are admissions for 2016 complete?		
7.	Has LTSM been delivered as ordered:		
	▪ Textbooks		
	▪ Stationery		
8.	If the answer to number 7 is' NO', have shortages of textbooks / stationery been attended to?		
9.	Has the school received the following DBE Workbooks Volume 1 for 2016: ▪ English HL or FAL: Grades: 1 – 6 ▪ Mathematics: Grades 1 - 9		
10.	Has the school distributed the following LTSM to ALL learners:		
	▪ Textbooks		
	▪ Stationery		
	▪ Workbooks		
11.	At the end of 2015, did the school retrieve the textbooks that had been supplied to learners?		Give % of textbo
12.	Is the composite timetable compliant with instructional time of each subject in NCS – CAPS?		
13.	Is the homework timetable available?		
14.	Is Teaching and Learning taking place?		
15.	Is the school in the NSNP Programme?		
16.	If the answer to number 15 is 'YES', are meals prepared per policy?		

5. CRITICAL ISSUES TO BE ADDRESSED

1.	
2.	
3.	

NAME & SIGNATURE: PRINCIPAL

NAME & SIGNATURE: MONI

SCHOOL STAMP

NAME & SIGNATURE: MONI