

AN EVALUATION OF THE ENGINEERING STUDIES CURRICULUM AT
IKHALA PUBLIC FURTHER EDUCATION AND TRAINING COLLEGE

by

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DECLARATION

I, Mkululi Kaizer Nyaba, hereby declare that the dissertation handed in for the qualification Magister Artium in Higher Education Studies at the University of the Free State is my own work and that I have not previously submitted the same work for a qualification at/in another university/faculty. I further concede copyright to the University of the Free State.

SIGNATURE

DATE

DEDICATION

I dedicate this script to Sindiswa Jean Nyaba, my wife, who always encouraged me during my reading and writing. Thanks for being a caring partner and being there for me at my most trying moments. To my children, who always encourage me, and especially my little daughter and son, Kuhle and Hlumelo. To all my family and in-laws for their understanding. Finally, to my late mother (Mamgcina).

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SUMMARY

Further Education and Training (FET) colleges have the task of educating and training young people for entry into the workplace, for self-employment, for higher education studies and for up skilling and re-skilling competence levels (Nzimande 2009). This means that the FET curricula and their close link to the professional world make it a sector that contributes to most of the training of a sufficiently skilled workforce that would meet the labour market demands. Technical and vocational education and training is essential in this regard because no country can meet its economic and social demands without a skilled work/labour force.

The purpose of this study, therefore, is to evaluate the National Education (NATED) Engineering curriculum at the Ezibeleni Engineering Campus to determine whether the curriculum is appropriate in preparing the students sufficiently for a career in engineering opportunities. Certain shortcomings in the NATED curricula are identified in this study and innovations are recommended with the aim of contributing to the establishment of a consistent engineering curriculum which will be able to meet the technological developments and inculcate the skills required in the world of work. With the inception of the new National Certificate (Vocational) (NC (V)) curriculum in 2007 and the phasing out of the NATED curriculum by the end of 2009, more areas for research are created in the FET college sector. Only the future will tell whether the new NC (V) curricula will be an improvement on the NATED curriculum.

In an attempt to evaluate the Engineering curriculum and to determine the appropriateness thereof, the researcher employed qualitative and quantitative research methodologies. Valuable insights were derived from the literature study which served as a basis for the questions that were asked during the interviews and for the questions that were included in the questionnaire survey

that were distributed among the academic staff. By mixing qualitative and quantitative methods the researcher aimed to triangulate the findings from the interviews and the questionnaire survey to enhance the validity and reliability of the study (Maree 2007:80).

The findings of the interviews and survey were finally interpreted in terms of responses pertaining to the problem that was investigated. Despite the fact that the NATED curriculum is currently being phased out, critical shortcomings have been identified such as, inter alia, the non-alignment of the engineering curriculum with the professional world, theory and practice that are not linked, inability to accommodate apprentices, and non-compliance with the SAQA (South African Qualifications Authority) requirements.

The study concluded by recommending that FET College engineering programmes should be taken to a new level to make them acceptable to universities, universities of technology and to the industry in South Africa. FET colleges should begin to take the responsibility for arranging work placement for their students. The Department of education, FET colleges and industry should form collaborative partnerships to develop colleges as specialist or niche centres for vocational and technical excellence.

KEY CONCEPTS: vocational education and training, Further Education and Training, National Certificate (Vocational), Engineering Curriculum, Further Education and Training Act, higher education, NATED programmes

OPSOMMING

Verdere Onderwys en Opleiding (VOO) kolleges het dit ten doel om jong mense op te lei vir toegang tot werkplekke, vir selfwerkzaamheid, vir hoëronde wysstudies en om vaardighede aan te leer of op te knap tot die nodige bekwaamheidsvlakke (Nzimande 2009:1van1). Dit beteken dat die VOO kurrikulums en hul nou verband met die werkswêreld, dit 'n sektor maak wat bydra tot die opleiding van 'n groot groep werkers wat genoegsame vaardighede het om aan arbeidsmagsvereistes te voldoen.

Tegniese en beroepsopleiding en onderwys is uiters noodsaaklik in die verband, want geen land kan aan sy ekonomiese en sosiale vereistes voldoen sonder 'n vaardige arbeidsmag nie. Die doel van hierdie studie is dus om die (NASOP) Nasionale Opvoeding Ingenieurswese-kurrikulum te evalueer om die Ezibeleni Ingenieurswese-kampus om vas te stel of die kurrikulum toepaslike opleiding verskaf aan studente wat die ingenieursberoep wil betree.

Sekere tekortkomings in die NASOP kurrikulum word blootgelê in die studie, en vernuwings word aanbeveel met die doel om 'n konsekwente ingenieurswese-kurrikulum daar te stel wat studente sal voorberei om voortdurende tegniese ontwikkelings te kan hanteer deur al die nodige vaardighede daartoe aan te leer sodat hulle die beroepswêreld met vertroue kan betree.

Met die ingebruikneming van die nuwe NS(B) Nasionale Sertifikaat (Beroeps) kurrikulum in 2007 en die uitfasering van NATED kurrikulums aan die einde van 2009, word meer navorsingsgeleenthede in die VOO kollegegebied geskep. Slegs die toekoms sal bepaal of die nuwe NS(B) kurrikulum 'n verbetering sal wees op die NASOP kurrikulum.

In 'n poging om die Ingenieurswese-kurrikulum te evalueer en om die toepaslikheid daarvan te bepaal, het die navorser 'n kwalitatiewe en kwantitatiewe navorsingsmedologie

gebruik. Waardevolle insigte het gespruit uit die literatuurstudie wat as basis gedien het vir die vrae wat gedurende die onderhoude gestel is en vir die vrae wat in die vraelysopname, wat aan akademiese personeel verskaf is, ingesluit is. Deur kwalitatiewe en kwantitatiewe metodes te vermeng, wil die navorser probeer om die bevindinge van die onderhoude en vraelyste te trianguleer om die geldigheid en betroubaarheid van die studie te versterk (Maree 2007:80).

Die bevindinge van die onderhoude en opname is uiteindelik geïnterpreteer ingevolge die antwoorde wat betrekking het op die probleem wat ondersoek word. Ten spyte daarvan dat die NASOP kurrikulum tans uitgefaseer word, is kritiese tekortkominge geïdentifiseer, soos onder andere die ongerigtheid van die ingenieurswese-kurrikulum wat betref die werksrealiteite; teorie en praktyk wat nie gekoppel is nie; onvermoë om vakleerlinge te akkommodeer, en nie-nakoming van die SAKO (Suid-Afrikaanse Kwalifikasie Owerheid) se bepalings.

Die studie is afgesluit met 'n aanbeveling dat die VOO kollege ingenieuswese-programme tot 'n hoër vlak geneem moet word om hulle aanvaarbaar te maak vir universiteite, universiteite van tegnologie en Suid-Afrikaanse industrieë. VOO kolleges moet verantwoordelikheid begin aanvaar vir die plasing van hul studente. Die onderwysdepartement, VOO kolleges en industrieë moet begin saamwerk om kolleges te ontwikkel tot spesialisierungs- of nissentrusms beroeps- en tegniese uitnemendheid.

SLEUTELWOORDE: beroepsonderwys en-opleiding, Verdere Onderwys en Opleiding, Nasionale Sertifikaat (beroepsgerig), Ingenieurswese-kurrikulum, Wet op Verdere Onderwys en opleiding, hoër onderwys, NASOP programme.

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LIST OF ACRONYMS

FET	Further Education and training
NBFET	National Board on Further Education and Training
NQF	National Qualification Framework
HRSC	Human Science Research Council
DoE	Department of Education
DoL	Department of Labour
DET	Department of Education and Training
SME	Small Medium Enterprise
OBE	Outcomes Based Education
IT	Information Technology
CDE	Centre for development of Enterprise
NC(v)	National Certificate Vocational
NATED	National Education
SAQA	South African Qualifications Authority
AsgiSA	Accelerated and Shared growth Initiative for South Africa
JIPSA	Joint Initiative on Priority Skills
HE	Higher Education
CCF	College Collaboration Fund
SETA	Sector Education and training Authorities
NTTFE	National Task Team of Further Education
NCFE	National Committee on Further Education
UNESCO	United Nation Educational, Scientific and Cultural Organisation

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

The Ezibeleni Technical College was established in 1984 by the Transkei Government. The restructuring of the Further Education and Training (FET) College sector began in late 2001, following the launch of the New Institutional Landscape for FET colleges. The merging of 152 technical colleges into 50 FET Colleges was undertaken across the country (RSA Republic of South Africa 2006:6). The legislation and subsequent policy implementation process driven by the Department of Education, sought to put in place an enabling environment for institutions from different historical backgrounds to consolidate resources, overcome duplication and harness innovation.

The Engineering campus is one of the Ikhala Public FET College campuses specialising in engineering and, according to JIPSA (Joint Initiative on Priority Skills Acquisition), Engineering is not the only growth sector area of skills shortages, there are also sectors such as Construction, Financial management, Management, IT (Information Technology), Tourism and Business Process Outsourcing (RSA DoE 2007:4).

The Ezibeleni Engineering College is situated in the northern region of the Eastern Cape Province. It was renamed Ezibeleni Engineering campus after the merger. It intended to offer students a means of specialising in engineering and provide programmes that would directly meet the needs of the global economy (RSA DoE Republic of South Africa Department of Education 2000:11). Furthermore, it was to be part of the government's strategy to address skill shortages, job creation and economic growth (RSA DoE 2007:4).

The NATED (National Department of Education) Engineering studies curriculum at the Ikhala Public FET College has become an issue of concern to the educators of the Engineering campus. There is ongoing poor performance of learners in examinations at the Ezibeleni Engineering campus, despite numerous efforts by the Engineering educators to improve the situation. It appears as if this curriculum at the engineering campus does not prepare and train learners adequately for further learning, employment and self-employment in electrical, mechanical and civil engineering. It was on the basis of this background that the researcher decided to undertake a critical study of the Engineering studies curriculum at the Ezibeleni Engineering Campus.

The Ezibeleni Engineering Campus is one of the seven campuses of the Ikhala Public FET College. The Ezibeleni Engineering Campus offers the following study areas namely, mechanical, electrical and civil engineering.

According to the National Board for Further Education and Training (NBFET) (RSA DoE 2004:5) Further Education and Training (FET) programmes provided by the colleges are constrained due to the following aspects: narrow educational concerns, they are too general and offer little or no specialisation. With this in mind, it is clear that there is a need to identify the problem areas in the engineering studies department of the Ikhala Public FET College, and to find possible solutions to these problems. An evaluation of the NATED programmes could reveal the shortcomings and problems that need to be addressed.

During the finalisation of this study (towards the end of 2009) the NATED programmes had almost been phased out while the new NC(V) curriculum, (see 2.4) with its own unique emerging problems, is in its third phase of implementation. Hopefully, this study may also contribute to addressing current and future problems that FET curricula may encounter.

The NATED programmes seem to be well suited for the training of apprentices, because the apprentices gain practical experience by working in their particular fields of study for at least nine months of the year, and thereafter they return to the college to attend classes for a period of three months. This, however, was not the case with the learners who enrolled for the engineering programmes at the Ezibeleni Engineering Campus because they did not have practical exposure. This is a cause for concern and the most important factor that has to be taken into consideration for an evaluation of the curriculum at the Ezibeleni Engineering Campus.

Since 1994, several education policy documents have been produced by the National Department of Education with the aim of transforming and restructuring the education system inherited from the apartheid regime. The need to transform the curriculum is emphasised in all these documents (RSA DoE 2004).

For the past fifteen years curriculum and curriculum related issues have been at the centre of any attempts to transform the inherited education system. Transformation of the curriculum in the Further Education and Training band (FET) is important because FET is situated at the intersection of a range of government policies that are critical to the construction of the new South African society. It should be mentioned that curriculum is a problematic and disputed terrain of contestation.

Education and curriculum are acts of government, and are set within relations of political and socio-economic domination and subordination. Curriculum development and implementation are also philosophical and moral acts, which are formed by the values of those who have access to the structures through which a curriculum is planned, implemented and evaluated (Rasool 1999:s.a).

1.2 STATEMENT OF THE RESEARCH PROBLEM

Technological developments and the skills required in the engineering industry had an impact on the demands for an evaluation of the NATED curriculum at the Ezibeleni Engineering campus. The origin of the skills shortages lies within education and training. According to a study done by the Human Sciences Research Council (HSRC) in 2004, South Africa was experiencing a shortage of 20,000 artisans.

Unemployment is growing and the need for skilled vocational educators and a credible and high quality technical and vocational education system have become an urgent matter in South Africa (SAIDE South African Institute for Distance Education 2006:5).

The further education system does not deliver sufficient entrants to the training system with the necessary skills, attitude and values upon which further skills for the workplace can be developed. Where education falls short employers and the training system have to bridge the gap (Bernstein 2007).

Certain shortcomings in the NATED curriculum, currently being phased out, are discussed below:

- Due to the separation of theory and practice programmes fail to meet the needs of the learners and the changing demands of the economy and society, hence contributing to the high levels of unemployment.
- Poorly articulated programmes and qualifications do not expose learners to a curriculum that focuses broadly on all aspects of career development. The current workplace is characterised by global competition, cultural diversity, technological and management processes that require learners to think critically, solve problems and communicate effectively.
- Programmes differ widely with respect to quality, which means that programmes offered are not in line with the NQF (National

Qualification Framework) and do not comply with the OBE (Outcomes-based Education) stipulations.

- There is no clear exit from FET to Higher Education and learners exiting the programme at NQF level four have to repeat subjects that they have already passed when they register at institutions of higher education.
- Learners exiting the system are unemployable because of a lack of practical training and experience.

It therefore appears that the NATED curriculum does not prepare learners adequately for employment, self-employment and for access to higher education.

1.2.1 EVALUATION OF THE CURRICULUM

Evaluation of the curriculum in this study refers to the process by which judgement is made about the worth or merit of the curriculum or its appropriateness for the individual, the group, the organisation offering it or the society within which it operates. These judgements depend on the value system of the judges, the questions that they ask and the evidence collected by them (McMillan and Schumacher 2001:10).

Evaluation of a curriculum usually involves collecting data before, during and after the intended learning events have taken place, depending on whether the evaluation is for approval, or for developmental purposes, or part of the quality assurance systems in place for that curriculum (Melrose 1998:37-38).

1.3 RESEARCH QUESTIONS

The above information led to the following main question, which this study intends to investigate.

1.3.1 MAIN RESEARCH QUESTION

Is the NATED curriculum which is currently being phased out at the Ezibeleni Engineering Studies Campus appropriate in preparing students sufficiently for a career in engineering opportunities?

In an attempt to address the main question, the following subsidiary questions came to the fore:

- Does the NATED Engineering curriculum comply with the SAQA (South Africa National Qualifications Authority) guidelines?
- Is this Engineering curriculum aligned to the professional world?
- Does the NATED engineering curriculum link theory and practice?
- What are the identified shortcomings of the NATED curriculum at the Engineering campus?
- How can the shortcomings of this curriculum be addressed at the Engineering Studies campus?

These questions directly inform the aims and objectives of the study.

1.4 AIM AND OBJECTIVES

The aim of the study is to determine the appropriateness of the NATED engineering studies curriculum at the Ikhala Public Further Education and Training College and to establish whether this curriculum prepares the students adequately for the world of work.

In realising this aim, the following objectives will be pursued:

- To undertake a literature review on the background of FET colleges and the NATED curriculum.
- To review documents and policies to determine whether the engineering curriculum complies with the national guidelines.
- To establish whether the curriculum is aligned to the professional world.
- To determine whether the curriculum links theory and practice.
- To identify shortcomings in the engineering curriculum.
- To make recommendations on how to address these shortcomings in the engineering curriculum.

1.5 THE SIGNIFICANCE OF THE STUDY

The study may be considered beneficial to the Ikhala Engineering campus and to its learners, lecturers/ facilitators of learning and to the industry, as it aims to promote a single curriculum framework that will adhere to the requirements as prescribed by the policy. This study is also an attempt to promote a curriculum that will directly meet the needs of the community and the industry. The study includes electrical, mechanical and civil engineering and may also assist other FET institutions facing similar problems relating to the curriculum in their engineering departments. Bernstein (2007 s.a) is of the opinion that to overcome skills shortages a new way of thinking about the roles of the government and in education and training is needed. Sufficiently trained and skilled artisans are the result of good schooling. The outcome of this study as previously mentioned in 1.1, may also contribute to possible solutions to problems currently experienced with the new NC(V) curriculum.

1.6 CLARIFICATION OF CONCEPTS

The following concepts need clarification:

1.6.1 CURRICULUM

A curriculum is all the planned learning activities offered by an institution to learners and the experiences learners encounter when the curriculum is implemented. The concept includes the subject matter that learners are exposed to, as well as the teaching and learning methods and assessment modes. These follow closely from aims and differing beliefs as well as values about the purpose of schooling that lead to the selection of different subject matter, teaching styles and modes of evaluation.

In the context of this study, the term "curriculum" should be understood to include all the teaching and learning activities that take place in a learning situation (RSA DOE 2000:11). Furthermore, it deals with standard setting, the development and delivery of the learning programmes as well as assessment processes. Quality assurance is also dealt with according to the South Africa Qualifications Authority (RSA DoE 1995).

1.6.2 PARADIGMATIC PERSPECTIVE

This study will be following an interpretivist-positive paradigm in which qualitative and quantitative approaches are combined. According to Maree (2007:289), an interpretative study is generally an attempt that makes the researcher understand phenomena through the meaning that an individual or a group of people make. It is also a process where by the phenomena under study is being analysed and insight is provided into the way in which people think.

The researcher will have an opportunity to interact with the participants so as to be able to get a clear understanding of what

the perceptions of the educators are with regard to the NATED curriculum.

The researcher has also applied a positivist (quantitative) approach because, in order for the researcher to obtain answers from the respondents, he will also implement a questionnaire.

1.6.3 EVALUATION (OF THE NATED CURRICULUM)

Evaluation in this study is used in the context of curriculum evaluation to determine whether the engineering studies curriculum is appropriate to provide learners with the necessary knowledge, skills values and attitudes to meet the demands of the growing national and global economy.

It is a process of judgement used to gather information about the value of something. The process is about making judgements on the merit or worth (quality) of the curriculum and its appropriateness for the individual, the group, the organisation offering it or the society within which it operates (Melrose 1998:37).

Evaluation involves an interpretation of what has been gathered through measurements, and in which value judgements are made about the effectiveness and efficiency of something (McMillan and Schumacher 2001:10). Evaluation further involves identifying strengths and weaknesses of the curriculum and recommending ways in which the identified weaknesses can be addressed (McMillan and Schumacher 2001:10).

1.6.4 ENGINEERING STUDIES

Engineering studies is the discipline and profession of applying scientific knowledge and utilising natural laws and physical resources in order to design and implement materials, structures, machines, devices, systems and procedures that realise desired objectives and meet specified criteria.

1.7 RESEARCH DESIGN AND METHODOLOGY

Qualitative and quantitative methods of research were applied in this study. Document analyses as well as semi-structured interviews were conducted. Questionnaires were also distributed among staff. The academic staff members (lecturers) at the Ezibeleni Engineering campus were selected as a sample for this investigation.

Gathering of data commenced with the evaluation of the curriculum at the Ezibeleni Engineering Campus. Documents, for example, reports and policies were also consulted. Informal pilot interviews were conducted with five academic staff members who were purposefully selected from electrical, mechanical and civil engineering. The comments gathered from the pilot study led to the compilation of a structured questionnaire, which was employed in a survey to determine the perceptions of staff members regarding the appropriateness of the current curriculum at the Engineering Studies Campus. The quantitative data were analysed, interpreted and reported in terms of percentages of the total number of responses, while categories of meaning were searched for in the qualitative data (De Vos 2005:338 and Kruger, De Vos, Fouché and Venter 2005:217).

According to Babbie and Mouton (2001:363) define evaluation research as "the use of social research procedures to systematically investigate the effectiveness of social intervention programmes, in other words to determine the worth of an educational programme, procedure, product or objective". The evaluation can serve a formative purpose which is mostly applied for improving a programme or a summative purpose where it is decided whether a programme should be continued.

The evaluation research will determine whether this programme is effective and whether it is doing what it is supposed to do (McMillan and Schumacher 2001:20).

For the purpose of this study the researcher wants to identify shortcomings of the NATED engineering programmes because it appears as if this programme is not doing what it was supposed to do, therefore a formative evaluation is applied with the aim of producing some intended results Babbie and Mouton(2001:363). Fouche and De Vos (2005:108) explain that evaluation research is a type of applied research and may be in the form of a qualitative or a quantitative research method or a combination of both these research methods. In this particular study the researcher applied both methods and used triangulation.

1.7.1 TRIANGULATION

Triangulation design is a mixed methods design where the researcher uses both qualitative and quantitative methods. Triangulation is most suitable when the researcher wants to collect both types of data about one topic at the same time Ivankova, Creswell and Clark (2007:266).

The researcher has applied triangulation in this study because; triangulation is a strategy that is applied to improve the validity and reliability of evaluating curriculum (Nieuwenhuis 2007:80). Triangulation is therefore suitable for this study because it focuses on both methods that are applied.

1.7.2. POPULATION AND SAMPLE

This study will be conducted at the Ezibeleni Engineering Campus situated at the Ikhala Public Further Education and Training College. The target population of the study is the lecturing staff members at the Ezibeleni Engineering campus. The lecturers' were selected on the basis of convenience due to their accessibility and availability.

In order to ensure that the sample used for investigation would be of knowledgeable and informative value for the purpose of this study the researcher purposefully decided to include all fifteen academic staff members (lectures) at the Ezibeleni Engineering Campus. The sampling method can, therefore, be typified as purposeful and convenient in nature (McMillan and Schumacher 2001:176).

Fifteen questionnaires were distributed among the staff members of the Engineering campus, of which only ten were returned this represented a final response rate of 67%. Babbie and Mouton (2001:261) are of the opinion that a response rate of 50% is adequate for analysis and reporting, a response rate of 60% is good and a response rate of 70% is very good. The 67% response rate for this study may therefore be regarded as a good to very good response rate.

A sample of five academic staff members was selected purposefully for the interview survey.

1.7.3 DATA COLLECTION TECHNIQUES

The tools that were used to collect data included a study of documents, policies and other relevant literature on the topic. Questionnaires were distributed and interviews conducted to obtain the necessary data. The interviews were conducted by making use of an interview schedule consisting of a number of open-ended questions. The questionnaire in turn consisted of closed-ended questions, as well as open-ended questions (Newton 2001:178).

1.7.4 ANALYSIS AND REPORTING

Five academic staff members were interviewed in order to obtain in-depth information about the appropriateness of the curriculum at the Ezibeleni Engineering campus. The interviews were analysed by identifying categories of meanings.

The researcher personally distributed the questionnaires among the academic staff members of the campus. These questionnaires were collected two weeks later. The data collected from the questionnaires were analysed by calculating the frequencies of the responses and expressing these as percentages of the total number of responses.

1.8 DEMARCATION OF THE STUDY

The study falls within the field of Further Education and Training and deals specifically with the issue of an evaluation of the curriculum at the Engineering studies campus of the Ikhala Public FET College in the northern region of the Eastern Cape Province.

1.8.1 LIMITATIONS OF THE STUDY

During the finalisation of this study the new National Certificate (Vocational) NC(V) was in the process of being implemented and the NATED programme in the process of being phased out.

Inter alia, the limitations of this study include that the researcher was handicapped during the pilot questionnaire study by the fact that most of the academic staff were not available for comment on the questionnaire because they were attending an assessor-training course. Another limitation could be that the educators might have responded to the questions without understanding the questions. This possibility may have had an influence on this study in terms of time, data analysis and completion of the whole dissertation.

1.8.2 TRUSTWORTHINESS

The researcher argued for the trustworthiness (see 4.6.3) of this study in terms of its credibility, transferability, dependability.

1.8.3 VALIDITY AND RELIABILITY

Dependability and conformability of the interview survey as well as the validity and reliability of the questionnaire survey were discussed in Chapter four (see 4.7.3 and 4.7.4).

1.8.4 ETHICAL CONSIDERATION

Ethical issues are defined as a set of accepted principles within a particular study that the researcher is engaged on. It is important for any researcher to highlight ethical considerations in his/her study (Strydom 2002:75).

Ethical consideration in this study is applied for the purposes of confidentiality of the respondents and the participants (Maree and Westhuizen 2007:75).

1.9 DIVISION OF CHAPTERS

The chapters in this study are constituted as follows:

Chapter one presents an introduction to the study and includes the problem statement, aims and objectives, research questions as well as a brief discussion of the research design and methodology employed.

Chapter two provides a literature review of the Further Education and Training (FET) curriculum and, more specifically, of the engineering studies curriculum.

Chapter three presents a literature review on the role of FET in preparation for employment.

Chapter four describes the research design and methodology employed in this investigation in more detail.

Chapter five provides a report on the results of the empirical investigation undertaken.

Chapter six includes the conclusion, recommendations and summative perspective resulting from the study.

1.10 CONCLUSION AND CONCLUDING REMARKS

The NATED Engineering curriculum in use at the Ezibeleni Engineering Campus seems to be beset by shortcomings. This situation is even worse in the FET colleges, which means that there is a need for the laying of a solid foundation for the development of an effective curriculum at the FET colleges. If the challenges raised above are to be dealt with, with the involvement of the implementers themselves, a crucial step will have to be taken. All role players, for example the educators, the Department of Education and industry, have to be on board for the process to succeed. Curriculum development is not a static process and it is important that FET providers and practitioners are active in the development of FET curriculum.

This chapter provides a background to the research problem in as far as the introduction, the statement of the problem, the aim, as well as the objectives of the study are concerned. The chapter also describes the research methodology and design employed in this study.

In the following chapters a literature review will provide an overview on the NATED curriculum at the Engineering Studies campus of the Ikhala Public FET College as well as a background study on

FET colleges. The recent legislation and policy documents that are intended to change the nature of technical and vocational education and training in South Africa are also dealt with in the next two literature chapters.

CHAPTER TWO

FURTHER EDUCATION AND TRAINING CURRICULUM IN SOUTH AFRICA

2.1 INTRODUCTION

An effective Further Education and Training (FET) system provides a diversified programme offering the knowledge, skills, attitudes and values South Africans require as individuals and as citizens, as lifelong learners and as economically productive members of society. It should furthermore provide the vital intermediate steps to higher-level skills and competencies that the country needs to chart its own course in the globally competitive world of the 21st century (RSA DoE Republic of South Africa. Department of education 1998a:14).

The task of building knowledge and skills has for a long time been the responsibility of technical colleges. For many years this responsibility and task was part of the apprenticeship system, which prepared young men from one population group only, for entry into the engineering trades. The decline of the apprenticeship system and the subsequent lack of opportunities for students to gain practical work experience has made a fundamental overhaul of programmes and provisions in FET institutions very necessary (RSA DoE 2001:12).

What was visualised and proposed, was a new and a dynamic FET college sector that can meet a multitude of needs. It is necessary to refer to the Institutional Landscape document to show the scope that was required of a FET college (RSA DoE 2001:6).

The support for lifelong learning requires a network of FET colleges. The system needs to work with different partners to deliver responsive and relevant programmes to meet the needs of individuals and the wider social and business community as a whole. The achievement of a national policy imperative of redress

and economic inclusion depend on the existence of accessible, high-quality and cost effective learning opportunities for young people and adults (RSA DoE 2001:6).

This chapter addresses the nature of intermediate knowledge and skills. It is also concerned with issues of the curriculum in Further Education and Training (FET), given the broader curriculum, with specific reference to the Ezibeleni Engineering campus of the Ikhala Public FET College.

2.2 FURTHER EDUCATION AND TRAINING CURRICULUM

Curriculum experts contend that a curriculum does not simply happen or come into being; rather it is linked to a number of forces; namely educational policy which plays a critical role in determining what is included in the official curriculum, and the social, political and economic forces that affect it (RSA DoE 1998a:11).

Curriculum in its broadest sense is the need to look at the values and assumptions that underlie a particular curriculum. One should not look at the curriculum within the educational institution or education system but also within the external relation of the curriculum to society. In this sense, the term curriculum should be understood to include everything that happens in a teaching and learning situation (RSA DoE 2000:11).

From these definitions of curriculum it becomes clear that there are complex and different ways of understanding the concept of curriculum (see 1.6.1). Curricula differ in practice, for example, the curriculum in the apartheid era was different from a curriculum that currently caters for the new dispensation in South Africa. The new dispensation aims to expose learners in FET to a curriculum that focuses broadly on all aspects of career development. It is, therefore, the responsibility of the Ezibeleni Engineering campus staff to align the campus curriculum with the

curriculum that caters for the new dispensation (RSA DoE 2000:21). It is, furthermore, important for the Ezibeleni Engineering campus and its lecturers to make sure that the curriculum at this campus prepares the students sufficiently for employment and self-employment.

2.2.1 A HISTORICAL PERSPECTIVE OF THE FET CURRICULUM

One traces the origins of technical education from industrial or vocational education. These two pathways were connected and partly determined by South Africa's racial legacy, where black workers were excluded from the opportunity to obtain a technical qualification. According to Badroodien (2004:20), skills such as painting, bricklaying, plastering and engine cleaning were regarded as suitable for non-whites only.

A poor economic condition in the 1980's left many white South Africans with financial difficulties. These "poor whites youths" left school at a very young age without any skills and the government was obliged to develop a strategy to accommodate these ill-equipped white youths for life (Badroodien 2004:24).

This resulted in the technical and vocational education system being characterised by race and social status. Technical and vocational education, however, were also drawn in directions that bear a resemblance to the division between good skills and poor skills that emerged from economic and employer perspectives (Gamble 2003:5).

Technical and vocational skills training, which includes apprenticeship was compulsory for white South African tradesmen until the 1960's. The warning was clear: The history of racial discrimination in the sector should not be repeated. The focus should rather be on the ability of the Ezibeleni Engineering campus to balance the theory and practice combination. The call is for an increased responsiveness of the Ezibeleni Engineering

campus that, may lead to focus on a practical and occupational qualification that represents the outcomes of the learning process. The continuation of job training is a challenge from an educational point of view (Gamble 2003:5).

2.2.2 FET CURRICULUM FROM PAST TO FUTURE

FET Colleges in South Africa offered NATED programmes that were trade-based and very narrow in content. They were designed to meet the low-wage industries and not aligned with the economic trends of the country (Mbanguta 2002). Theory programmes such as N1-N3 which led to N4 and N6 at a latter stage, and then to a National Diploma or Second National Diploma in Engineering, were offered by the FET colleges.

The FET College programmes in engineering were narrow in content and their qualifications were not recognised by higher education institutions. The new interpretation of the qualification based on the Outcomes-Based Education (OBE) was outlined on the FET Act (no. 98) and the Education White Paper 4 (RSA DoE 1998a). These Acts were promulgated for the easy articulation of FET programmes to Higher Education and for FET colleges to respond to the needs of the Industry.

The Ikhala Engineering Campus is currently functioning in an environment marked by both institutional and curricular change (Gamble 2003:6). Curriculum transformation is presented by a decisive break of the present with the past in order to develop new ways of presenting the curricula, with support for an integrated approach to education and vocational training. It is clear that changes in professional world have a direct impact on vocational training and FET colleges such as the Ezibeleni Engineering campus have to respond to these changes and continually adapt to the curriculum requirements of the workplace. To shift from the past is a way of focussing on the future of the new curriculum at the Ezibeleni Engineering Campus. The strategies

that were followed in Scotland and England in order to achieve a unified system of academic and vocational learning gave rise to a radical concept of unification that was related to the view of transformation of the global order (Gamble 2003:7).

During the curriculum transformation, the past should not be criticised too harshly or ignored. It should rather be viewed as a stepping stone to the future. Further analysis needs to be done in terms of the language proficiency in FET institutions as this is a critical aspect to be dealt with, since English is the main language of instruction in FET Colleges. For many students English is their second or third language.

2.2.3 LANGUAGE PROFICIENCY IN TEACHING AND LEARNING IN FET

Indigenous languages and communication are traditionally not regarded as an issue in the technical and vocational curriculum in South African technical colleges. Subjects in engineering studies, for example, mathematics, science, trade theory and engineering drawing, were traditionally instructed in one of the two official languages, namely, English or Afrikaans. In 1998, more than 70 per cent of head count enrolments at all the FET colleges were black learners (Gamble 2003:57). Experience has shown that in technical education language inadequacies and poor comprehension are among the biggest challenges faced by students. The integration of previously disadvantaged black African students into former predominantly white schools since 1994 is forcing the language problem to be addressed (Cosser 2003:53).

However, the controversy continues as to whether the learner's mother tongue or English is preferable as the language of instruction. Language inadequacies are a challenge to the majority of students at the Ezibeleni Engineering campus because English is seldom good enough to be a meaningful educational tool. (Gamble 2003:s.a) recommends the following:

- Support programmes to improve proficiency in English;

- Implement a model in which two language are used for instruction;
- Use African languages as languages of instruction.

It is clear that learners prefer to be taught in English, as they know that they are examined in English and that the communicative competence in English plays an important role in their lives. It is understood that the development of communicative competence is not the primary responsibility of FET colleges but, be this as it may, curriculum reform should take this into account (Cosser 2003:53).

2.2.4 LANGUAGE AND COMMUNICATIVE COMPETENCE IN FET

Employers in industry demand communication competence, which is usually in English and Afrikaans in the South African context. It is recognised that FET colleges fall short in addressing language and communication challenges. It is therefore important to include specific information content in the FET curriculum, primarily to contribute to the communicative competence of learners in FET institutions. The language competence shows that an acknowledgement of multilingualism is an important step in achieving both an equitable and educationally sound dispensation in terms of teaching and learning and curriculum development (Gamble 2003:59).

The need for the development of an appropriate curriculum, in a multilingual environment, to take account of both proficiency in language and competence in communication, are key determinants for the success of learners. This is true in the workplace environment and in other spheres of their lives. Failure to address these issues will make employability wishful thinking (Gamble 2003:59).

2.2.5 THE EVOLUTION OF VOCATIONAL EDUCATION AND TRAINING CURRICULUM

Technical and vocational education and training have evolved from their inception in response to changes in society. These changes were shaped by social, political and economic factors, technology and the workplace. The demand for technical and vocational education in South Africa arose because of an accelerated industrial development. In the previous dispensation technical and vocational education in South Africa was only made available to the white community. It was linked to the development of railways, mining, harbours and small engineering workshops in urban areas (Gamble 2003:7).

Historians are of the opinion that technical education refers to a type of education which has reference to manufacturing and industrial pursuits as well as scientific principles underlying these (Gamble 2003:7). The general education system, as well as the system of technical education in South Africa, evolved from a British system.

The link between the curriculum and industry is traced back to the 1800's in England, to show how the curriculum remained insulated from the community demands (Gamble 2003:7). This was as a result of the training of scientists which at that time was dominated by liberal educational models.

Technical and vocational education was predominantly limited to the instruction of science and art that was only applicable to industry. This teaching and training did not accommodate any practical training for industry or preparation for employment. This was in line with the professional requirements of scientists who were educators and examiners. These scientists were secretive about their trade and did not make it known to the lecturers in public teaching. These were the traditional techniques for

preparing young white individuals for work that were adopted in South Africa.

The technical college sector was developed to provide theoretical learning alongside the practical training of the apprenticeship system which was offered by industry in the workplace. Technical colleges were required to offer the theoretical part of apprenticeship training over a period of three months, while five years of the practical training was offered in the workplace (see 1.2).

In the 1970s few technical colleges for black Africans were developed, and according to the Manpower Act of 1981, Africans were excluded from the apprenticeship system. Moreover, black African apprentices were never large in number and in former independent homelands, technical colleges remained racially segregated.

Technical colleges were categorised into three types of colleges namely: the state aided colleges for whites only; Department of Education and Training (DET) colleges for Africans and Coloureds in the Republic of South Africa, and Homelands technical colleges, of which the Ezibeleni Technical college was one (Akoojee 2008:10).

The educational task of technical and vocational education was to prepare young individuals for work. Technical colleges were educational institutions founded in a work-based apprentice system. Today technical and vocational education encompasses not only skills but also sound academic foundations and high qualities needed for success in the workplace.

Despite much criticism, technical colleges have, over the years, produced many fine artisans in South Africa in state-aided technical colleges (Green 1995:139). However, this was not the case with the Ezibeleni Engineering campus, hence the evaluation of the curriculum.

2.3 LESSONS FROM THE PAST

It is important to remember that the future curricula in Further Education and Training colleges should be adequately informed by the curriculum of the past. History showed that technical and vocational education has been informed by a variety of educational components that have fallen under the vocational education umbrella from their origins. These were technical education, technological education and trade industrial education (Gamble 2003:11).

These traditions converged, to set up two pathways in the technical and vocational and training curriculum: one that keeps knowledge and skills together and one that separates skills from its formal knowledge base (Gamble 2003:11). The intermediate level is characterised by the skills shortage within the Eastern Cape Province. To address this challenge an integrated approach to education and training is needed at the Ezibeleni Engineering campus.

2.3.1 SKILLS REQUIRED FOR EMPLOYMENT

It is commonly understood that Vocational Education and Training is aimed directly at preparing learners to meet the labour force needs. The curriculum should serve to define a useful purpose in terms of what the learners might do for a living. In this sense the curriculum at the Ezibeleni Engineering campus is narrower than the educational demands in general where issues of moral, citizenship and 'training of the mind' are concerned. Although these issues are not excluded from the curriculum, current reforms of vocational and further education and training systems at this campus stem primarily from a concern to make the curriculum more responsive to labour market demands (Gamble 2003:13).

Skills development in South Africa should be aligned with the economic and political imperatives of reducing unemployment and

poverty, while not forgetting to foster growth and international competitiveness. It is necessary to foster employment through Vocational Education and Training that is offered by FET Colleges. Colleges need to extend their links with the domestic economy to broaden economic participation and at the same time promote international competitiveness to enhance exports (Ndebele Skills Revolution Indaba: 2).

The question we must answer is how can FET Colleges bridge the above mentioned gap and meet the needs of the industry? During the State of the Nation Address of 2006/7, President Thabo Mbeki identified FET Colleges as a terrain where the 'battle' to correct skills shortage in the country will be fought. FET Colleges are supposed to have the necessary resources and facilities to train students for the 21st century. FET Colleges must make sure that programmes that they offer are properly aligned towards the skills requirements of the provinces and the country, and remain responsive to the changing needs of the economy. The training that they provide should cover a wide range of categories, including the following:

- Targets of the National Skills Development Strategy;
- Training for the Expanded Public Works Programme;
- Design skills training for local industry;
- Training for Small Medium Enterprises (SME).

FET Colleges are seen as key institutions which will educate and train students in relevant skills so that they can fully participate in the economy of the country. FET Colleges are best positioned to intermediate and higher skills needed for economic growth.

The issue of 'relevance' is particularly important for the Ezibeleni Engineering campus that is seeking or experiencing rapid economic and social change within the province. According to Fluitman in Gamble (2003:13) pressures to bring the curriculum

more into line with the economic demand stem from a number of sources, namely:

- **New technologies:** The learners that the FET Colleges train require not only skills that are immediately applicable to the workplace, but also a knowledge base that will enable learners to adapt as products and production methods change.
- **Competitiveness:** The curriculum should develop students who will be able to cope with the ever changing demands of the labour market.
- **Responsiveness:** The curriculum should develop learners that will be able to respond to the demands of industry.
- **High levels of unemployment:** Realising that unemployment is a structural problem in South Africa; the campus should produce learners that are not only employable, but also ready for self-employment.
- **Labour market flexibility:** Learners must possess a variety of skills so that they are qualified to adapt to the changing economy.
- **Structural adjustment:** Industries should revisit their employment structures to enable them to create new job opportunities.

Some of the debates, which lie behind educational policy reforms, are explored in order to sketch a picture of curriculum change and the demands placed on FET institutions. Currently, however, the skills shortage is the issue that dominates debates in the country. The labour market studies done in South Africa show that the demand for artisans has markedly increased (Gamble 2003:13).

2.3.2 TRENDS IN THE FET CURRICULUM

The pressures for the transformation of South Africa's FET sector are compelling and substantial. They emerge out of a wide array of social and economic conditions.

Some of the most pressing demands for change arise from the legacy of apartheid and the social inequalities it generated. Others stem from the sense of a system failure within the FET band itself. The deep-rooted problems that confront the public FET colleges, such as inability to place learners in jobs and the lack of articulation between FET institutions and the labour market, require addressing.

Curriculum reforms and the institutional transformation of FET and Higher Education (HE) institutions have been geared towards ensuring that learners are equipped with skills that are required by the labour market (RSA DoE, 1998a:12). The first step on the path to transformation in 1995 was the establishment of the National Qualification Framework (NQF) which aimed at improving education and training under the auspices of the South African Qualifications Authority (SAQA).

A task team, namely the National Committee on Further Education (NCFE), was appointed in 1997 to investigate the issues and come up with ideas for transformation. The NCFE's report titled "A Framework for the Transformation of FET in South Africa", forms the basis of the Green Paper for FET, the White Paper for FET and the Further Education and training Act (Act No 98 of 1998). This FET Act of 1998 guided and governed the Further Education and Training colleges further down this transformational path of curricula, teaching and learning, qualifications, funding, quality assurance and new institutional arrangements during 1998 to 2006.

In addition to this, the growth in the intake of students has been particularly encouraging in the light of the collaboration between

the Departments of Labour and Education around the National Skills Development Strategy (McGrath 2000:86). The major trends and characteristics of the FET curriculum that have an impact on the evaluation of the curriculum at the Ezibeleni Engineering campus are discussed under sub-headings 2.3.3 to 2.3.5.

2.3.3 THE ENGINEERING CURRICULUM FRAMEWORK

To be able to compete in the global market of the 21st century, serious attention will have to be given to the increasing number of unemployed young people who need to be trained and educated for the future. It has become imperative for the curriculum to shift away from traditional divides between academic and applied learning, theory and practice and knowledge and skills. It was hoped that the new curriculum, such as the NC (V) would move towards a new, balanced learning experience that would provide flexible access to higher education, to lifelong learning and to productive employment.

The balance that is sought in the FET curriculum has been articulated in the National Curriculum statement's vision (RSA DoE and DoL 2002:15). The kind of learner that is envisaged at the Ezibeleni Engineering campus is one who will be imbued with values, knowledge, skills and attitudes. This learner will further act in the interest of a society based on respect for democracy, equality, human dignity and social justice.

2.3.4 POLICY AND LEGISLATION

The vision that the government has put forward for FET is located at the nexus of three key developmental sectors, namely education, labour and industrial and trade development. Clear communication and collaboration between these departments and structures are required (RSA DoE 1998a:49). This will ensure optimal articulation and integration between the policies emanating from these state departments.

Education White Paper four (RSA DoE 1998a:22) clearly indicates that: "the (NATED) curriculum will overcome the outdated divisions between 'academic' and 'vocational' education, between education and training, and will be characterised not by the 'vocationalisation' of education, but by a sound foundation of general knowledge, combined with practical relevance. It is a curriculum that will offer the learner flexibility and choice, whilst ensuring that all programmes and qualifications offer a coherent and a meaningful learning experience".

Two pieces of legislation introduced by the Minister of Labour were the Skills Development Act and the Skills Development Levies Act. These Acts were enacted to improve the quality of learning and to assist learners seeking to join the labour market. The Skills Development Act was also enacted to make provision for a short skills programme in FET Colleges as a strategy for skill development. The skills programme comprises credits that a student should accumulate, leading to a qualification (Akoojee.et al 2005:112).

Further Education and Training colleges have come a long way since the FET Act was implemented in 1998. The FET Act 2006 has brought about a major challenge that has evoked widespread consternation in the college sector throughout the country. The cause for concern is that in terms of this Act, the state is no longer the employer of the college lecturers as the College Councils now become the employers of staff (Akoojee, McGrath, and Visser 2008:9). This has negatively affected the Colleges in the Eastern Cape because some of the lecturers have decided to remain with the state, and Colleges are facing the challenge of recruiting lecturers that have no experience and training as educators. This is having a tremendous effect on the new curriculum NC(V).

2.3.5 DEVELOPMENTS IN THE FET CURRICULUM

The FET curriculum is shifting away from the traditional divides between academic and applied learning, theory and practice, and knowledge and skills (RSA DoE 1998a:42). The new curriculum moves towards a balanced learning experience that provides flexible access to lifelong learning, higher education and training, and productive employment.

The FET college sector was identified as a sector that is not suited to its purpose (Akoojee, et al. 2008, Kraak and Hall 1999, RSA DoE 2001). Some of the then Technical Colleges were located far from the economic centres. The policy development for the then Technical Colleges resulted in the promulgation of the Further Education and Training Act, number 98 RSA, 1998).

The results of the FET Act led to the New Institutional Landscape (RSA DoE 2001) which suggested the merger of 150 Technical Colleges into 50 new FET Colleges. FET Colleges were expected to provide skills that would be geared to the economic development of the country. Since 2004 the FET sector has received more attention from the highest levels of the national government. In the National Skills Development Strategy argued for the role of FET Colleges in the delivery of skills (RSA DoL).

The skills development agenda and the role of FET Colleges within the National Skills Development Strategy have been boosted by the introduction of the Accelerated and Shared Growth Initiative for South Africa (AsgiSA). The Joint Initiative on Priority Skills Acquisition (JIPSA), which is the key skills development component of AsgiSA, highlighted the importance of skills development and also the role of FET Colleges in responding to the key skills shortage in the country (McGrath and Akoojee 2007:8).

The overhaul of the FET Curriculum in 2007 led to the injection of 1,9 billion rand to revitalise the FET colleges (Young 2006:s.a).

2.4 THE NATIONAL CERTIFICATE (VOCATIONAL) (NC(V)) CURRICULUM

Although the focus of this study is on determining the appropriateness of the NATED programme which will be phased out by the end of 2009, it is important to take cognisance of the NC(V) programme which was phased in at the beginning of 2007.

In table 2.1 the differences between the NATED programme and the new NC(V) programme are explained .

TABLE 2.1: Differences between the NATED and NC(V) programmes.

NATED PROGRAMME 1984-2006 (N1-N6)	NCV PROGRAMME 2007 (NQF level 2-4)
1. Content based learning.	1. Outcomes based learning.
2. Exam oriented assessment.	2. Continuous assessment.
3. Passive students.	3. Active students.
4. Content based.	4. Integration of knowledge and connected to real life.
5. Text book focussed and teacher centred.	5. Learner centred and a teacher facilitated.
6. Rigid timeframes.	6. Flexible timeframes- learners at their own pace.
7. Course duration is six months for Business Studies and three months for Engineering Studies.	7. Course duration is one year per NQF level
8. No bursary scheme available	8. Financial assistance is available for all enrolled students.
9. Full qualification is obtained at each level and each level is an exit level.	9. Qualification is obtained after completing N4-N6 theory and eighteen months practical in Business Studies. Full qualification is obtained after completing N6 theory and two years practical training in Engineering Studies.

Source: Adapted from ORBIT FET Colleges 2007:6

In January 2007, the National Certificate (Vocational) NC(V) replaced the National Accredited Programmes of the department of education (NATED) courses (N1-N3) at public FET Colleges. The National Certificate (Vocational) NC(V) is a new qualification at levels two, three and four of the National Qualification Framework

(NQF). This NC(V) (Vocational) was introduced in FET Colleges at NQF Level two in 2007; Level three in 2008, and Level four were be introduced in 2009. After successfully completing levels 2-4, the student will obtain the National Vocational Further Education and Training Certificate. This certificate will replace the NATED certificate.

The NC(V) programme provides grade 9 students with a vocational alternative to an academic Grade 10-12 by offering industry focused training on the NQF levels two to four. These qualifications are designed to provide both theory and practice. The practical component of study may be offered in a real workplace environment or in a simulated workplace environment. It will provide students with an opportunity to experience work situations during the period of the study. The qualification will also provide an opportunity to enter the higher education environment, subject to an appropriate subject combination. The National Certificate (Vocational) will specialise in the following thirteen fields (Sunday Times 13 May 2007:2):

- Five engineering programmes, for example, electrical infrastructure construction, civil engineering and construction and engineering and related design.
- Finance, economics and accounting, marketing, management, Office administration, Information technology, Tourism, Hospitality studies and Primary agriculture.

Outlined plans to develop a new FET curriculum in the thirteen critical fields as outlined above were identified by the (AsgiSA) Accelerate and Shared Growth Initiative for South Africa, task team, together with organised business and labour (HSRC Human Science Research Council 2006).

The National Certificate (Vocational) is based on Outcomes- based Education (OBE) principles. Each year leads to National Qualification Framework (NQF) qualification, and after three years a successful learner will achieve a vocational qualification at

NQF level four. Each qualification is registered on the NQF which is administered by the South African Qualifications Authority (SAQA). The new curriculum consists of three components of learning, namely fundamentals, core and elective.

The new programmes offered at the colleges are designed to train students adequately for satisfying and fulfilling workplace requirements as required in the vocational business fields (Motheo FET College 2002-2009 of 5). These new programmes will also advance the strategic priorities determined by the national policy objectives and complement the Skills Development Strategy in collaboration with the Department of Labour. Of the thirteen critical fields identified, the Ezibeleni Engineering Campus is offering Civil engineering and construction, Electrical infrastructure construction, Engineering and related design and Fundamentals.

2.4.1 CHALLENGES IN THE IMPLEMENTATION OF NC(V)

The FET Act (RSA 1998) determined that the college staff was to be appointed from the educators post staff establishment, funded and created by the Member of the Executive Committee (MEC) at provincial level. The latest challenges posed by the FET Act (RSA 2006:26) have brought considerable changes to the above situation. This Act indicates that the college council is responsible for the appointment and funding of all college staff except management (principal and vice principal), whereas with the NATED programmes educators were employed by the state.

This has posed a challenge to the educators because the college council appears not to have a capacity in this regard and that has caused the majority of qualified educators to leave FET colleges and remain with the state rather than be employed by the college council. Many lectures that have been recruited by the college to replace those that have left have no teaching experience and more over they are not artisans, as required by the new programmes.

Many of the lecturers that have remained with the college have previously offered only theoretical courses and are unfamiliar with the practical component of the curriculum. Some of the lecturers seem uncomfortable with all the theory that is now required in the NC(V) curriculum. What makes the challenge even more complex is that many lecturers are reluctant to attend training and development sessions after hours. A key question is whether these educators will be able to educate the students to be work-ready after they have graduated (Van Rooyen (2009:s.a.)).

The admission requirement laid down by the National Department of Education for NC(V), which is Grade 9, poses a challenge because grade 9 does not have an exit certificate to testifying that the student is competent to be admitted to NC(V). Many of these students are young and unable to read and write, especially those coming from schools that are in rural areas.

According to a study conducted by Els (2009:54) at a FET college, students cannot read properly. They find it difficult to construct sentences and special words correctly. Students understand verbal instructions better than written instructions. However, the imperative reality facing FET colleges is that they have committed themselves to implement work readiness programmes that will respond to the needs of industry.

It is anticipated that the pool of NC(V) graduates will be a vital resource to enable business to address intermediate skills. NC(V) graduates will still require workplace experience, this means that they will be able to qualify as artisans after a period of time. However, this means that after NQF level 4 the student cannot be self-employed and there is no job guarantee for N(CV) graduates.

Work placement after graduation will depend whether the college has links or partnerships with industry, which is not the case regarding the Ezibeleni Engineering campus. This suggests that the

Ezibeleni Engineering Campus should consider ways in which relations with industry can be maximised Meyer and Taylor (2003 s.a). If an industry has decided that a partnership with an FET College makes sense, the questions that arise include:

- Which are the areas of the curriculum that the industry should focus on?
- What are the challenges that the industry may experience?
- What learning areas, skills and experience have been gained by the students that will enable the industry to implement this partnership as effectively and efficiently as possible?
- Are educators artisans or not?

The challenge that industry will confront in establishing these partnerships is to ensure that the NC(V) curriculum will provide students with the skills that they will require in the workplace. Experience of previous partnerships suggests that it is crucial that industry collaborate with the FET College to review the curriculum to ensure that it is in line with what they require as industry Seddon and Billet 2004 s.a). A further challenge is the active participation of industry in the governance structures within the college so as to inform and support the strategic processes of the college.

A crucial basis for curriculum development for the formal and informal sector is an acknowledgement and a realisation of theory and practice in FET institutions. This should not only concern the national economy, but also the global economy.

2.4.2 THE NATED CURRICULUM VERSUS THE ECONOMY

It would be the task of FET to train students to acquire the necessary skills required in South Africa (Akoojee and McGrath 2008). Vocational education and training is the primary manner through which the economic success of any country is determined. The government and the policy makers should view vocational education and training as a central feature that will enable the South African workforce to be proactively engaged in a competitive global economy. The need is to produce learners with knowledge, skills and attitudes that are more flexible, because skilled labour is the basis of any economy. Labour is the source of productivity and competitiveness in the economy (Gamble 2003:14).

There is a growing demand for more skilled labour per unit of employment. An analysis of the South African labour force suggests a sharp decrease in the demand for unskilled labour and an increasing demand for more sophisticated skills. According to the Centre for Development and Enterprise (CDE), the root of the skills shortage lies deep within the country's education and training system. FET institutions are urged to pay more attention to training for the industrial sectors, which training is the key to export performance and economic growth, and in terms of the skills needed to maintain international competitiveness.

It is, therefore, argued that any consistent means of developing a strategy of modernisation and economic growth should focus, above all, on the development of the curricula at FET colleges. In this way sufficient potential talent would be tapped to meet the rapidly expanding need for highly qualified labour. Even though the idea of a longer period of general education is acknowledged, unemployment of the youth remains a problem throughout the country. This is despite the fact that young people do complete a full education with a recognised qualification (Bhora *et al* 2006: s.a.).

Given the current conditions of global economic competitiveness, it is incumbent on the Ezibeleni Engineering campus to develop both general and specific skills for global competitiveness. The requirement for the Ezibeleni Engineering campus is to offer quality education, which will equip students for the transition to adulthood and working life. Key vocational skills are problem solving, motivation to work and the capacity to continue learning. Industry should play an important part in curriculum development that will prepare students for the transition to the professional world. The Ezibeleni Engineering campus should see itself as an instrument to facilitate the transition to the workplace and should adapt its teaching and its curriculum accordingly (Gamble 2003:15).

2.4.3 THE EMPLOYER'S NEEDS

According to Cosser and Sehola (2009:15), students who receive training at FET colleges have a better chance of finding employment than learners fresh out of school. Despite the fact that FET colleges train students for employment, employers complain that FET institutions do not supply them with the skilled labour force that they require. There are also continual complaints about skills shortages in the country (Sunday Times 2007:7).

It is inappropriate to assume that the employer's needs are the same in different workplaces. It is, therefore, important to analyse the evidence regarding the employers' responses in an attempt to address their needs. This will assist FET institutions to include more suitable learning material into their vocational curriculum so as to respond to the employers' needs. In a review of research on education and training in the United Kingdom, Brown and Keep (1999 s.a.) refer to the distinction that is made between the core skills required at different organisational levels. These skills include, for example communication, the use of numbers,

information technology (IT) skills, teamwork and problem solving that is required in the professional world.

Employers in large, medium and small firms are asking for more trainable learners. They want to employ qualified learners with a sound general education, with literacy and numeracy skills, the ability to read and to follow simple instructions. Furthermore, to convey messages accurately, understand simple diagrams and be able to perform basic calculations Gamble (2003:19).

The Ezibeleni Engineering campus should look at the curriculum in terms of the employers' needs because they know best what type of skilled labour is required. It is clear that government has to respond to the market trends that include local and global demands, when determining the policy in regard to education and training. The FET should work in collaboration with employers to determine whether the curriculum is appropriate to meet the needs of industry. It is also important that prospective employers provide learners with workplace experience during their training (Pandor 2007).

2.4.4 PARTNERSHIPS AND LINKS

There is a demand for a closer link between FET institutions and industry. Links between FET institutions and employers are viewed as an effective way of making education more relevant. Partnerships and links will provide a particular mechanism for enhancing economic responsiveness to FET institutions (RSA DoE 2004:73).

Through partnerships and links, FET institutions will be able to locate themselves in the local labour market in order to generate additional revenue through the training of employed workers, develop the capacity of staff, enhance campus resources and provide access for learners to workplace opportunities. From the industry (employer) perspective, partnership with FET institutions

will increase employer satisfaction, quality and overall productivity levels (RSA DoE 2004:5).

At the same time, however, partnerships and links will potentially play a larger role in enhancing the contribution of the Ezibeleni Engineering campus to local social and economic development. Partnerships and links can also be a way of utilising employers and community members as mentors and advisers for learners, and of gaining industry input in curriculum development (OECD Organisation for Economic Co-operation and Development 2000:128-129). It is interesting to note that Brown and Keep (1999:s.a.) comment on the fact that industry and education partnerships are based in particular cultures. They emphasise the need to bring industry and education into a closer and direct partnership.

In Japan, schooling is expected to provide a traditional grounding in academic knowledge, with industry being responsible for work related skills and vocational knowledge in the workplace.

In the United Kingdom (UK), the idea of industry helping to design elements of the curriculum and teaching material, and influencing the ways in which teaching is undertaken, has been successful.

2.4.5 LINKING FET INSTITUTIONS TO THE WORKPLACE

Work experience is seen as important as it allows students to learn about the work at firsthand. In this process learners will benefit by work-related knowledge and skills and also the type of knowledge about the workplace that is not usually dealt with in the class room situation. Gamble (2003:23) is of the opinion that apprenticeship is the best known way of linking formal and workplace knowledge. In the absence of a training plan and strong apprenticeship traditions, short and longer work experience should increasingly be included in the formal curriculum on all levels at the Ezibeleni Engineering campus.

It is important to acknowledge that work experience may differ from industry to industry. Some learners may be provided with an opportunity to experience workplace problems at firsthand and allow them an opportunity to participate better in the real workplace situation (Gamble 2003:23).

2.4.6 THE DECLINE OF THE APPRENTICESHIP SYSTEM

Over the past centuries skills have been transferred by means of demonstration and also by means of structured experiment and practice. The discovery of gold and diamonds in the nineteenth century created a new demand for skills. Skilled personnel (artisans) were imported from Britain. In South Africa this triggered the need for the training of professionals such as engineers (RSA DoL 2001).

In South Africa there was separate legislation governing black South Africans and White South Africans. Black South Africans were not allowed to sign up as apprentices and they were given the status of tool 'boys' and later artisan aids. Only in 1981 black South Africans were allowed to enter into apprenticeships (RSA DoL 2001).

The apprenticeship system grew and was used to address the skills shortage that was experienced by South Africa. Vocational Education was developed to provide theory only. Technical Colleges were later introduced to offer theory in a more structured manner as part of the apprenticeship, which was the practical instruction offered by Industry. The focus of the apprenticeship was restricted to specific trades that were only offered by Technical Colleges. Students were allowed to register for three months with the College to do theory and after that went into industry for practical training for a period nine months.

Technical Colleges were providing NATED programmes which were a component of the apprenticeship. This was a requirement for an

individual to obtain Artisan status. The requirements for obtaining an artisan certificate were regulated by the Manpower Training Act of 1981. Access to the trade test and certification in a particular trade required completion of a specific N course, for example, N2 or N3. Due to the rural nature or location of the Ezibeleni Engineering Campus it was not in a position to offer the apprenticeship system (see 1.1).

The South African apprenticeship system failed to address the challenges of providing a bridge for young people to enter into the labour market. The Learnership system was introduced as an attempt to address the collapse of the apprenticeship system. The Minister of trade and Industry indicated that the apprenticeship system was being scrapped in favour of the Learnership system (Sunday Times April 30 2001).

2.4.7 FET COLLEGES AND THE ROLE OF LEARNERSHIPS

In the case of South Africa, a learnership is a Vocational Education and Training programme that cuts across the old apprenticeship system. Learnership combines theory and practice that culminate in a qualification that is registered with the South African Qualification Authority (SAQA). Learnerships were introduced through the Green Paper of the DoL, which also called into being the Sector Education and Training Authorities (SETA's).

Employers were to enter into a Learnership agreement with the students and the service provider which is an FET institution. In most cases employers provided the practical part of the Learnership and the FET Colleges the theoretical part of the total programme. In some cases the employers are able to offer both elements of the learnership.

In the learnership system SETA's are playing a critical role in evaluating the Workplace Skills Plans, and developing Sector Skills Plans, and registering and developing the Learnership.

SETA's also play a role in quality assurance in the training provision, managing and administering the levy received through training (Akoojee 2005:111).

Learnerships are an integrated approach through which the skills shortage is being addressed in the country. If the learnership is successfully completed the learner obtains a qualification that is nationally recognised. However, this does not suggest that there are no challenges that are experienced through the Learnerships system.

In Table 2.2 the difference between the apprenticeship and the learnership are explained.

Table 2.2: Difference between the apprenticeship and the learnership systems.

APPRENTICESHIP	LEARNERSHIP
1. Not unit standard based	1. Unit standard based
2. Governed by the Man Power Training Act	2. SAQA registered
3. Formal agreement between learner and employer	3. Formal agreement between learner, employer and training provider
4. A minimum of three years	4. A Minimum of one year
5. Not SETA driven	5. SETA driven

The above table illustrates the differences between the apprenticeship system and the learnership system. It further explains how each system is managed and the number of years required to complete each system.

2.4.8 FET ARTICULATION TO HIGHER EDUCATION

The Ezibeleni Engineering college system was directed at providing vocational training offering engineering studies. This training was covering three levels, namely N1-N3, which would allow learners to enter the labour market after completion Mbanguta 2007(2007 s.a). These levels were followed by three other tertiary levels: N4-N6. Students who completed grades 10-12 in general schooling were admitted to the lower level, starting from N1.

The programmes at the Ezibeleni Engineering Campus were organised differently, with N1-N3 covering one year (trimesters). There were no language courses at the Ezibeleni Engineering Campus. The focus at the campus was only on Mathematics, Engineering Science /Building Science, Drawing and a theory subject for each field. The industrial communication module was only available at pre-N1 level.

Graduates from the Ezibeleni Engineering campus were entering the job market at the lowest levels. The challenge here is that the employers did not require these graduates to develop vocational skills and to fill higher positions. Furthermore, it seems as if employers were not concerned about the linguistic skills of these graduates. The reason might be that the employers did not expect these graduates to write a report of any kind.

This really indicated that there was going to be a continuation of the past practices in relation to cheap labour. The challenge lay in how the lecturers should determine the language knowledge that the learners should possess. The only option was to determine language knowledge and skills by using syllabuses, text books and examination papers. This meant that Technical and Vocational language when developed should be developed within the context of Technical and Vocational education. FET lecturers needed to be made aware that technical and vocational education involves more.

Students need to be trained in communication so as to develop their linguistic skills.

It was against this background that FET colleges were identified as a sector that was not suited to its purpose (Akoojee 2008:7). After 1994 a new FET system that would be responsive to the needs of South Africans was established by the National Ministry of Education (RSA DoE 1998b:8). The intentions of the Department of Education were published in White Paper 4: 'A programme for the transformation of FET colleges. The purpose of transforming FET colleges was to make them responsive and effective so that they could meet the needs of the country.

The FET system that was envisaged was a system that should contribute to improve the lives of the South Africans in general (RSA,DoE 1998b:8). There were also other key role players that wanted the FET sector to change. The College Collaboration Fund (CCF) was established to undertake research into FET. This research was established to inform policy makers on issues that needed attention in the FET sector.

The College Collaboration Fund (CCF) commissioned the National Business Trust to research FET colleges. In 1998 the National Business Initiative (NBI) tabled a report which informed the policy makers about the FET. The National Task Team on Further Education (NTTFE) was established. The NTTFE was in turn changed into a National Committee on Further Education (NCFE). The purpose of NCFE was to investigate FET and to make recommendations to the National Ministry of Education.

The publication of report that informed the Green Paper on Further Education and Training resulted from the NCFE study (RSA,DoE 1998b:1). This was the first step in FET policy formulation. The Green Paper on Further Education and Training was the beginning of a policy development framework for FET in the country. It was

against this background that terms of reference for FET policy were set.

The Green Paper on Further Education and Training and the Education White Paper 4 which were released in April 1998 and 25 September 1998 respectively were informed by the NCFE recommendations (RSA,DoE 1998a: 1, RSA, DoE 1998b: 8). The years from 1996- 1998 were very important years in the FET sector because of the policy developments that were directly focusing on FET.

The report by the NCFE, the release of the Green Paper and the White Papers in Further Education and training, and also the report by NBI, played an important role in the transformation of FET. The policy development for FET was strengthened by the collaboration of the Department of Education and private industry. It therefore seems as if South Africa is following international trends in relation to policy development in FET.

According to the department of Education, these policies are aiming to build responsive FET colleges that will address the skills shortage (Akoojee 2005:110). The Department of Labour and the Department of Education support the skills development of the informal sector.

FET colleges were expected to be responsive to the needs of the local communities where they are placed because they would be in a better position to deliver better skills (Akoojee 2005:114). The merged institutions were expected to help boost the economic growth of the country (Pandor, 2007). The Ezibeleni Engineering Campus was also established out of the merger of technical colleges. The Ezibeleni Engineering Campus was expected to play an important role in the Accelerated and Shared Growth Initiative for SA (Asgisa). FET colleges were identified as key role players in achieving the human resource development skill priorities that are part of the Asgisa.

The NATED programmes offered by the FET colleges seemed not to be responsive to the skills challenge that South Africa faces, hence the new curriculum for FET colleges was developed in March 2005. The Department of Education has developed new programmes that are presently presented as National Certificate (Vocational) Qualifications.

These programmes are designed to train students to be able to meet employers' demands RSA DoE (2005). These programmes are also designed to complement the Skills Development Strategy in co-operation with the Department of Labour. The intention of the Department of Education is to ensure that young people see FET colleges as first-choice skill development opportunities.

The New curriculum National Certificate (Vocational) was phased in as From January 2007. The NATED programmes were phased out. The question that arises is the articulation of this new curriculum to Higher education. Without any doubt the first group of students to graduate with three year national vocational certificate at the end of 2009 will not be able to proceed to Higher education.

The reason for the above is a lack of clear articulation of the NC (V) to Higher education. A student who has enrolled for the new curriculum in 2007 expecting to go to a university will be facing a problem cited by Mail & Guardian (2009). The Principal of the Eastcape Midlands FET College in the Eastern Cape (Mbona) said, articulation of N(CV) to Higher education is central to FET discussions.

As the issue of articulation is now more urgent, FET colleges should engage the Higher education sector to discuss articulation. The first step is for Higher education to recognise the FET qualification, to extend FET Colleges' capacity in general, as well as to upgrade staff qualifications. Starting with this initiative will help the process to flow.

2.5 SUMMARY AND CONCLUDING REMARKS

It is argued that a future curriculum for Further Education and Training Institutions (FET) needs to be informed by an adequate perspective on curricula of the past. A historical perspective shows that, from its earliest beginnings, technical and vocational education included three forms of educational provision.

First, technical education referred to science instruction as found in general education, where it functions as a foundation for practical knowledge. Second, vocational education referred to forms of compensatory education, with a practical aim. Finally, industrial education focused on the imparting of skills in some form of handcraft.

Various viewpoints were put forward concerning how global and local economic markets relate to education and training. It was established that, despite the current emphasis of skills acquisition there are still significant labour opportunities for those with traditional qualifications. Lifelong learning has become the mantra of the future.

Links between FET colleges and industry are required to be stronger rather than weaker, in order to address the high level of skills shortages that exist in country.

The need for the training of artisans in South Africa was triggered by the discovery of gold. Technical colleges were introduced to offer theory while the practical part was offered by industry. The apprenticeship system failed in South Africa because it only focussed on specific subjects. The learnership was introduced in replacement of the apprenticeship.

The chapter also alludes to the articulation of National (Certificate Vocational) to Higher education. Challenges facing the New FET curriculum are highlighted.

This chapter provided a background to research in as far as the Further Education and Training Curriculum is concerned. For an FET institution to perform well it needs to develop its own curriculum research section that will be able to continuously advise the campus on curricular development and to develop a curriculum that will directly respond to the needs of industry.

In the following chapter the role of FET in preparation for employment will be discussed. The chapter will further discuss the contribution of FET towards small, medium and micro enterprise development. Professional development and qualifications of FET lecturers are also to be discussed as well as leadership, management and development in the FET sector.

CHAPTER 3

THE ROLE OF FET COLLEGES IN PREPARING STUDENTS FOR EMPLOYMENT

3.1 INTRODUCTION

Up to now FET graduates in South Africa have completed their programmes of study without having had access to practical on-the-job training (Kraak & Hall 1999:218, RSA DoE 2001:3-4). Work-based learning has, therefore, become not only a desirable but also an essential core element of FET college provision.

The implication for FET colleges is that they must increasingly take on the responsibility for arranging work placement for their learners. At the same time they should invest in opportunities that provide simulated activities, project-based learning and other experiential learning to close the gap between the college and the professional world.

FET colleges are expected to concentrate their efforts on forging external linkages that would assist them to be able to prepare their learners for self-employment. Legislation passed in South Africa has created an enabling environment that requires the FET colleges to provide education and training for self-employment (Gamble 2003:29).

3.2 POLICY CONCERNING SELF-EMPLOYMENT

With the refinement and improvement that have taken place in the policy environment, the role that small business can play in the generation of employment has been realised. These policy measures have been refined within the broader debates with the aim to alleviate poverty.

In reconstructing the economy and Further Education and Training there is a need for a concerted effort to create a bridge between Further Education and Training, business and industry. It is important to highlight the importance of FET institutions in establishing a curriculum that will support training towards self-employment.

Because of South Africa's skills shortage, investment in Further Education and Training is needed. The objectives of the National Skills Development Strategy of the Department of Labour are taking note of the people who are unskilled in the labour market. These objectives also include people in small-medium and micro-enterprises (SMME), who should remain in employment or self-employment (RSA DoE and DoL, 1997:s.a). The Green Paper on Further Education and Training (RSA DoE, 1998a) argues for an expanded, diversified and revitalised FET sector that provides for self-employment, small business, entrepreneurial and community development.

The Green Paper also suggests the need for the development of high-level skills, which are required in the manufacturing industry. The Human Resource Development (HRD) strategy for South Africa titled "Nation at Work for a Better life for all" (RSA DoE & DoL, 2002:s.a) also includes skills development for the SME sector under the strategic objective of increasing the participation of industry in lifelong learning. The policy framework that is in place enables FET institutions to prepare learners for self-employment and employability.

3.2.1 ARTICULATING WAYS FOR SELF-EMPLOYMENT

Enterprises in the formal sector in South Africa are not in a position to absorb the increasing demand for employment. FET colleges will have to train their learners so that they can make a living in the informal sector.

Further Education and Training (FET) in South Africa has become the term that is often associated with economic development, according to the United Nation Educational, Scientific and Cultural Organisation (UNESCO). In addition to this, FET colleges are seen as vehicles to address issues such as youth unemployment and the skills shortage in South Africa. According to Rwambulla (2003:179), the only way to reduce unemployment among the youth in the country is through self-employment. It is therefore suggested that FET institutions should train their learners to create opportunities themselves for self-employment.

The purpose of the NC(V) curriculum is to help the learners to acquire practical skills competence and experience that will necessitate them to create opportunities for self-employment (RSA, 2004/5:s.a). The NC(V) curriculum is intended to empower learners to acquire certain skills and understand the underpinning principles of the skills they acquire for self-employment and employability.

3.2.2 FET CURRICULUM IN PREPARATION FOR SELF-EMPLOYABILITY

At the curriculum level, preparation for employability requires a strong combination of theory and practice. FET institutions are supposed to focus more on practical training and on-the-job experiential training in preparation for both employment and self-employment. This should not be at the expense of theoretical education as this extends the ability of students to think as demanded by modern technology.

A strong combination of theory and practice may be a good idea for FET colleges, because many employers prefer skilled workers that are employable rather than in need of training. To prepare students for employability FET colleges require strong relations and partnerships with industries. If FET colleges focus on preparation for employability in the wider sense, they will need

to become more pro-active with regard to their staffs' skills development (McGrath 2003:147).

Some colleges already offer many of the courses required for employability, but not in the right combinations. Curriculum change is underway, driven by the requirements that suggest that colleges should shift to a standard base approach that is aligned with the NQF. Many have viewed this as an opportunity for curriculum renewal and a chance to get rid of a nationally administered curriculum, which does not adequately keep abreast of changes in knowledge and in workplace practice. A full qualification is made up of fundamental, core and elective components, and offers sufficient scope for the combination of subjects and courses to provide broad educational experience (Muller, 2001).

It has been noted that preparation for employability requires both general and vocational education and training. These two have to be done together. FET colleges, as educational institutions, will need to exploit their ability to be responsive in the area of short courses targeting local employers. At the moment the NQF is new and in many instances Sector Education and Training Authorities (SETAs) are giving the lead in terms of developing unit standards, with FET colleges following. With this background in mind, FET colleges need to get ahead and fit into the new dispensation, with out losing their educational base.

3.2.3 FUTURE FET CURRICULUM OUTLINED

The curriculum in FET colleges clearly requires preparing the learners for employability and self-employment. This is not an easy task because the implications of the inclusion of practical training and work experience in the curriculum remain a significant challenge. The historical overview in the previous chapters showed how the technical and vocational education and training curriculum developed.

The policy call is for FET colleges to be responsive to the need for a highly trained and innovative workforce, which is required for economic growth in the twenty-first century. It is also necessary for FET colleges to be responsive to local needs, by providing access to education and training to those who are excluded from the mainstream of the economy. It has been indicated in the previous chapters, that a curriculum that prepares learners for employability at any level of the economy must include both general and vocational components.

Vocational education and training on its own cannot succeed without sound general education at primary and secondary levels. Neither can vocational education on its own fulfil the promise of lifelong learning. A core curriculum of language, mathematics basic proficiency in information technology, and entrepreneurship that cuts across current vocational specialisation, is an obvious way of ensuring that general education is a component of a FET college curriculum that would lead to self-employment (Rwabulla 2003:179).

3.2.4 SKILLS REQUIRED FOR SELF-EMPLOYMENT

The relationship between industry and the FET colleges needs to be strengthened if these institutions are to focus on SME skills development RSA DoE (1998a). In line with this, the roles of the Department of Labour need to be clarified. The nature of this clarification does not differ significantly from broader economic and employer demand. FET colleges need to expand their curriculum in the direction of skills, creativity, theoretical knowledge that includes literacy, and numeracy and business skills, in preparing students for self-employment.

FET colleges should note that enterprise education should be a theme that is highly rated on their agenda. If enterprise education can be located in the core curriculum of FET institutions it can significantly contribute to the ability of

students responding more effectively to the economic changes of the country. On the other hand, enterprise education can be a way of making students more ambitious about their future DoE and DoL (2002). The requirement for FET colleges to prepare their students for the professional world that includes both employment and self-employment as possible, options seems to be challenging.

Entrepreneurship and small business management are currently included as subjects in a range of programmes offered in FET. However the question arises as to whether these subjects are sufficiently preparing the learners for starting a business enterprise. FET colleges are expected to contribute meaningfully to the preparation of learners for self-employment.

3.2.5 FET TOWARDS SME DEVELOPMENT

FET colleges should become involved in entrepreneurial education that broadly relates to self-employment. The first kind of preparation may be interpreted as a form of skills training for sustainable self-employment. This should later progress towards preparation for self-employment. Such training should actually contribute to the development of a sustainable business enterprise.

It has been argued that much can be done to promote enterprise education through positive activities (see 3.2.4). For Further Education and Training colleges to achieve this they need to pay more attention to career guidance. This approach will not only benefit students who are already registered in FET, it will also benefit out of school youth and school leavers. According to Gamble (2003:36), FET institutions have traditionally contributed to SME development in the trade skills area. Some of the successful entrepreneurs have acquired their technical competence in a formal setting in state aided technical colleges (King and Adam cited in Gamble (2003:36)).

Despite the current development in FET colleges, the increase in rate of unemployment poses a challenge to the country in general. For FET colleges to be able to address this challenge it is incumbent upon them to embark on intermediate skills training or in situations of self-employment. What is apparent is a need for FET institutions to develop an approach that will focus on the principles of demand-led training (Standing et al.1996:450). This does not suggest that FET colleges should shift their focus from their provisioning of the core curriculum to entrepreneurial education (see 3.2.4).

To ensure appropriate training for these new developments poses a challenge to FET institutions to adapt to a diversified curriculum that will suit the needs of learners. Theory and practice demand-led training is interpreted as important in responding to the employers' needs and is also training for employment and self-employment.

3.3 ENTREPRENEURIAL COMPETITIVENESS THROUGH LEARNING

The skills shortage and unemployment in South Africa are some of the socio-economic challenges requiring urgent attention from FET institutions. These challenges are mainly caused by the fact that most of the unemployed do not possess the skills that are required for self-employment Xulu (2001). FET institutions need to develop a curriculum that is going to make unemployed people acquire skills that will enable them to become self-employed.

The challenge that is facing FET institutions in this regard is to find ways of dealing with the above hard facts. Taking up this challenge will benefit school leavers and FET graduates so that they are able to gain skills that are required for self-employment and deal with their own challenges successfully. It is the responsibility of FET institutions to empower their students with entrepreneurial skills so that they are able to overcome whatever stand in their way to entrepreneurial success in regard to the

NC(V). One can argue that the former NATED programmes have failed to empower students with entrepreneurial skills.

FET institutions should train their learners to acquire skills that will make them produce marketable products. Learners from FET should obtain necessary business skills that will assist them to become self-employed and be able to run a viable small business. This means that the goals of FET institutions must be not only to train students for employment but also for self-employment.

According to Davies (1993:40), relevant education equips the learner to achieve to the best of his/her ability. Relevant education should ensure that all learners are suitably prepared for their areas of specialisation at the end of their schooling or graduation (Godwin 1990:94).

FET institutions should engage in partnerships with industry for job placement and mentoring in order to prepare their learners for self-employment. FET colleges are also well placed to prepare learners for niche self-employment in the SME sector. FET institutions should, therefore, make sure that they offer quality education that is relevant to the needs of the economy to close the gap created by the NATED programmes.

3.3.1 PROFESSIONAL DEVELOPMENT OF FET COLLEGE LECTURERS

Further Education and Training lecturers are at the centre of the transformation of FET curriculum. FET colleges have been faced with a variety of policy changes since 1994. The rationalisation and merging of 152 technical colleges in 2002 to 50 multi-site campuses, was intended to cater for wide a range of needs of those who seek employment and return to learning (RSA DoE 2001). This was followed by a major recapitalisation of colleges for infrastructural overhaul, development and phasing out of NATED programmes.

On the 31st of October 2007, FET college lecturers were required to transfer their contracts to the college councils. These changes required that FET College lectures develop new 'identities' and shift from being technical college lecturers to FET educators. This move from being traditional technical college lecturers to become FET educators requires support for them in a new approach as well as a range of professional development initiatives. It should be noted that the policies and legislations alone cannot drive the transformation agenda that is required; FET College lecturers are key agents in facilitating the transformation agenda.

A teaching qualification was previously not a prerequisite for technical college lecturers. Experience in industry and technical qualifications were accepted as a teaching qualification. The Ezibeleni engineering lecturers were also employed in terms of the above qualification, by the Eastern Cape Department of Education. National norms and standards specifically for FET College lecturers need to be established through a national policy. This should be designed to equip only lectures who are prepared to teach in FET colleges so that they can meet the challenges facing the evolving economy (RSA DoE 2009).

The policy framework should respond to the challenges and responsibilities faced by the FET college lecturers. It should focus on the current lecturers and should inspire those who are committed to achieve the required standards in the FET sector. The policy framework should clarify the vocational component of the FET educational system. It should also outline recruitment guidelines for FET college lecturers within the vocational perspective. The policy framework should ensure that lecturers are equipped with the required vocational skills so that they are able to meet teaching demands (RSA DoE 2009). It should enhance the performance and professional competence of FET college lecturers. The policy should focus on developing dedicated FET

lecturers that will provide high quality education and performance (RSA DoE 2009)

The Eastern Cape Department of Education required that FET College lecturers should obtain a teaching qualification that is relevant for school teachers (European Centre for the Development of Vocational Training 1990 (CEDEFOP). This qualification is not relevant for FET college lecturers because it is a general qualification for school teacher qualification. There is no framework of recognised qualifications for teaching in FET Colleges. Adapted versions of school teacher programmes based on norms and standards for school educators are offered by Universities of Technology.

FET lecturers in engineering fields have through the years been recruited from industry. Some of the lecturers with academic subjects such as language entered the FET College with a school teaching qualification and with no industry or practical experience. FET college lecturers have also acquired Assessor and Moderator qualifications offered by private service providers.

Some of the Higher education Institutions offer Diploma courses for FET College lecturers that were more vocational in context. However generally there is no uniformity as to how FET college lecturers are trained and prepared to address the skills shortage that is faced by South Africa. Furthermore FET college lecturers are not recognised as lecturers because of the lack of teaching qualification.

Currently Universities are offering training for FET college lecturers as an 'add on' general teaching qualification which is not relevant for training FET lecturers. FET College lecturers in some instances lack relevant and up to date practical work experience and knowledge of local labour market needs. A school teaching qualification is no guarantee that FET College lecturers teaching practical are trained to address the curriculum

challenges facing the transformation agenda of the FET sector. It is, therefore, necessary that the FET sector extend educators subject knowledge in technically demanding subjects, and a holistic approach to the development of specialised training for college educators should be instituted.

To make FET colleges lecturers more responsive in programme presentation they should be engaged in short courses that are linked to the labour market demands and trained differently from school teachers. According to Brown and Keep (1999) FET College lecturers should be engaged in accredited formal practical training that are informed by the input from industry. This will make FET college lecturers responsive to programme delivery and enable them to impart the required skills to their learners.

In addition, FET college lecturers need training or retraining in aspects such as:

- Programme design and development flowing from information gathered from industry.
- Practical training that is provided in simulated settings or on-site training that is provided by the industry.
- Research aspects that are developed through partnership with Higher education.
- Involvement in specific specialised training through partnerships with industry.

The above training will enable FET lecturers to be:

- Competent professionals who are abreast of programme development in the vocational sector.
- Able to design relevant vocational study material in conjunction with industry.

- Committed on issues of readiness in improving student performance.
- Specialised in vocational education and training.

3.3.2 QUALIFICATIONS FOR FET COLLEGE LECTURERS

The teaching professionalism of FET college lecturers is the key to driving the transformation and development of vocational education and training in South Africa. It is therefore a general prerequisite that any educator in the FET sector should be well qualified and have extensive knowledge of the FET sector.

Currently the following policies are relevant to the qualifications and employment of FET college lecturers.

- The general and Further Education and Training Quality Assurance Act (Act No.58 of 2001)
- The FET colleges Act, 2006 (Act No. 16 of 2006)
- The basic Conditions of Employment Act,1997 (Act No.75 of 1997)
- The South African Qualification Authority Act, 1995 (Act No.58 of 1995).
- The Higher education Act,1997 (Act No.101 of 1997)
- The labour relations Act,1995 (Act No.66 of 1995)
- The higher Education Qualification Framework, published in *Government Gazette* No.30353, 5 October 2007.

Lecturers in vocational education were drawn from industry. These lecturers had vocational qualifications and coupled with practical experience. Their main focus was to deliver engineering courses. Educational theory and pedagogy was acquired through course offered by Technikons by some of their lecturers.

In a study of Els (2009:72) it was found that lecturers are inadequately qualified regarding academic qualifications such as

teaching diplomas and degrees, and in respect of professional qualifications relevant to industry and related to trade. Els (2009:72) stated that if a lecturer is not qualified in a particular field, for example, the Electrical field (in engineering studies), the skills related to that specific field cannot be passed on to the student. The relevant training is required in the vocational subjects before these skills can be taught to students.

A policy framework that will determine the qualification of FET college lecturers is necessary. It should address the limited articulation arrangement that the lecturers have found themselves in, in terms of progressing along a formal educational career path. It is therefore suggested that the question of proper teaching qualifications for FET lecturers is addressed. The new development within the FET sector requires well-qualified lecturers, who will be able to respond to the challenges of the 21st century experienced by FET colleges. The envisaged policy framework should be able to guide the colleges in terms of staff recruitment.

Appropriately trained lecturers should specialise in their areas of teaching. The Department of Education should have attractive packages for FET college lecturers so as to minimise the challenge of educators exiting FET in favour of the private sector.

The policy framework should set out prerequisites that will be compulsory for FET College lecturers teaching the NC(V) programme. All FET college lecturers should have qualifications that are equated to higher education entrance requirements. College lecturers should be encouraged to undergo professional development related to their areas of specialisation.

Pathways that will allow FET lecturers to pursue further formal studies need to be developed. A curriculum that is vocationally based should be developed. This curriculum should be developed in

such a way it leads the college to higher education vocational training. The qualification should therefore be vocational in nature and it should clearly outline the role and responsibilities of the lecturer.

This implies that FET college lecturers should broaden the concept of responsiveness within the FET college context and environment in relation to the above. FET College lecturers have a considerable contribution to make in regard to FET institutions are led and managed for the above to happen.

3.3.3 LEADERSHIP, MANAGEMENT AND DEVELOPMENT IN FET COLLEGES

At the centre of the appropriateness of the curriculum at the Ezibeleni Engineering campus is the development of proper management systems and policies. The merger of Technical Colleges into Further Education and Training Institutions was not just a formal one. The merger was a transformation which encompasses the design of new programmes, which means that the college should be responsive in all respects.

The merged institutions should respond to the needs of the communities in which they are located and also to the needs of industry. Curriculum development should be shifted from the Department of Education to colleges. The institutions were merged so as to become centres of excellence. For the above to happen, an institutional management is required that will work together with industry, Sector Education and Training Authorities (SETAS) and Higher Education Institutions, to advance education and training programmes that will satisfy all stake holders (Nzimande 2009).

The managements of the FET institutions has a responsibility to ensure that it is fully participating in continuous transformation of the colleges. The FET Act No.16 (RSA 2006) has introduced some changes from the previous legislation. The Act gives powers to the college Councils to appoint the lecturing and administrative staff, but not the management. This seems also to have posed a

challenge to the entire FET sector because college council members have never trained in any Human Resources related matters.

The crucial issues of concern among the lecturers are as follows:

- Lack of management and Leadership skills among the management.
- A quality Assurance Management System not in place.
- In-active college management in curriculum and programme development.
- In ability of the college management to understand service delivery by the FET.
- Very little research into existing and potential areas of development.
- Inability to establish partnerships and, if established inability in managing them.

This clearly indicates that FET colleges are no longer low-key institutions. FET Institutions need managers that are aggressive and have an entrepreneurial marketing strategy that is required to draw students. FET college managers need to demonstrate skills that are required by industry, namely: strategic planning, swift response to new needs, and the ability to develop new programmes.

To achieve the objectives of the NC(V) curriculum FET management should involve all major role players within the system. The management has to create an environment that will allow lecturers to achieve organisational objectives. Management decisions should be based on the analysis of data. The FET college management should challenge their decision -making through benchmarking so as to make the college an institution of excellence.

3.4 SUMMARY AND CONCLUDING REMARKS

Further Education and Training colleges need to concentrate their efforts on forging external links with industries, which will assist them to be able to train their students for self-employment rather than employability. Such an approach is entirely understandable, because the campus is faced with the issue of relevance. The campus continues to overproduce graduates for formal sector employment.

It can therefore be concluded that there is a significant shortfall of entrepreneurial knowledge and skills as well as a demand for the evaluation of the curriculum at the Ezibeleni Engineering Campus (see 3.2.4). This chapter explains the role of FET in preparing the learners for self-employment.

FET educators are at the centre of the transformation of the curriculum. It was therefore crucial to indicate their professional development in this chapter. FET educators were not required to have a professional teaching qualification because they came largely from industry. The transformation processes that have been taking place in the FET sector require well-qualified and competent educators who will be able to impart the necessary skills to students.

The next chapter deals with the research methodology applied in this study. It starts with the purpose of the investigation and explains what the research design is and also explains the similarities and differences between the qualitative and quantitative research. The importance of combining the qualitative and the quantitative methods will also be explained in the following chapter.

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

In educational research, two research methods have been dominant during the past years, namely qualitative and quantitative research methods. According to Pring (2000:31), research in education has been primarily dominated by quantitative research, sometimes called the positivistic approach. Pring (2000:32) asserts that the quantitative research methodology is not able to 'capture' the human element sufficiently. It is difficult, complex and unpredictable to describe human feelings, attitudes and emotions without the involvement of a qualitative approach.

Qualitative research studies human action in its natural setting (Pring, 2000:32). The focus of this chapter is to outline the rationale for the methodology used in this study, which is primarily quantitative in nature, but enhanced by a qualitative approach.

4.2 THE PURPOSE OF THIS INVESTIGATION

The aim of the study was to evaluate the appropriateness of the curriculum at the Ezibeleni Engineering campus and to formulate guidelines to address the possible curriculum shortcomings as identified (see 1.4).

The above aim was realised by pursuing the following objectives (see 1.4), namely:

- To undertake a literature review on the background of FET colleges and the NATED curriculum.

- To review documents and policies to determine whether the engineering curriculum complies with national guidelines.
- To establish whether the curriculum is aligned to the professional world.
- To determine whether the curriculum links theory and practice.
- To identify shortcomings in the Engineering curriculum.
- To make recommendations on how to address these shortcomings.

For the objectives to be realised, the following subsidiary research questions were formulated (see 1.3):

- Does the NATED Engineering curriculum comply with the SAQA (South Africa National Qualifications Authority) guidelines?
- Is this Engineering curriculum aligned with the professional world?
- Does the NATED engineering curriculum link theory and practice?
- What are the identified shortcomings of the NATED curriculum at the Engineering campus?
- How can the shortcomings of this curriculum be addressed at the Engineering Studies campus?

4.3 RESEARCH DESIGN AND METHODOLOGY

Hammersley (1992:182) warns that the process of inquiry in science is the same whatever method is used, and that the retreat into paradigms may effectively stultify debate and hamper progress. According to McLeod (1994:89), a non-experimental study such as a perception survey may have either a qualitative or a quantitative nature.

According to Babbie and Mouton (2001:74), a research design is a blueprint drawn of by the researcher who is intending to conduct the research. It is a process of empirical testing to support or refute knowledge claims. Mouton (2001:55) says that a research design focuses on the end product, contains a research problem as

a point of departure, and focuses on the logic of research. Huysamen (1994:10) offers a closely related definition of design as 'the plan or blueprint according to which data are collected to investigate the research hypothesis or questions in the most economical manner'. In this study both qualitative and quantitative research were used, because the researcher was able to collect both types of data about one topic at the same time (Ivankova, Crewell and Clark 2007:266).

According to Berg (2001:3), qualitative research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things. Strauss and Corbin (1998:1-10) state that, unlike quantitative research, qualitative research is any type of research that produces findings not arrived at by statistical procedures or other means of quantification.

4.3.1 QUANTITATIVE RESEARCH

Quantitative research seeks explanations and predictions that will generalise to other persons. The reason is to establish, confirm or validate relationships and to develop generalisations that contribute to theory (Babbie and Mouton 2001:49). McMillan and Schumacher (2001:15) and Punch (2004:4), simplify the description of quantitative research as empirical research in which the data are in the form of numbers. It is indirect and abstract and treats experiences as similar, adding or multiplying them together, or "quantifying" them. In the quantitative methodology, the researcher tries to discover "truths" or generalisable cause-effect relationships (Denzin & Lincoln 2000:8).

4.3.2 QUALITATIVE RESEARCH

The philosophic cornerstone of qualitative methodology is its effort to describe and render understandable the world of subjective experience. Liebscher (1998:669) asserts that qualitative methods are appropriate when the phenomena under study

are complex, are social in nature, and do not lend themselves to quantification.

According to Babbie and Mouton (2001:53,270), qualitative research is research conducted in a natural setting, attempting to study human action from the insider's perspective. The goal of qualitative research is to describe and understand rather than to explain and predict human behaviour. Thus the focus of qualitative research is rather on the processes involved than on outcomes.

The emphasis, therefore, is on methods such as unstructured or semi-structured interviewing, participative observation and the use of personal documents that place the primary aim on in-depth ("thick") descriptions and understanding of action events. The research is often inductive in its approach, resulting in the generation of new hypotheses and theories. The qualitative researcher is also seen as the "main instrument" in the research process.

The procedural principles of qualitative research in higher education are best described by Redelinguys (2003:169). He states that qualitative inquiry in higher education rests upon the following four key procedural principles:

- The central research objective is to understand how to explain, predict, or control.
- True understanding, according to the qualitative approach in higher education, will be achieved if the researcher is the prime instrument for data collection.
- The research process will be conducted with an emphasis upon analytical induction, rather than through hypothesis testing.
- The search for understanding is heavily value-laden.

4.3.3 SIMILARITIES BETWEEN THE QUANTITATIVE AND QUALITATIVE RESEARCH

Distinctions between quantitative and qualitative research are not absolute. Researchers may combine quantitative and qualitative methods in a single study. This means that the different research paradigms may be used together. Although the two research approaches have various differences, some similarities also exist Blaxter, Hughes and Tight (2001:65). The researcher opted for a combination of these two methods in this study.

4.4 DIFFERENCES BETWEEN QUANTITATIVE AND QUALITATIVE RESEARCH

Differences between quantitative and qualitative research are highlighted in Table 4.1:

Table 4.1: The difference between quantitative and qualitative research

QUANTITATIVE RESEARCH	QUALITATIVE RESEARCH
Objective	Subjective
Outcomes-oriented	Process-oriented
Seeks the facts/causes of social phenomena	Concerned with understanding behaviour from actors' own frames of reference
Obtrusive and controlled measurement	Naturalist and uncontrolled observations
Removed from the data: the "outsider" perspective	Close to the data: the "insider" perspective
Ungrounded, verification-oriented, reductionism, hypothetical-deductive	Grounded, discovery-oriented, exploratory, expansionist, descriptive, inductive
Reliable: hard replicable data	Valid: real, rich, deep data
Generalisable: multicast studies	Ungeneralisable: single case studies
Particularist: assumes stable reality	Holistic: assumes a dynamic reality

(Source: Blaxter et al. 2001:23)

Pring (2000:55) states that the different ways in which researchers understand reality are possible, because there are stable and enduring features of reality and independency of researchers, which make such distinctions possible. This applies not simply to the physical world, but also to the social and

personal aspects thereof. The social and personal world of the individual is, however, more difficult to evaluate.

Most persons have predictable emotions and capabilities which make it possible, for certain purposes, to consider them the same from person to person and thus open to quantification. The qualitative investigation can clear the ground for the quantitative, and the qualitative investigation is suggestive of differences to be explored in a more interpretive mode. McMillan and Schumacher (2001:14-15) also note some distinctions between the quantitative and qualitative research within the research process. The sections below describe these differences, as depicted in Table 5.1 in more detail.

4.4.1 ASSUMPTIONS ABOUT THE WORLD

Quantitative research is usually based on what is called a "logical positivist" philosophy, which assumes that there are social facts with a single objective reality, separate from the feelings and beliefs of the individuals. Qualitative research, on the other hand, is based more on what is called an interpretivist "naturalistic-phenomenological" philosophy, which assumes that multiple realities are socially constructed through the individual attempting to make sense and collective definitions of the situation (McMillan & Schumacher 2001:15, Niewenhuis 2007:59). In this study the researcher followed an interpretivist-positivist paradigm with a combined qualitative and quantitative approach (see 1.7.1 (Maree 2007:289)).

4.4.2 PROTOTYPICAL STUDIES

The quantitative researcher usually employs experimental or correctional designs to reduce error, bias, and extraneous variables. Quantitative research also seeks to control for bias through design, as well as taking subjectivity in data analysis and interpretation into account. The prototypical qualitative

study of ongoing events is an ethnography, which helps readers understand the multiple construction of reality. Qualitative research also includes the prototypical study of past events in historical research, using analytical research techniques to reconstruct and understand the multiple realities of past events (McMillan and Schumacher 2001:16).

4.5 THE ROLE OF THE RESEARCHER IN THIS STUDY

According to Cherry (2000:55) and Babbie and Mouton (2001:293), the researcher is required to use himself/herself as the data-collecting instrument. The researcher should also make a decision as to how the observations will be conducted. Will the researcher be a non-participant (simple) observer, or a participant observer?

In this study the researcher distributed the questionnaire to the participants and explained to the academic staff how the questionnaire was to be filled in correctly. In the interview survey the researcher interviewed the participants according to an interview schedule.

During the investigation the researcher was an acting Campus Manager at the Ezibeleni Engineering Campus. In this sense the role of the researcher can be described as that of a participant observer.

4.5.1 OBJECTIVITY AND SUBJECTIVITY

Gage (1994:372) states that the ideals of quantitative research call for procedures that are public, and the use of precise definitions. The application of objectivity-seeking methods for data collection and analysis are replicable so that findings can be confirmed or disconfirmed. The results of quantitative research knowledge are useful for explaining, predicting, and controlling the effects of education.

In describing the differences between qualitative and quantitative research, Blaxter, et al. (2001:65) describe qualitative research as subjective, and quantitative research as objective (see table 4.1). However, this may be an oversimplification of describing qualitative and quantitative research. The term "objective" is briefly described as doing justice to the subject of study (Babbie & Mouton 2001:274). It is important to note that objectivity is both a procedure and a characteristic of sound research practices. McMillan and Schumacher (2001:11) state that to lay persons objectivity means being unbiased, open-minded, and not subjective. As a procedure, objectivity refers to data collection and analysis procedures from which only one meaning or interpretation can be made. Objectivity in qualitative (non-statistical) research means explicitness in the way the data were collected, categorised, reconstructed and interpreted. Objectivity thus refers to the quality of data produced by the procedures of collecting and analysing data and not to the researcher's personal characteristics. Although objectivity is important in research, it is more difficult to attain when human behaviour is assessed.

4.5.2 DISCIPLINED SUBJECTIVITY

Since the researcher was part of the environment (setting), context and social phenomena, the researcher had to remain objective during the data collection process, and therefore, had to maintain disciplined subjectivity (McMillan and Schumacher 2001:411).

4.5.3 COMBINING QUALITATIVE AND QUANTITATIVE RESEARCH

The best research design is a mixed method design that integrates qualitative and quantitative research. The researcher combines both these types of research approaches in order to supplement and enhance each other. Monnapula-Mapesela (2002:222) states that the conscious decision to combine the methods is brought about by the fact that a quantitative-qualitative continuum can be used if the researcher does not see the two methods as competitive.

According to Mouton (1996:38-39), the least complicated level of debate is whether a researcher can combine quantitative and qualitative research methods and techniques. There are numerous ways in which researchers combine techniques that are usually accepted as quantitative and qualitative. In this research triangulation was used as a method to combine the qualitative and quantitative methods (see 1.7.1, Devos 2005:361).

Many researchers would argue that the use of multiple methods and techniques is actually one of the best ways to improve the quality of research. Monnapula-Mapesela (2002:67) agrees with this when she points out that a researcher may use the approaches and techniques that represent different dimensions of the research process.

In this investigation, the researcher mixed and varied the usage of these techniques during the study. It is important to note that it is said to be up to the researcher, given his/her preferences, the resources available, constraints of the study, and the particular issues of the research, how he/she will conduct the research (Blaxter et al. 2001:67).

4.5.4 DATA COLLECTION TECHNIQUES FOR THIS STUDY

According to Punch (2000:174), researchers use multiple sources of data in order to study human behaviour. Several types of data collection might well be used in one project. For the purpose of this study data were collected by means of semi-structured interviews and a questionnaire survey that was distributed to the educators.

The researcher first requested permission to do the survey. The researcher then conducted semi-structured interviews with five academic staff members to determine their views. The completed questionnaires were collected after two weeks. The respondents were assured of complete anonymity.

4.6 SURVEY RESEARCH

Survey research in education is the method of collecting information by asking a set of preformulated questions in a predetermined sequence in a structured or semi-structured questionnaire or interview to a sample of individuals drawn so as to be representative of a defined population (Hulton, 1990:8 & Blaxter et al. 2001:77).

According to McMillan and Schumacher (2001:304) as well as Babbie and Mouton (2001:231), the investigator selects a sample of respondents and administers a questionnaire or conducts interviews to collect information. The data that are gathered are used to describe characteristics of a certain population. Surveys are used to learn about people's attitudes, beliefs, values, demographics, behaviour, opinions, habits, desires, ideas, as well as other types of information.

A survey design usually provides a quantitative or numeric description of some fraction of the population - the sample - through the data collection process of asking questions to people. This data collection, in turn, enables a researcher to generalise the findings from a sample of responses to a population (Creswell 1994:117). A survey can, however, also be qualitative in nature if semi-structured interviews are used to collect data, as the researcher did in this study.

4.6.1 QUESTIONNAIRES

The Likert scale requires respondents to indicate whether they agree or disagree with the statement. A Likert scale with four to seven categories was used namely: "strongly disagreed", "disagreed", "agreed" and "strongly agreed". A neutral or not applicable option was also included (Maree and Pieterse 2007:167). A questionnaire has a mission to accomplish its function in measurement (Oppenheim 1992:100). Although the

questionnaire is more often used in the quantitative research approach, Punch (2000:91) asserts that it could also be used in a qualitative research approach. According to Breakwell et al. (2000:158), one advantages of using a questionnaire is its apparent simplicity, its low cost as a method of data gathering, and the fact that it is easier to administer.

The questionnaire (see appendix B) in this study was presented to each respondent to maximise a more objective comparison of the results. Bless and Higson-Smith (1995:107-8) assert that questionnaires must satisfy a certain number of criteria, such as a set of questions with fixed wording and a sequence of presentation. Questionnaires encompass a variety of instruments in which the subject responds to written questions to elicit reaction, beliefs and attitudes. The researcher chooses a set of appropriate questions and asks the subject to answer them, usually in a form that asks the subject to check the response. It is a common technique for collecting data in educational research. However, the questionnaire is not necessarily easier than other techniques and should be employed carefully (McMillan and Schumacher 2001:40).

4.6.2 OPEN AND CLOSED QUESTION ITEMS

McMillan and Schumacher (2001:260-261) emphasise that closed questionnaire items (also called structured or selected responses) are items in which a respondent is provided with a list from which the respondent is asked to select an answer. These items, as opposed to open-ended items, are easy to process because of their uniformity in responses.

Mouton (2001:233) also mentions that closed items can be easily processed, depending on the researcher's structuring of responses. For example, if there is a category of "if other, specify", the item will not be easy to process. Breakwell, Hammond and Gife-Schaw, (2001:162), however, clarify that if this category is not

included, the researcher's list of responses may not include some information that is very important.

In defining an open-ended form item in a questionnaire or an interview, Reaves (1992:106), McMillan and Schumacher (2001:206), Breakwell et al. (2001:161) and Mouton (2001:233) attest to the viewpoint that open-ended questions give the respondent an opportunity to provide his or her own answers to the question.

According to Hay, Herselman, Mbokodi and Fourie (2000:41), open-ended questions are advantageous to research investigation in that they afford respondents the freedom to voice their thoughts freely and unencumbered. Furthermore, once the respondents understand the intent of the question, they respond accordingly.

4.6.3 INTERVIEWS

The other way of collecting data is by means of interviews. The most common approaches in respect interviewing are structured, unstructured and semi-structured (Cherry 2000:55). Babbie and Mouton (2001:289-293) and Oppenheim (1992:65, 67) also describe three basic types of interviews. The first type of interview is an open or explanatory interview which allows the objective of study to speak for itself rather than to provide the respondent with a battery of predetermined hypotheses-based questions.

The second type of interview is an in-depth individual interview. During in-depth interviews the researcher is not that interested in the content of the conversation, but rather in the process by which the content of the conversation has come into being. The third type of interview is focus group interviews. These interviews can be conducted by choosing eight to twelve respondents and placing them in a circle.

The researcher would then manage the focus group by interviewing the individuals, starting with any specific respondent. The

researcher could also conduct research by using a group discussion to determine the group's feelings about a certain aspect.

Redelinghuys (2003:172) states that an advantage of the interview in higher education is the opportunity it provides for a glance backward as well as forward (speculatively) in time. For the purpose of this study semi-structured interviews were conducted with five academic staff members, because the purpose was to obtain information of a qualitative nature from a predetermined and limited number of people regarding their perspectives on the engineering curriculum (Niewenhuis 2007:87).

4.6.4 SAMPLING

In this investigation fifteen staff members at the Ezibeleni Engineering campus was selected purposefully and not randomly. All the academic staff members of the campus were included in the sample, making the questionnaire a census of the academic staffs opinions at the campus.

Fifteen questionnaires were used and five interviews conducted with academic staff at Ezibeleni Engineering campus. The college and its academic staff were purposely and conveniently chosen as respondents. Purposeful sampling is useful in attitude and opinion surveys and is done to increase the utility of information obtained from small samples.

Purposeful sampling requires that information be obtained about variations among the subunits before the sample is chosen. The researcher searches for information through rich key informants, groups, places, or events to study. In other words, these samples are chosen because they are likely to be knowledgeable and informative about the phenomena the researcher is investigating. The power and logic of purposeful sampling is that it may yield many insights about the topic (Ary, Jacobs and Razavieh 2002:169; McMillan and Schumacher 2001:400-401).

4.6.5 PILOT STUDY

The term "pilot" study is used in two different ways in social science research. It refers to a so-called feasibility study, which is a "small scale version or trial runs done in preparation for the major study" (Polit, Beck and Hungler 2001:467). According to Bless and Higson-Smith (1995:155), a pilot study is "a small study conducted prior to a larger piece of research to determine whether the methodology, sampling, instruments and analysis are adequate and appropriate." Moreover, a pilot study can also be the pre-testing or "trying out" of a particular research instrument (Barker 1994:182-3). One of the advantages of conducting a pilot study is that it might give an advance warning as to where the main research problem could fail, where research protocols may not work, or are too complicated. In the words of De Vaus (1993:54): "Do not take the risk. Pilot test first."

In a pilot study the entire research procedure is carried out, including analysis of data collected, closely following the procedures planned for the main study. Pilot studies are carried out with fewer subjects than will be employed in the main study. For some pilot studies two or three subjects are sufficient and it is rarely necessary to include more than 20 subjects (Polit et al 2001:467, McMillan and Schumacher 2001:307).

The pilot study provides additional knowledge that leads to improved research (Polit et al 2001:467 and McMillan & Schumacher 2001:307).

In this investigation a pilot study was conducted with a group of five lecturers working at the Ezibeleni Engineering campus. These lecturers helped the researcher to change some of the ambiguous questions that appeared in the original questionnaire. The original questionnaire was, in fact, totally overhauled, based on the results of this pilot study.

4.6.6 ANALYSIS, INTERPRETATION AND REPORTING OF DATA

The interviews were analysed by means of the constant comparative method. Shank (2002:131) states that comparative methods allow for the comparison of incidents to one another where later incidents serve as feedback for categories and conclusions are drawn from earlier incidents. However, where incidents do not lend themselves to comparison with previous incidents, theoretical comparison is applied.

According to Creswell (1994:154) and McMillan and Schumacher (2001:463,) the process of qualitative data analysis is eclectic; there is no "right way" and the researcher should be comfortable making comparisons and contrasts within the data.

The closed questions in the questionnaire were analysed by counting responses and expressing them as percentages of the total number of responses.

4.7 ETHICAL CONSIDERATION

Ethical issues are defined as a set of accepted principles within a particular study that the researcher is engaged on. Ethical considerations in this study are applied for the purposes of confidentiality of the respondents or the participants (Maree and Westhuizen 2007:75).

4.7.1 TRUSTWORTHINESS OF THIS INVESTIGATION

The basic issue of trustworthiness is simple: How can an inquirer persuade his or her audience that, the findings of an inquiry are worth paying attention to or worth taking account of?

Babbie and Mouton (2001:276) describe reliability and validity of a qualitative study as the trustworthiness of research. They state that the basic issue of trustworthiness is to persuade the

audience that findings of an inquiry are worth paying attention to or worth taking account of. They also explain that the quantitative study cannot be considered valid unless it is credible. Similarly a qualitative study cannot be called transferable unless it is credible, and it cannot be deemed credible unless it is dependable (see 5.9.1; 5.9.2; 5.9.3).

McMillan and Schumacher (2001:11-12) maintain that, if research tests a theory, then further testing with other groups or in other settings could confirm or revise the theory. This would prove the reliability of research. If the study entails qualitative exploratory research that is supposed to propose theory, the proposed theory could be verified with designs using quantitative approaches. Some qualitative studies, however, provide descriptive understandings about relatively unique situations. These insights or understanding are extended, but not replicated, in subsequent research of different situations or historical areas for revision or confirmation. Qualitative research is thus not verified in the same manner as quantitative research.

TABLE 4.2: Quantitative and qualitative notions of trustworthiness.

Quantitative	Qualitative
Internal validity	Credibility
External validity	Transferability
Reliability	Dependability
Objectivity	Conformability

Source : (Babbie and Mouton 2001:276).

4.7.2 TRUSTWORTHINESS OF THE INTERVIEW SURVEY

The trustworthiness of the interview survey in this study is subsequently argued in terms of its credibility, transferability, dependability and conformability.

4.7.3 CREDIBILITY

Credibility concerns whether something seems to be true or not. In other words, whether there is compatibility between the constructed realities that exist in the minds of the respondents and those that are attributed to them. For the purpose of this study credibility was achieved through prolonged engagement and persistent observation (that is through a literature study, an initial interview survey, a pilot study and a questionnaire survey) of research methods (Babbie & Mouton 2001:276).

4.7.4 TRANSFERABILITY

Transferability refers to the extent to which the findings can be applied in other contexts or with other respondents. The qualitative researcher is not primarily interested in (statistical) generalisation. All observations are defined by the specific context in which they occur. The qualitative researcher therefore, does not maintain or claim that knowledge gained from one context will necessarily have relevance for other contexts or for the same context in other time frames.

Within the quantitative tradition, it is the obligation of the researcher to ensure that findings can be generalised from a sample to the target population, whereas in a qualitative study the obligation for demonstrating transferability rests on those who wish to apply it to the receiving context (Babbie & Mouton 2001:277). Findings cannot be transferred to another college but outcomes can be used for advice.

The following are conditions for transferability and were employed in this study:

- Detail: because transferability in a qualitative study depends on similarities between sending and receiving context, the researcher collects sufficiently detailed data in context and reports them, with sufficient detail and precision, to allow judgements about transferability to be made by the reader.
- Purposive sampling: in contrast to random sampling that is used in quantitative studies, qualitative research seeks to maximise the range of specific information that can be obtained from and about that context by purposely selecting locations, information and participants that may differ from one another (Babbie & Mouton 2001:277).

4.7.5 DEPENDABILITY

An inquiry must provide its audience with evidence that, if it were to be repeated with the same or similar respondents (subjects) in the same (or similar) context, its findings would be similar Babbie & Mouton (2001:278). The similarity of the findings from the interview survey and from the questionnaire survey in this study is evidence of the dependability of findings.

4.7.6 CONFIRMABILITY

Confirmability is the degree to which the findings are the product of the focus of the inquiry and not of the biases of the researcher. An adequate trail should be left to enable an auditor to determine if the conclusions and recommendations can be traced to their sources and if they are supported by the inquiry (Babbie & Mouton 2001:278). For this purpose the researcher kept all transcriptions of the interviews and they are available for audit purposes.

4.7.7 VALIDITY OF THE QUESTIONNAIRE SURVEY

According to McMillan and Schumacher (2001:239), validity is the extent to which inferences made on the basis of numerical scores are appropriate, meaningful and useful. Validity is the judgement of the appropriateness of measure for specific inferences or decisions that resulted from the scores that were generated. In other words, validity is a situation-specific concept.

Validity is assessed, depending on the purpose, population and environmental characteristics in which measurement takes place. A survey can therefore be valid in one situation and invalid in another. Bell and Bush (2000:104) define validity as the degree to which an item measures or describes what it is supposed to measure or describe. For this study, validation was established through a literature review pertaining to an evaluation of the curriculum, employing an initial interview survey and piloting the questionnaire.

The internal validity of a study is a judgement that is made concerning the confidence with which different possible factors can be ruled out as explanations for the results. It involves a deductive process in which the investigators must systematically examine how each of the possible factors or threats to internal validity may have influenced the results. Internal validity is rarely an all-or-none decision. Rather it is assessed as a matter of degree, depending on the plausibility of the explanation (McMillan and Schumacher 2001:326)

The internal validity of this investigation was possibly influenced by the following internal threats:

- History, whereby unplanned events occurred during the research, which affected the results. For example, in this investigation the researcher was affected due to the fact that most of the

academic staff were attending OBE training at the time the researcher was piloting the study.

External validity is the extent to which the results of an investigation can be generalised to the people and environmental conditions outside the context of the survey. That is, if the same survey was replicated with different subjects in a different setting, would the results be the same? In other words, what are the characteristics of subject and environmental conditions for which one can expect the same results (McMillan and Schumacher 2001:327).

The external validation of this investigation could have been influenced by the selection of subjects. Generalisation is limited to the subjects in the sample if subjects are not selected randomly from an identified population (McMillan and Schumacher 2001:328).

4.7.8 RELIABILITY OF THE QUESTIONNAIRE SURVEY

When referring to the reliability of the study, Maykut and Morehouse (2001:146) are of the opinion that it is the extent to which one can place confidence in the outcomes of the study. To ensure reliability in this study, the researcher briefed the participants about the necessity to carry out the research. Participants were also assured of anonymity in the presentation of findings.

In addition, the reliability of the questionnaire was put to the test by piloting. The reliability of the findings is also strengthened by the similarity of findings from the interview survey and from the questionnaire survey.

4.8 SUMMARY AND CONCLUDING REMARKS

This chapter was intended to indicate how the process of inquiry was conducted at the Ezibeleni Engineering campus. The researcher used both quantitative and qualitative methods of gathering information. The method of normative research whereby predetermined questions on a questionnaire were used was combined with the interpretive paradigm, using individual interviews and open-ended questions. The interviews were conducted to obtain an initial background and to fill the information gaps that might be left by the questionnaire survey.

In this chapter the focus was on the exposition of the quantitative and qualitative research methods, which were used in this survey. The researcher highlighted the differences and the similarities between the quantitative and the qualitative research methods. Data collection techniques, population sampling, analysis and interpretation procedures were also dealt with. The researcher used a survey approach because surveys are used to learn about people's attitudes, beliefs, values, demographics, behaviours, opinions, habits, desires, ideas, and other types of information. Accurate information can be obtained for a large group of people from a small sample. The researcher also argued the trustworthiness, validity, and reliability of the interview and the questionnaire survey, respectively.

In the next chapter the results of the interview and the questionnaire surveys are subsequently reported, interpreted and analysed.

CHAPTER FIVE

RESULTS AND FINDINGS OF THE EMPIRICAL STUDY

5.1 INTRODUCTION

The focus of this chapter is on describing the research process used in collecting the data as well as presenting the results obtained during this study. The first section starts by describing how data was collected. The instruments used for collecting data were mainly questionnaires and interviews. Most of the questions used in the questionnaire were closed questions, thus favouring a quantitative approach. However, some open-ended questions were also used in the questionnaire and therefore, required a qualitative approach for analysis.

5.2 RATIONALE AND CONTEXT OF THE EMPIRICAL STUDY

The purpose of the semi-structured interviews was to obtain information from the lecturers. One of the advantages of the semi-structured interview is that the researcher can obtain more relevant information from the respondent during an interview than via the questionnaire.

5.2.1 BACKGROUND TO THE EZIBELENI COLLEGE

The Ezibeleni Technical College was established in 1984 by the Transkei Government as a Technical College. The restructuring of the FET College sector began in late 2001, following the launch of the New Institutional Landscape for FET (see 1.1). The merging of 152 technical colleges into 50 FET colleges was undertaken across the country.

The legislation and subsequent policy implementation process driven by the Department of Education, sought to put in place an enabling environment for institutions from different historical

backgrounds to consolidate resources, overcome duplication and harness innovation. The Engineering campus is one of the Ikhala Public FET college campuses specialising in engineering.

This campus was named an Engineering Campus after the merger because of its specialisation in engineering. It was intended as a means for students to specialise in engineering and to offer programmes that would directly respond to the needs of the global economy. The Ezibeleni Engineering campus was offering NATED programmes that were trade based (see 2.2.2).

These programmes were designed to meet the needs of low-wage industry. The Ezibeleni engineering campus was offering NATED programmes from N1-N3 which led to N4-N6. These qualifications were not recognised by higher institutions. The Ezibeleni engineering campus was developed to provide theoretical learning alongside practical training. The practical training was offered by industry in the form of apprenticeships (see 2.2.5).

Technical colleges were categorised into three types of colleges prior 1994, namely: State aided colleges, Department of Education and Culture (DET) colleges and Homeland technical colleges.

The Ezibeleni Engineering campus was one of the previous Homeland Technical colleges. The Ezibeleni Engineering campus was identified as a campus that was not suited to its purpose (see 2.3.5). The reason was that the campus was located far from the economic centres. As a result of this the graduates from the Ezibeleni Engineering campus were entering the job market at a lower level (see 2.5.2).

The FET that was envisaged by the Department of Education was one that would contribute to the betterment of South African people. This led to the publication of the Green Paper on Further Education and Training. The Green Paper was informed by the recommendations presented by the National Committee on Further

Education. These policies were aimed at transforming the FET sector.

The Ezibeleni Engineering campus, as one of the merged institutions, was expected to respond to the needs of the local community in which it based. The intention was to ensure that FET is seen as a first choice by students.

5.2.2 A DESCRIPTION OF THE APPROPRIATENESS OF THE CURRICULUM

5.2.2.1 A PERCEPTION FROM THE LITERATURE

From the literature study on FET curriculum, documents indicate that for a Further Education and Training system to be successful it needs to offer diversified programmes that provides learners with knowledge, skills, attitudes and values that South Africans require as citizens (RSA DoE 1998a:14, see 2.2.1).

The documents also indicate that education and training is aimed directly at preparing students for the professional world. The curriculum should serve to define a useful purpose in terms of what the learners might do for living (see 2.3.4).

Documents further indicate that the FET institution should formulate guidelines that integrate academic, vocational education and theory and practice that will offer a flexible combination of fundamental, core and elective learning that is in line with the National Qualification Framework (NQF) (see 1.4).

5.2.2.2 PERCEPTIONS OF LECTURERS WHO WERE INTERVIEWED REGARDING THE APPROPRIATENESS OF THE CURRICULUM

The five lecturers that participated in the focus group discussion (see Appendix A) had different perceptions about the appropriateness of the curriculum, its development and its current implementation. Some (three out of five) lecturers even questioned

the communication between the DoE and the campus in as far as curriculum issues are concerned, because there was no communication between the campus and the DOE on curriculum issues. The lecturers noted the following points:

- Interviewees one, three and five were of the opinion that the engineering industry should not do away with apprenticeship (see 2.4.5).
- Interviewees two and five were not satisfied about the NATED curriculum because it does not link theory and practice (see 1.2).
- All five interviewees stated that the campus does not have a section for curriculum development (see 3.3.2).
- All the interviewees agreed that the NATED curriculum is not addressing language shortcomings (see 2.2.4).
- All the interviewees were of the opinion that the NATED curriculum is not responding to the needs of the local community (see 2.3.1).
- With regard to the NATED curriculum, all the interviewees stated that the current curriculum does not prepare the learners for employment (see 2.3.1).
- All the interviewees said that the curriculum does not prepare the learners for self-employment (see 3.2.5).
- All interviewees were of the opinion that the curriculum at the Ezibelini Engineering Campus is not appropriate (see 1.1).
- All the interviewees felt that there is no link between the campus and industry (2.4.5).
- All the interviewees agreed that the NATED curriculum does not develop students holistically (see 1.5).
- All the interviewees agreed that the NATED curriculum has shortcomings (1.1).

5.3 THE RESEARCH FINDINGS FROM THE QUESTIONNAIRE SURVEY

Of the 15 academic staff members at Ezibeleni engineering campus, 10 responded, giving a response rate of 67%. The data gathered were eventually expressed as a percentage of the total number of responses in each case, excluding those who selected a "Not applicable" category.

5.3.1 BIOGRAPHICAL INFORMATION OBTAINED FROM SECTION A OF THE QUESTIONNAIRE

In section A of the questionnaire biographical information was elicited about the lecturers who completed the questionnaires. The information included questions on the respondents' age, gender; current positions and years of employment at the Ezibeleni Engineering Campus (see Appendix B).

All the respondents (100%) indicated that they were members of the academic staff. The data indicated that forty percent (four out of ten) of the respondents had been employed at the campus for a period of between one to five years. Two of the respondents (20%) had been employed at the campus for a period of one to 10 years. Four of the respondents (40%) indicated that they had been employed at the campus for a period of one to 15 years.

Six out of ten of the respondents (60%) were between the ages of 25 and 32. Four the respondents (40%) were between the ages of 33 and 40. Seven of the respondents (70%) were males and the three (30%) were females. This means that there were more male than female lecturers. Eight out of ten of the respondents (80%) were lecturers and two (20%) were senior lectures.

Three of the respondents (30%) were from Mechanical engineering and three (30%) from Electrical respectively. Four respondents (40%) were from Civil.

5.3.2 ANALYSIS OF DATA OBTAINED FROM SECTIONS A, B, C AND D

Section B contained statements on the appropriateness of the curriculum at the Ezibeleni engineering campus. The respondents were asked to rate the statements according to a four-point Likert scale, ranging from "strongly disagree" to "strongly agree". Respondents also had a "not applicable" option if they felt the statement did not relate to their own experience. In each case the number of respondents was expressed as a percentage of the total number of responses (excluding the "not applicable" responses). The researcher also calculated the average rating for each of the statements. The results are summarised below (see Appendix C, section B):

5.3.3 APPROPRIATENESS OF THE CURRICULUM

In this question the researcher wanted to determine the opinion of the lecturers on the appropriateness of the curriculum (see Appendix B, Section B).

1. All the respondents (100%) strongly disagreed with the statement that the NATED curriculum is appropriate at the Ezibeleni Engineering Campus, indicating a considerable feeling of dissatisfaction with the curriculum (Question 1). The responses from the lecturers clearly indicate that there is a need to revise the curriculum at the Ezibeleni Engineering campus (see 1.1).

In the next question the researcher wanted to determine the understanding of the lecturers as far as the importance of industry is concerned in relation to apprenticeship.

2. Three (30%) of the respondents disagreed; two (20%) strongly disagreed with the statement that the industry should do away with apprenticeship (Question 2). One (10%) of the respondents felt that the question was not applicable.

Four (40%) of the respondents agreed or strongly agreed with the statement indicating that the students at the Ezibeleni engineering campus are not apprentices. Two (20%) of the respondents strongly disagreed with the statement that the Campus should try and develop links and partnerships with local industries to create interest in students in studying at the Ezibeleni engineering campus (see 2.5).

In question three lecturers had to indicate whether they regarded the NATED curriculum as appropriate for socio-economic development.

3. The majority (seven out of ten) of the respondents (70%) strongly agreed with the statement that the curriculum is not relevant to the learners for socio-economic development (Question 3). Two (20%) of the respondents agreed or strongly agreed and one (10%) disagreed with the statement. The seven respondents were saying that the NATED curriculum is outdated and it needs to be revised because it is with aligned to present socio-economic development of the country (see 2.4.2).

In question four the researcher wanted to determine whether the lecturers understand the role of the FET curriculum regarding the development students.

4. The majority (eight) of the respondents (80%) disagreed with the statement that the curriculum at the Ezibeleni Engineering Campus prepares students for employment (Question 4). Two (20%) of the respondents agreed or strongly agreed with the above statement.

A majority of eight (80%) of respondents indicated that the curriculum at the Ezibeleni Engineering campus does not include any practical training therefore it cannot prepare students for employment (see 2.4.5).

This 80% indicate that they understand the role of the curriculum in preparing students for self-employment.

In the following question the researcher wanted to determine the opinion of the lecturers on the preparation of students for self-employment.

5. All the respondents (100%) strongly disagreed with the statement that the present curriculum prepares the learners for self-employment (Question 5). All the respondents agreed that the curriculum at the Ezibeleni engineering campus is not designed to prepare students for self-employment, hence the Green Paper on Further Education and Training argues for an expanded, diversified and revitalised FET sector that will provide training for self-employment (see 3.2).

In the next question the researcher wanted the respondents to indicate whether the NATED curriculum articulates to higher education.

6. In response to the question on whether the curriculum at the Ezibeleni Engineering campus prepares the students to proceed to higher education, two (20%) of the respondents indicated that the question was not applicable, six (60%) of the respondents disagreed or strongly disagreed and two (20%) strongly agree with the statement.

Four (40%) responded that the curriculum does not allow the engineering learners to proceed to Higher education because the FET curriculum is very narrow and is not recognised by higher education (see 2.2.2).

In the following question lecturers had to indicate whether they agreed or did not agree regarding the responsiveness of the curriculum to the needs of the local community.

7. All the respondents (100%) strongly agreed that the current curriculum is not responsive to the needs of the community (Question 7).

All the lecturers are aware that the Ezibeleini engineering curriculum is not responsive to the needs of the community where the campus is located. For the curriculum to be responsive requires the campus to have closer links with industry. Partnerships and links will enable the campus to locate itself in the local labour market (see 2.4.4).

The responses of the lecturers with regard to unemployment of the youth are indicated in the next section.

8. The majority (80%) of the respondents disagreed with the statement that the NATED curriculum is addressing youth unemployment (Question 8). Two (20%) of the respondents agreed or strongly agreed with the statement.

The increasing number of unemployed youth is a matter of great concern, so it is imperative for the curriculum to shift away from the traditional divides between academic and applied learning and it is hoped that the NC(V) will be able to address this challenge (see 2.3.3).

In the following question the researcher wanted to know to what extent the lecturers had thought about the implementation of learnerships at the Ezibeleni engineering campus.

9. The majority (80%) of the respondents agreed with the statement that it is necessary to introduce learnerships at the Ezibeleni Engineering Campus (Question 9). One (10%) of the respondents strongly agreed and one (10%) disagreed with statement.

Eight (80%) of the respondents indicated that they understand the importance and the role of a learnership in FET

institutions. Learnerships combine theory and practice that culminate in a qualification. Learnerships were introduced through the Green Paper of the Department of Labour (See 2.2.7).

In the next question the researcher wanted to determine the perception of the lecturers in as far as the SAQA requirements in the FET curriculum are concerned.

10. Four of the respondents (40%) disagreed with the statement that the curriculum at the Ezibeleni Engineering campus complies with the seven critical outcomes accepted by SAQA (Question 10). One (10%) of the respondents indicated that the question was not applicable; three (30%) of the respondents strongly disagreed, and two (20%) agreed with the statement. The NATED curriculum at the Ezibeleni Engineering campus does not comply with SAQA (see 1.3.1).

In the next question the researcher wanted to determine whether the lecturers could identify shortcomings in the NATED curriculum offered by the Ezibeleni engineering campus.

11. The majority (90%) of the respondents agreed with the statement that the Ezibeleni Engineering has shortcomings because FET colleges were offering trade based curriculum that were very limited in content (Mbanguta 2002 s.a) (Question 11) (see 2.2.2). Only one (10%) of the respondents strongly agreed with the statement.

The FET sector is identified as a sector that is not suited to its purpose as cited by Akoojee, MacGrath and Visser 2008, Kraal and Hall 1999, RSA DoE 2001 (see 2.3.5).

In the next question lecturers had to respond to the question about the integration of theory and practice in the FET curriculum.

12. The majority (80%) of the respondents strongly disagreed with the statement that the curriculum integrates theory and practice (Question 12). Two (20%) of the respondents disagreed with the statement.

For an institution to be able to integrate theory and practice it should offer learnerships. FET institutions may enter into learnership agreement with employers and students. The FET colleges will offer theory and the practical part will be offered by the workplaces (see 2.5.1)

In this question the researcher wanted to know from the lecturers whether they agree or did not agree that the FET curriculum is supposed to provide learners with the knowledge, skills, values and attitudes necessary to respond to the demands of the global economy.

13. Six (60%) of the respondents disagreed with the statement that the roots of the skills shortage lie in the FET institutions (Question 13). Four (40%) of the respondents agreed or strongly agree with statement.

The analysis of the South African labour force indicates that there is a decrease in demand for unskilled labour and an increase in demand for sophisticated skills such as Information Technology (IT). According to the Centre for Development and Enterprise (CDE) the roots of skills shortage lie within the country's education and training system (see 2.4.2).

The next question the researcher asked the lecturers concerning the role of partnerships between the Ezibeleni engineering campus and industry.

14. All the respondents (100%) strongly agreed with the statement that a partnership with industry would provide a mechanism for enhancing the economic responsiveness of the Ezibeleni Engineering campus (Question 14). Linking FET institutions with

industry would make education and training more relevant. Partnerships with industry will enable FET institutions to respond to the demands of labour market needs (see 2.4.4)

In the next question the lecturers had to indicate whether the Ezibeleni Engineering campus is producing the required skilled students.

15. The majority (70%) of the respondents disagreed with the statement that the Ezibeleni Engineering campus produces students that have the required skills (Question 15) and three (30%) agreed with the statement.

Employers are complaining that FET colleges are not providing them with the skilled students. It therefore, the responsibility of FET colleges to revisit their curriculum in as far as skills training is concerned (see 2.4.3)

In this question the researcher wanted to know whether the Ezibeleni engineering campus produces graduates that are boosting the economic growth of the country.

16. The majority (70%) of the respondents disagreed with the statement that the campus is producing graduates that are boosting the economic growth of the country (Question 16). Three (30%) agreed or strongly agreed with the statement.

The Ezibeleni Engineering campus was established after the merger of technical colleges. Merged institutions were expected to be responsive and to assist in the economic growth of the country (see 2.2.5).

In the next question the researcher wanted to establish whether Ezibeleni Engineering Campus has inclusive training in as far as practical and work based training are concerned.

17. The majority (80%) of the respondents disagreed or strongly disagreed with the statement that the FET curriculum is inclusive of practical and work based training (Question 17). Two (20%) of the respondents agreed or strongly agreed with the statement. For the Ezibeleni engineering campus to have curriculum that is inclusive the campus needs to be in partnership with industry. Brown and Keep (1999: s.a) emphasise the need to bring industry and education into closer and direct partnership (see 2.4.4).

In the following question the researcher wanted to elicit responses from lecturers with regard to the work placement of students at the Ezibeleni Engineering campus.

18. All the respondents (100%) disagreed with the statement that the campus is arranging work placement for students (Question 18). Partnerships and links would enable the campus to be able to arrange work placement for students. Partnerships and links can assist in keeping the employers closer to FET and become advisers in the curriculum development Organisation for Economic Co-operation and Development (OECD) (2000:128-129) (see 2.4.4).

This question was posed to lecturers at the Ezibeleni engineering campus to determine what their responses would be to the statement on the importance of skills and whether skills are imparted to the engineering students.

19. The majority (80%) of the respondents disagreed or strongly disagreed with the statement that programmes and curriculum are ensuring that skills are imparted to Engineering students (Question 19). Two (20%) of the respondents agreed or strongly agreed with the statement. Vocational education and training is aimed at preparing the students to meet labour force needs and the curriculum should outline the training that the students

need to undergo to ensure that they will become employed or self-employed (see 3.2.1).

In the next question lecturers had to indicate whether they agreed or disagreed on the implementation of OBE at the Ezibeleni engineering campus.

20. Eight (80%) of the respondents strongly agreed with the statement that the implementation of OBE is being prepared for at the Ezibeleni Engineering campus (Question 20). Two (20%) of the respondents agreed or strongly agreed with the statement. The lecturers are aware that a shift had to be made from a teacher-centred approach to a student centred approach.

The lecturers had to indicate whether they agreed or disagreed that the campus is training of students for self-employment.

21. With regard to whether the students are trained for self-employment at the Ezibeleni engineering campus, the majority (70%) strongly disagreed and three (30%) disagreed with the statement that the campus is training students for self-employment.

It has been indicated in the previous chapters that a curriculum that prepares learners for employability at any level of the economy must include both general and vocational components (see 3.2.1).

In this question the researcher wanted to know whether the lecturers understand the characteristics of the curriculum at the Ezibeleni engineering campus.

22. The majority (90%) of the respondents strongly agreed with the statement that the NATED curriculum is characterised by fragmentation, poor co-ordination, inefficiency and in-equality (Question 22). One (10%) of the respondents agreed with the

above statement. As cited by Smuts in Gamble (2003:5), technical education originates from industrial and vocational education. Previously in South Africa technical and vocational education was determined by racial policies (see 2.2.1).

In the next question the researcher wanted to know from the Engineering lecturers whether the curriculum at the Ezibeleni engineering campus is supposed to expose students broadly to career development.

23. Seven (70%) of the respondents agreed or disagreed with the statement that the curriculum exposes the learners broadly to all aspects of career development (Question 23). One (10%) of the respondents felt that the question was not applicable and two (20%) disagreed with the statement. The curriculum should expose learners at the Ezibeleni engineering campus to all aspects of career development. The curriculum in the apartheid era should differ from the present curriculum (see 2.2).

The researcher included the next question in the questionnaire to determine whether the Ezibeleni engineering campus is a centre that integrates an approach to education and training.

24. The majority (50%) of the respondents disagreed with statement that the campus is a nucleus that integrates an approach to education and training (Question 24). One (10%) of the respondents strongly agreed and four (40%) agreed or strongly agreed with the statement.

Further Education and Training colleges should provide their learners with vital intermediate to higher level skill and competencies that the country needs. Further Education and Training institutions should place themselves in the centre of the education system that integrates an approach to education and training (see 2.1).

In the next question lecturers had to indicate whether they agreed or disagreed with the statement that the NATED curriculum is gender biased.

25. Seven (70%) of the respondents agreed with the statement that the NATED curriculum is gender biased (Question 25). Three (30%) of the respondents disagreed or strongly disagreed with the statement.

In the past technical and vocational education in South Africa was only made available to the white community and, more specifically, to white males. This was because of the opinion that the technical education was linked to manufacturing and industrial development (Gamble 2003: 7) (see 2.2.5).

The following question the researcher wanted to elicit responses from the lecturers on, was whether the curriculum at the Ezibeleni engineering campus is supposed to keep pace with globalisation and the patterns of modern life.

26. The majority (60%) of the respondents (60%) disagree with the statement that the current curriculum is not keeping sufficient pace with globalisation and patterns of modern life (Question 26). Four (40%) of the respondents strongly agreed with the statement.

Lecturers had to indicate their responses in this question by either agreeing or disagreeing that the NATED curriculum is not adequately aligned with the world of work.

27. Six (60%) of the respondents disagreed or strongly disagreed with the statement that the NATED curriculum at the campus is not adequately aligned with the professional world (Question 27). Four (40%) of the respondents strongly agreed with the statement.

The following question asked lecturers whether they agreed that students are trained to be mainly middle-level workers for a specific occupation.

28. The majority (80%) of the respondents agreed with the statement that the learners are taught to be middle-level workers for a specific occupation (Question 28). Two (20%) of the respondents strongly agreed with the above statement.

NATED programmes that were offered by FET colleges were trade based and narrow in content. These programmes were designed to meet the low-wage industries and they were not aligned with the economic trends of the country (see 2.2.2).

In as far as the importance of partnership with industry is concerned, lecturers had to indicate whether they agreed or not that the Ezibeleni engineering campus is engaged in partnerships.

29. The majority (90%) of the respondents disagreed or strongly disagreed with the statement that the campus is engaged in partnerships, and one (10%) agreed with the statement. There is a serious demand for FET to form closer links with industry. Partnerships with industry will create opportunities for students to be placed in work experience environments (see 2.4.4)

In the following question lecturers had to indicate whether they agreed or disagreed that the Ezibeleni engineering campus offers enterprise-based training.

30. All the respondents (100%) strongly disagreed with the statement that the campus is also focusing on enterprise education (Question 30). It was clear to all the respondents that the curriculum at the Ezibeleni Engineering Campus is not focusing on any enterprise education.

FET colleges should note that enterprise-based education should be a theme that is high on their agenda. Enterprise education can be located in the core curriculum of the FET (McGrath 2003:147 see 3.2.4).

In the next question lecturers had to indicate to what extent they agreed that the curriculum that is offered at the Ezibeleni engineering is narrowly focussed.

31. All the respondents (100%) agree with the statement that the curriculum at Ezibeleni Engineering Campus is too narrowly focused (Question 31). FET colleges in South Africa had been offering NATED programmes that were very narrow in content because they were design for low-wage industries and not aligned with the economic trends of the country (Mbanguta 2002 s.a. see 2.2.2

In the next question the lecturers had to indicate whether they agreed that the NATED curriculum failed to provide the skills needed.

32. The majority (50%) of the respondents disagreed with the statement that the NATED curriculum provides skills that are needed (Question 32). Five (50%) of the respondents strongly agreed with the above statement.

FET colleges are viewed as key institutions in educating and training students in relevant skills so that they can fully participate in the economy of the country (see 2.3.1).

The purpose of question 33 was to determine whether lecturers agreed or disagreed that students are given opportunities to develop their competencies on problem solving.

33. All the respondents (100%) disagreed or strongly disagreed with the statement that the students at the campus are given opportunities to develop their competencies in problem solving. The narrowly focused NATED programmes that were offered by FET colleges it made it impossible for students to be competitive in problem solving skills. The need for the development of an appropriate curriculum in a multilingual environment and students to be proficient in both English and Afrikaans is an important step that the campus should consider (see 2.2.4).

In the next question the researcher wanted to know whether the lecturers agreed or did not agree that the curriculum offered at the Ezibeleni engineering campus is outdated.

34. Eight (80%) of the respondents agreed or strongly agreed with the statement that the curriculum at the Ezibeleni Engineering campus is outdated (Question 34). Two (20%) of the respondents indicated that the question was not applicable.

The FET NATED programmes were narrow in content and not recognised by Higher education. It is therefore important for the Ezibeleni engineering campus to shift from the past and focus on the future curriculum (see 2.2.2).

The purpose of this question was to determine whether the Ezibeleni engineering lecturers agreed or did not agree that the curriculum at the Ezibeleni engineering campus is suitable for apprentices.

35. The majority (80%) of the respondents agreed with the statement that the curriculum at Ezibeleni Engineering Campus is suitable for apprentices (Question 35). Two of the respondents strongly agreed with the statement that the curriculum at the Ezibeleni engineering campus is suitable for the apprentices.

The NATED programmes were designed for apprentices. Due to the nature of the programmes, students were supposed to be on campus for a period of three months, and thereafter placed at a workplace in an apprenticeship for a period of nine months. (see 2.2.5).

In the next question it was stated that the curriculum does not make provision for language inadequacies, lecturers had to indicate to what extent they agreed with the statement.

36. The majority (60%) of the respondents agreed with the statement that the curriculum does not make provision for language inadequacies (Question 36). Four (40%) of the respondents strongly agreed with the above statement. Languages and communication were traditionally not regarded as an issue in the technical and vocational education curriculum. The experience has shown that in technical education language inadequacies and poor comprehension are among the biggest challenges faced by students (see 2.2.3).

In question 37 it was stated that the students at the Ezibeleni Engineering campus do not have the language skills to express themselves adequately.

37. The majority (70%) of the respondents agreed with the statement that the learners do not have the necessary language skills to express themselves (Question 37). Three (30%) of the respondents strongly agreed with the statement that learners at the Ezibeleni engineering campus do not have language skills to express themselves. Cosser (2003:53) indicated that the integration of previously disadvantaged black African students into former predominantly white schools in 1994 began to address the language problem (see 2.2.3).

In question 38 lecturers had to indicate to what extent do they agreed or did not agree that the NATED the curriculum at

the Ezibeleni engineering campus is adequately equipping the student to participate in the economy of the country.

38. Six (60%) of the respondents disagreed or strongly disagreed with the statement that the current curriculum is not adequately equipping the learners to participate in the economy of the country (Question 38). Four (40%) agreed with the statement. Six of the respondents disagree and two agreed with the statement that the curriculum at the Ezibeleni engineering campus is adequately equipping the learners to be able to fully participate in the economy of the country.

Vocational education and training is the primary manner in which the economic success of any country is determined. Developing a strategy of modernisation and economic growth should focus on the development of the curriculum (see 2.4.2).

In question 39 the researcher wanted to determine whether the lecturers agreed or disagreed with the statement that partnership with industry would increase employer satisfaction.

39. The majority (70%) of the respondents agreed with the statement that partnership with industry would increase employer satisfaction (Question 39). One (10%) of the respondents felt that the question was not applicable and three (30%) disagreed or strongly disagreed with the above statement. Closer links with industry will make Further education and Training more relevant. At the same time, partnership with industry would play a larger role in enhancing the contribution of industry to the curriculum development of the Ezibeleni engineering campus (see 2.4.4).

5.4 SUMMARY AND CONCLUDING REMARKS

This chapter focused on the presentation of the empirical results obtained from the interviews and the questionnaire survey done at the Ezibeleni Engineering campus. The researcher explained that the survey was mainly quantitative in nature, since the research instrument used in the survey was questionnaires containing many closed-ended questions. However, the questionnaire also contained a few open-ended questions. Furthermore, the interview survey was more qualitative in nature.

The chapter contained an analysis and interpretation of the research results. The aim of this study was to evaluate the appropriateness of the curriculum at the Ezibeleni Engineering Campus and to formulate guidelines to address possible shortcomings identified.

In the next chapter a conclusion will be drawn and recommendations for possible suggestions for the curriculum development at the Ezibeleni Engineering campus will be made.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

A successful Further Education and Training (FET) system will provide diversified programmes offering knowledge, skills, attitudes and values that South Africans require as individuals and citizens, as lifelong learners and as economically productive members of society. It will provide the access to higher-level skills and competencies that the country needs to chart its own course in the globally competitive world of the 21st century (RSA 1998a:14).

The Centre for Development and Enterprise argues that the roots of the skills shortages lie deep within the country's education and training system. This research shows that the Ezibeleni Engineering Campus has failed to deliver enough entrants to the training system with the core skills, attitudes and values on which to build workplace or self-employment skills. The Ezibeleni Engineering campus needs to define a better way of dealing with the curriculum and needs to do this with determination and haste.

This chapter includes the summary, conclusions, limitations and recommendations regarding the appropriateness of the NATED curriculum at the Ezibeleni Engineering Campus.

6.2 SUMMARY OF CHAPTERS

Chapter one provides a general introduction to the study. This includes a synopsis of the background to the problem. The problem to be investigated was stated, followed by identification of the focus of the study. The general aim, purpose of the study, study objectives, research questions and research problem were all stated. The research methodology applied to the study was outlined, key terms were defined and limitations to the study are stated.

A literature study on the NATED curriculum and the FET college sector, the language problem in FET, partnerships with the industry, policies concerning self-employment, NC(V), professional development of educators in FET and leadership, management and development in FET colleges were outlined in chapters two and three.

The fourth chapter described the research methodology and the process that the researcher followed to conduct the research.

In chapter five the researcher reported on the research findings that were derived from the interviews conducted with the lecturers as well as the responses obtained from the questionnaires.

In the sixth chapter the researcher summarised the results of the study and presented conclusions drawn from the study. Limitations and recommendations for additional research were also discussed.

6.2.1 PURPOSE OF THE STUDY

The main aim of this study was to evaluate the NATED curriculum at the Ezibeleni engineering campus of the Ikhala Public FET college to determine whether the curriculum is appropriate in preparing the students sufficiently for a career in engineering fields.

The research questions were answered by means of the literature reviews in chapters two and three of this dissertation. As well as by responses to the questionnaires and the interviews conducted with the staff of the Ezibeleni Engineering campus. The researcher therefore highlighted certain aspects of the FET curriculum as indicated in the literature study.

6.2.2 CONCLUSIONS

The research questions formulated in paragraph 1.3 and the objectives stated in 1.4 serve as the basis for drawing conclusions from the research undertaken.

The literature review in chapters two and three and the findings of this study suggested the following sources that would bring the curriculum more in line with the socio-economic demands (see, 2.3.4 and 5.3.2.1), namely:

- The students trained at FET colleges do not only require skills that are immediately applicable to work, but also a knowledge base that will enable them to adapt to new technologies.
- It was concluded that the NATED Engineering curriculum does not comply with the SAQA requirements. All the respondents in question 13 agreed with the statement that the Engineering curriculum is narrowly focussed (see 2.2.2 and 5.3.2.1).
- The researcher concluded that the curriculum at the Ezibeleni Engineering campus is not aligned to the professional world of work (see 2.4.4, 2.4.5 and 5.3.2.1).

- The curriculum should develop learners that will be able to respond to the demand of the industry (see 2.4.3).
- It was further concluded that the NATED Engineering curriculum does not link theory and practice (see 2.5.1 and 5.3.2.1). Realising that high unemployment rate is a problem in South Africa, the campus should not only produce learners that are employable, but also ones who are ready for self-employment (see 3.3).
- Students must possess a variety of skills so that they are qualified to adapt to the changing economy (see 2.2.2).
- Industries should revisit their employment structures to enable them to create new job opportunities (see 2.3.4).
- The researcher come to the conclusion that the NATED curriculum at the Ezibeleni Engineering campus has the following shortcomings:

The curriculum does not integrate theory and practice (see 2.5.1) and it is narrowly focused (see 2.2.2). A further shortcoming is that the curriculum does not articulate to higher education (see 2.4.8) and it does not have links with industry (see 2.4.4).

6.2.3 SKILLS REQUIRED FOR SELF-EMPLOYMENT

The literature on skills for self-employment was investigated in chapter three. It was stated that, as in other areas of the economy, globalisation has increased the emphasis on FET education and training institutions in SME development.

6.2.4 CONCLUSIONS DERIVED FROM EDUCATORS DURING THE INTERVIEWS

As far as the perception of educators is concerned, the following conclusions need to be highlighted (see 5.2.2.2)

It was concluded from the interviews that:

The industry should not do away with apprenticeship. The curriculum at the campus is not linking theory and practice. The NATED curriculum is not addressing language inadequacies.

6.2.5 THE FUTURE ENGINEERING CURRICULUM IN FET COLLEGES

The following priorities of curriculum development were identified from the literature and the empirical study to address shortcomings of the Engineering curriculum:

- A shift from national examinations to NQF compliant qualifications (see 2.1).
- The introduction of new programmes and study fields to make the curriculum more appropriate to the needs of the national economy and the local community where the campus is located.
- The NC(V) curriculum which was introduced in 2007 seems to have its own emerging problems, according to Els (2009:74), who is of the opinion that the transformation in the FET colleges is happening too rapidly to adjust properly.
- The design and introduction of learnerships in all fields with an optimal mix of theoretical knowledge, practical skills and exposure to workplace application.
- The inclusion of bridging courses and qualifications in the curriculum that will enable the learners to overcome barriers to further learning resulting from inadequate basic school education in key areas such as English, Mathematics and Science (see 2.2.3, 2.2.4, 2.3.5, 2.4.2).
- The inclusion of relevant general education components in the curriculum to provide learners with a good grounding in the key skills required by the employers, to prepare students for self-employment and employability (see 2.3.1, 3.2.1, 3.2.2, 3.2.4 and 5.3.2.1).

6.2.6 GENERAL CONCLUSIONS

FET colleges are often admonished to be more responsive to the needs of industry and commerce as well as more responsive to the needs of the local communities. This is indeed their curriculum task, but they cannot fulfil this task if they are not responsive on their own, as education institutions that serve the public good. Further Education and Training colleges owe it to themselves to build a strong and independent educational identity.

The Ezibeleni Engineering campus needs to develop a curriculum that is grounded in a set of values and principles that translate messages received from industry, commerce, employers and the broader community into educational language. This should be however, a start towards curriculum development that is not only responsive but also responsible in educational terms.

In general, the academic staff members expressed different perceptions about the curriculum itself. The researcher therefore concludes that the curriculum at the Ezibeleni Engineering campus needs attention hence the introduction of the NC(V) curriculum by the government.

6.2.7 LIMITATIONS

The following limitations of the study are acknowledged.

Although there are fifty FET colleges in South Africa and eight in the Eastern Cape, the study was limited to only one FET College in the Eastern Cape. It was also only the engineering campus that was covered. This is likely to affect the extent of generalisation. The ideal procedure would have been to include all FET colleges in the country.

However, due to financial and time constraints it was not possible to include all the FET colleges.

The study is limited only to the Ezibeleni Engineering campus and to the engineering lecturers. This has led to the exclusion of the business section of the Ikhala Public FET College and other FET institutions.

6.2.8 RECOMMENDATIONS FOR FUTURE RESEARCH

Follow-up research on the following issues regarding the appropriateness of the curriculum at this campus is recommended:

- A single curriculum framework that integrates academic and vocational education, and theory and practice.
- Curricula that will offer a flexible combination of fundamental, core and elective learning within the NQF.
- A curriculum that will prepare students for employment and self-employment.
- More research into vocational skills training at the FET colleges.
- Follow-up research on whether the new NC(V) curriculum is an improvement or not on the NATED curriculum.

6.3 CONCLUDING REMARKS

In this chapter the final conclusion and recommendations, based on the entire literature study as well as on the findings from the survey about the appropriateness of the curriculum at Ezibeleni engineering campus, have been discussed. The conclusions were based on research questions formulated in paragraphs 1.3 and 5.2 of this investigation. The researcher draws the conclusion that the curriculum at Ezibeleni Engineering campus has shortcomings. The general conclusion is that the curriculum at Ezibeleni engineering campus is outdated and inappropriate.

As far as recommendations for this study are concerned, the researcher formulated a variety of recommendations in as far as the following aspects are concerned, namely to:

Identify shortcomings in the NATED curriculum that will improve learner performance and achievement. To ensure that the curriculum complies with the outcomes accepted by SAQA so as to promote a curriculum that will integrate theory and practice. To promote curricula that will offer a flexible combination of fundamental, core and elective learning.

It is an undisputed fact that the NATED curriculum is beset by challenges. This situation is even worse at the Ezibeleni engineering campus. The curricula of FET institutions gradually have to move away from the old to the new. FET programmes have to be presented as first choice options for post grade 12 students.

Urgent attention should be given to the inclusion of practical and work-based training and simulated work experience. Programme and curriculum development has to pay attention to the balance of the core, fundamental and elective elements to ensure that generic and core skills are imparted. Urgent attention must be given to the impact of the introduction of learnerships to encourage self-employment. Issues relating to the medium of instruction need to be investigated to improve the competence of learners.

FET College's curricula should be more responsive to the needs of industry and commerce, as well as more responsive to the needs of local communities; this is indeed their curriculum task. A curriculum grounded in a set of principles that translate the messages received from industry, commerce, employers and the broader community into educational language and logic, is clearly not the only way of being responsive in curriculum terms. However, it can lead towards curriculum development that is not only responsive but also responsible in educational terms.

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APPENDIX A

INTERVIEW SCHEDULE FOR ACADEMIC STAFF AT EZIBELANI ENGINEERING CAMPUS

1. Do you think that the engineering industry has to do away with apprenticeship?
2. Does the curriculum link theory and practice?
3. Does the campus have a section for curriculum development?
4. Do you think that the current curriculum is addressing the language shortcomings?
5. Does the current curriculum respond to the needs of the local community?
6. Do you think that the current curriculum prepares students adequately for employment?
7. Does the current curriculum prepare students adequately for self-employment?
8. Is the curriculum appropriate at the Ezibeleni Engineering campus?
9. Does the campus have links with industry?
10. Does the present curriculum develop the learners holistically?
11. What are the shortcomings of the current curriculum in your opinion?

APPENDIX B

QUESTIONNAIRE SURVEY FOR THE ACADEMIC STAFF ON THE APPROPRIATENESS OF THE ENGINEERING CURRICULUM

This survey will assist the researcher in assessing the opinions of the academic staff in connection with the appropriateness of the engineering curriculum at the Ezibeleni Engineering campus.

The curriculum is defined as the planned and organised activities pupils experience in school. The concept includes the subject matter they are exposed to, as well as the methods of teaching and evaluation. These follow closely from aims and differing beliefs and values about the purpose of schooling and lead to the selection of different subject matter, teaching styles and modes of evaluation.

In this sense, the term curriculum should be understood to include everything that happens in a learning situation, broadly captured by Bernstein (IPET, 1994:s.a) as including content, pedagogy and evaluation. In other words, curriculum is as broad as encompassing all of the teaching and learning activities that take place in a learning institution.

INSTRUCTIONS FOR ANSWERING THE QUESTIONS

Please complete this questionnaire by either answering the questions in the space(s) provided or encircling the appropriate number or making a cross(x) in the appropriate box, for example:

2 or x (as applicable to the particular question)

Section A:

Personal and professional details.

As your response to the following questions is completely anonymous, it would very useful if you could provide the personal details.

1. For how many years have you worked at the Ezibeleni engineering campus? (Enter the number of years in the appropriate box)	
2. Which one of the following best describes your position? (Make a cross in the appropriate box) I am member of the academic staff. I am a member of the academic support staff.	
3. Indicate your age group making a cross in the appropriate box)	
25to 32 years	
33 to 40 years	
41 to 45 years	
46 to 50 years	
4. What is your gender? (Make a cross in the box)	
Male	
Female	
5. What is your post title? (Enter your title) (For example junior lecture or senior lecture)	

6. In which division are you? (For example electrical, civil or mechanical)	
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Section B:
Rating the appropriateness of the curriculum at the Ezibeleni Engineering Campus.
By making a cross (x) in the appropriate box, choose the expression which truly reflects your opinion of each of the 40 questions in the table below. Use the scale below to rate the items. Please respond to all items
0= not applicable
1= Strongly disagree 2= Disagree
3= Agree 4= Strongly agree

ITEM:	RATINGS:				
	0	1	2	3	4
1. The curriculum at the Ezibeleni engineering campus is appropriate.					
2. It is necessary for the Industry to do away with apprenticeship.					
3. The curriculum at the Ezibeleni engineering is relevant to the learners for socio-economic development.					
4. The curriculum at the Ezibeleni engineering campus develops the learners for employment.					
5. The curriculum at the Ezibeleni prepares the learners to be self-employed.					
6. The curriculum at the Ezibeleni Engineering develops the learners to proceed to higher education.					
7. The curriculum is responsive to the needs of the community.					

8. The curriculum at the Ezibeleni Engineering is addressing the youth unemployment.					
9. It is necessary to introduce learnership at the Ezibeleni Engineering Campus.					
10. There is collaboration between Ezibeleni engineering and the Department of Labour.					
11. The Ezibeleni Engineering campus is a campus that is suited for its purpose.					
12. The curriculum integrates theory and practice.					
13. The roots of the skills shortage lie deep within FET institutions.					
14. Partnership with industry will provide a mechanism for enhancing the economic responsiveness of the Ezibeleni Engineering Campus.					
15. The Ezibeleni Engineering campus is producing the required skilled learners.					
16. Students that are graduating at The Ezibeleni Engineering campus are boosting the economic growth of the country.					
17. The FET curriculum is inclusive of practical and work-based training.					
18. The Ezibeleni Engineering campus is arranging work placement for the students.					
19. Programmes and curriculum are ensuring that generic and core skills are imparted.					

20. Is the implementation of OBE being prepared for?					
21. The Ezibeleni Engineering campus is focusing on training the learners for self-employment.					
22. Do you agree that the current curriculum is characterised by fragmentation, poor co-ordination, inefficiency and inequality.					
23. The curriculum exposes students to the broad aspects of career development.					
24. The campus is a centre that integrates an approach to education and training.					
25. The current curriculum is gender biased.					
26. The current curriculum is not keeping sufficient pace with the globalisation and the patterns of modern life.					
27. Do you agree that the current curriculum at the campus is not adequately aligned with the world of work?					
28. Do you agree that learners are trained to be mainly middle-level workers for specific occupations?					
29. The campus is engaged in partnerships.					
30. The Ezibeleni Engineering campus is also offering enterprise education.					
31. Do you agree that the curriculum is too narrowly focused?					

32. Do you agree that the current curriculum fails to provide the skills needed?					
33. Students at the campus are given opportunities to develop their competences in problem solving.					
34. The curriculum is outdated.					
35. The curriculum is suitable for apprentices.					
36. The curriculum does not make provision for language shortcomings.					
37. Students do not have language skills to express themselves.					
38. The NATED curriculum is not adequately equipping students to participate in the economy of the country					
39. Partnership with industry will increase employer satisfaction.					

Please provide your own comments with regard to the aspects dealt with in section B in the space provided below:

APPENDIX C: THE SURVEY RESULTS

Appropriateness, of the curriculum: Survey results of the academic staffs opinions		
<p>This survey will assist the researcher in assessing the opinions of the academic staff in connection with the appropriateness of the curriculum at the Ezibeleni engineering campus.</p> <p>In this questionnaire we concentrate on the appropriateness of the curriculum at the Ezibeleni engineering campus.</p>		
<p>Instruction for answering the questions:</p> <p>Please complete this questionnaire by either answering the questions in the space(s) provided or encircling the appropriate number or making a cross (x) in the appropriate box, for example: (2) or (x) (as applicable to the particular question)</p>		
<p>Section A: Personal and professional details. While your responses to the following questions are completely anonymous, it would be very useful if you could provide the personal details requested.</p>		
<p>1. For how many years have you worked at the campus? (Enter the number of years in the appropriate box)</p>		
<p>The years of the employment of the respondents</p>		
Number of years employed	Total	%
1-5	4	40
1-10	2	20
1-15	4	40
	10	100
<p>2. Which one of the following describes you? (Make a cross in the appropriate box)</p>		<p>f %</p>

2.1 I am a member of the academic staff	15	100
2.2 I am a member of the academic support staff	0	0
2. In which age group are you?	f	%
25 to 32	6	60
33 to 40	4	40
	10	100
4. What is your gender? (Make a cross in the box)		
Female	3	30
Male	7	70
	10	100
5. What is your post title?		
The staff's current post title		
Current post title		
Lecturer	8	80
Senior lecturer	2	20
Campus manager	0	0
	10	100
6. In which division are you?		
Mechanical	3	30
Electrical	3	30
Civil	4	40
	10	100

Section B:

Rating of the appropriateness of the curriculum at the Ezibeleni engineering campus.

By making a cross (x) in the appropriate box, choose the expression (e.g. agree/ disagree), which truly reflects your opinion of each of the 40 items in the table below. Use the scale below to rate the items. Please respond to all items.

N/a = Not applicable

1 = Strongly disagree

2 = Disagree

3 = Agree

4 = Strongly agree

ITEMS:

RATINGS:

	N/A	1	2	3	4	Ave
1. The curriculum at the Ezibeleni engineering campus is appropriate.		10				100
2. Is it necessary for the industry to do away with apprenticeship?	1	2	3	3	1	30
3. The curriculum at the Ezibeleni Engineering Campus is relevant to students for socio-economic development?		1	1	1	7	70
4. The curriculum at the Ezibeleni engineering campus develops the learners for employment?			8	1	1	80
5. The curriculum at the Ezibeleni Engineering Campus develops the learners for self-employment?		10				100

6. The curriculum at the Ezibeleni Engineering develops the learners to proceed to higher education?	2	1	4	1	2	40
7. The curriculum is responsive to the needs of the community.					10	100
8. The curriculum at the Ezibeleni Engineering Campus is addressing youth unemployment.		8		1	1	80
9. Is it necessary to introduce learnerships at the Ezibeleni Engineering Campus?		1	1	8		80
10. There is collaboration between the Ezibeleni Engineering Campus and the Department of Labour.	1	2	4	2	1	2.2
11. The Ezibeleni engineering campus is a campus that is not suited for its purpose.	0	0	0	9	1	90
12. Does the curriculum integrate theory and practice?	0	0	2	0	8	20
13. The roots of the skill shortage lie deep within the FET institutions.	0	2	5	2	1	50
14. Partnership with industry will provide a mechanism for enhancing the economic responsiveness of the Ezibeleni Engineering Campus?	0	0	0	0	10	100
15. The Ezibeleni Engineering campus is producing the required skilled learners.	0	1	7	1	1	70

16. Learners that are graduating at the Ezibeleni Engineering campus are boosting the economic growth of the country.	0	1	6	1	1	60
17. Is the FET curriculum inclusive of practical and workbased training?	0	1	1	1	7	70
18. The Ezibeleni Engineering campus is arranging work placement for students.	0	0	10	0	0	100
19. Are programmes and curriculum ensuring that skills are imparted to Engineering students?	0	3	5	1	1	50
20. Is the implementation of OBE being prepared for at the Engineering Campus?	0	1	0	1	8	80
21. The Ezibeleni Engineering is focusing on training learners for self-employment.	0	7	3	0	0	70
22. The current curriculum is characterised by fragmentation, poor co-ordination, inefficiency and inequality?	0	0	0	1	9	90
23. Does the curriculum expose the learners broadly on all aspects of career development?	1	0	2	4	3	40
24. The campus is a centre that integrates an approach to education and training?	0	1	5	1	3	50
25. Is the current curriculum gender biased?	0	0	1	7	2	70

26. Is the current curriculum keeping sufficient pace with globalisation and patterns of modern life?	0	0	6	0	4	60
27. Is the current curriculum at the campus adequately aligned with the world of work?	0	2	4	0	4	40
28. Are students taught to be mainly middle level workers for specific situations?	0	0	0	8	2	80
29. Is the campus engaged in partnerships?	0	2	7	1	0	70
30. The Ezibeleni Engineering campus is also offering enterprise education.	0	10	0	0	0	10
31. Is the curriculum too narrowly focused?	0	0	0	5	5	50
32. Is the NATED curriculum providing the skills that are needed innovative approaches?	0	0	5	0	5	50
33. The learners at the campus are given opportunities to develop their competences in problem solving?	0	4	6	0	0	60
34. The curriculum is outdated	2	0	0	4	4	40
35. The curriculum is suitable for apprentices?	0	0	8	0	2	80
36. Does the curriculum make provision for language shortcomings?	0	0	6	0	4	60
37. Learners do not have language skills to express themselves.	0	0	7	0	3	2.38

38. The current curriculum is adequately equipping the learners to participate in the economy of the country?	0	5	3	2	0	50
39 Partnership with industry will increase employer satisfaction?	1	1	1	7	0	70

Please provide your own comments with regard to the aspects dealt with in section B in the space provided below:

- The curriculum is narrowly focused (4).
- The curriculum is not preparing students for employment (3).
- The curriculum is not preparing students for self-employment (2).
- The curriculum does not respond to the needs of the local community (3).
- There is no feedback whatsoever from examiners after exams (2).
- The curriculum does not assist students to proceed to higher education (1).
- The curriculum does not integrate theory and practice (4)
- The curriculum is not flexible (2).
- There is no urgent attention given to simulated work experience (3).
- The campus does not have any kind of partnerships

THANK YOU FOR YOUR ASSISTANCE.

YOUR CO-OPERATION IS HIGHLY APPRECIATED!