

Training and development opportunities for the Rigger Ropesman artisan in the Mining and Minerals industry

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Summary

The mining engineering world is continuously experiencing new challenges whether it is economically, technologically or socially, there will always be something new in sight.

Training and Development fulfils the role of the “breeder” of competence workforce and therefore it is essential to assure constant growth and progress within the skills and development environment. Personal attribute and dedication are the drivers of our success and achievements in our careers. The capacity of our trade and occupation does not set the limits and pace of our intensification to strive for the bigger and better in future. The career background and training and development opportunities are essential aspects to be renowned with before engaging with the learning intervention. Assure you start your career in the artisan trade that you desire to be a successful example in and discover the engineering world where the spectrum is never-ending.

Development opportunities exist for all, irrespective of the trade and occupation.

This study illustrates that even the smaller trade’s artisans as focused on in this study, namely the Rigger Ropesman, can achieve higher laurels if the energy and efforts are exploited in the applicable avenues. The starting blocks, must be the blocks that fit yourself as individual learner, if not, even the first steps in the career will be started in stumbling mode. This qualitative research design study discovered numerous persons who started a career without knowing what it entails. The Rigger Ropesman artisans, Engineering Foremen and Learners who were interviewed as the target group contributed to achieving the aim of the study. The aim of the study was the possible training and development opportunities for the Rigger Ropesman in the Mining and Minerals Sector. Future studies can be conducted on career guidance and training and development opportunities in other engineering trades as this study only focused on the Rigger Ropesman trade in the Mining and Minerals Sector.

Keywords

Artisan, apprenticeships, training, development, ratios, learnerships, skills needs analysis, scarce skills, trades and trade test.

Declaration of language edit

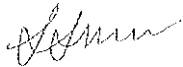
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ABBREVIATIONS

ATR	Annual Training Report
DHET	Department of Higher Education and Training
DOL	Department Of Labour
ESTC	Engineering Skills Training Centre
ETD	Education, Training and Development
ETDP	Education, Training and Development Practitioner
HR	Human Resource
HRD	Human Resource Development
MC&I	Measurement Control and Instrumentation
MERSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MMI	Mining Minerals Industry (In this study stated as the title topic and context in which the research is conducted)
MMS	Mining and Minerals Sector (In this study stated to when referring to the quotation out of the Mining Minerals Sector Skills Plan)
MQA	Mining Qualifications Authority
NAMB	National Artisan Moderation Body
NQF	National Qualifications Framework
OFO	Organising Framework Occupation
SAQA	South African Qualifications Authority
SDF	Skills Development Facilitator
SSP	Sector Skills Plan
WSP	Workplace Skills Plan

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CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

1.1. INTRODUCTION

The Mining Qualifications Authority (MQA) confirms the crucial impact of training and development's on the Mining and Minerals Sector and underlines the importance of skills improvement in the economic development of the sector. As stated in the MQA Sector Skills Plan (SSP) (2011: iii) for the period 2011 to 2016, such improvement will benefit employees in the workplace, their health and safety, their growth, and well-being in the sector.

Skills supply to the Mining and Minerals Sector can be categorised as follows: Firstly, there is the current available skills to the sector, which includes current employed workers in the sector. Secondly there is the flow of new skills into the sector, such as professionals, technicians and artisans. Lastly there are skills training and development in the work environment for miners and machine operators who undergo all their training and development within the mine.

The total employment number for the Mining and Minerals Sector at the end of 2009 was estimated at approximately 548,000 permanent employees and contracted employees. The occupational composition in 2009 indicated that managers constituted only 2% of the total employment. Professionals in non-line function areas such as accounting, financial management, human resources and information technology represented 14% of the workforce. Trade workers include artisans and artisan occupations that occur most frequently in the mining components of the Mining and Minerals Sector, for example: Electricians, Fitters, Plater/Boilermakers, Diesel Mechanics, Measurement Control and Instrumentation hereafter referred to as (MC&I) and Rigger Ropesman as stated in the MQA SSP (2011 xx).

The focus of this research will be to determine training and development opportunities for the engineering trade of Rigger Ropesman within the Mining and Minerals Sector. The researcher will also analyse the training and development ratios of other similar engineering trades and learnerships, for example Electrician, Fitter, Plater/Boilermaker, Diesel Mechanic and MC&I to establish possible training and development patterns as recorded in the Mining and Minerals Sector Skills Plan and company Workplace Skills Plans (WSP).

As confirmed in the MQA SSP (2011 xix), the Mining and Minerals Sector workforce comprise of several positions in various fields of expertise. The typical generic mine departmental structure consists of the following departments: Executive Management, Operational Management, Production Management, Human Resource Department, Finance Department, Mining Department and Engineering Department. The role of the engineering department in the mine could be summarised as one of the departments rendering a service of logistical support to the mining and or production departments, as part of the core business objective of the engineering department. The engineering department in Anglo American Platinum generally comprises of the following positions: Head of Engineering, Senior Principle Engineer, Manager Engineering, Residential Engineers, Sectional Engineers, Engineering Supervisors, Engineering Foremen, Artisans, Learners and Artisan Assistants.

In comparison to other trades, the training and development ratio of the Rigger Ropesman is questionable, since the researched reports do not provide clear guidelines regarding the number of persons to be trained and developed within the different artisan ratios. Chapter 2 will indicate the ratio difference in Anglo Platinum and in the MQA SSP, for the abovementioned artisan trades. Next the study will focus on the training and development of the Rigger Ropesman trade development opportunities.

1.2 ORIENTATION AND MOTIVATION FOR THIS STUDY

1.2.1 Orientation

The researcher is a Human Resource Development (HRD) Coordinator at the Engineering Skills Training Centre at Anglo American Platinum. The company is a platinum mining company with mines situated in North West and Mpumalanga provinces in South Africa. The Engineering Skills Training Centre provides training for Artisan Assistants, Learnerships, Junior Engineers, Engineering Foremen and Supervisors for the company. The training centre is the property of Anglo American Platinum and operates as a business unit generating additional income from external mining companies for which similar training are provided. The training is accredited by the MQA and MERSETA. The average loading in the training centre is ± 300 learners per day. The portfolio of experience of the researcher includes 9 years as a Rigger Ropesman artisan at Kloof Gold Mine. The researcher experienced 12 years as Rigger Ropesman Human Resource Development Officer and currently 3 years as Human Resource Development Coordinator at

Engineering Skills Training Centre (ESTC). This study will thus include the work environment of the researcher.

The researcher's orientation of 24 years' experience in liaison with other engineering trades as mentioned, confirms the link between different engineering trades. This inter linked association can be described as the engineering artisans who frequently work together as a unit in performing mutually dependent tasks. This simply underlines the artisans' dependence on one another's expertise to ensure the job is completed successfully.

1.2.2 Motivation

The Rigger Ropesman's expertise greatly impacts on jobs to be completed as it entails transporting, lifting, moving and positioning machinery and loads before or where-after the machine or load is connected and started-up for operational service by other engineering artisans. The responsible task of the Rigger Ropesman normally includes identifying and preventing safety and risk hazards and is predominantly complicated by the actions required to ensure that the Rigging operation is carried out as required by the specifications of the job at hand. The Rigger Ropesman's training and development is vitally important in the flow process of the engineering jobs to be performed on the mines.

In accordance with their **Workplace Skills Plan (WSP)** the individual mines plan for the training and development of artisan learnerships. The WSP provides the basis for identifying and planning skills development interventions as required by the company to support its strategic objectives and attain the individual training and development needs as noted by Meyer *et al.* (2007:63). The Human Resource Development Strategy for South Africa (2009:31) (HRD-SA) 2010-2030; Commitment One Strategic Priority 1.1 emphasises the objective "*to increase the annual output of artisan graduates through targeted artisan training*". The targeted output of qualified artisans forms part of the WSP of the company who is Anglo American Platinum in this study. The WSP is submitted to the Mining Qualifications Authority (MQA) annually, in compliance with the Skills Development Amendment Act 37 of 1998; Chapter 3.10.(1)a, b. as referred to in the **Sector Skills Plan (SSP)** for Mining and Minerals Sector for the period 2011-2016 Updated 31 August 2010, (2011:10.). The SSP is drafted for a 5 year term and is updated annually. This follows the submissions of the WSPs from the various companies registered with the specified SETA as confirmed in the Mining and Minerals Sector Skills Plan dated 16 February 2011 (2011:i, iii).

The Rigger Ropesman Artisan has also been classified as a critical scarce skill within the MQA Summary of demand for and supply of skills in the Sector as confirmed in the Mining and Minerals Sector Skills Plan for Mining and Minerals Sector 2005-2010 (Update 31 August 2009:45). The scarce skills are identified in the **Annual Training Reports** submitted by the mining companies to the MQA, in accordance with “*Functions of SETA*” stated as “*monitoring education and training in the sector*” in the Skills Development Amendment Act 37 of 1998; Chapter 3.10.(b)(iv). The findings of this study will contribute to the research of the MQA regarding scarce skills in the Mining and Minerals Sector; it will furthermore assist to upgrade and draft Human Resource Development (HRD) and Human Resource (HR) policies, as well as to develop guidelines for the appointment of learner ratios in the MQA.

The practical value of investigating reasons why mines experience these specific skills shortage will contribute to the skills needs analysis, recruitment and appointment of learners -- not only in this trade but also in other engineering trades. Having identified the scarce skills in the sector, priorities can then be drafted by determining whether the scarce or critical skills resort under core occupations in the sector.

1.3 PROBLEM STATEMENT

This section will look at the problem as core focus of the study. The main focus of the research will be to identify the training and development opportunities for the specific trade Rigger Ropesman. Factors influencing these opportunities will also be researched and why they are present in this specific trade. Mouton (2008:53) explains that research always involves information gathering and analysis, which could be in the format of data, documents, interviews, speeches, diaries, questionnaire responses and test scores. The research problem is “resolved” through “action” in the real world called World 1. From this approach the research problem is defined in the form of research questions. In following this format the research questions assist in formulating a clear research problem. The research questions below explore the research problem of this study by analysing the abovementioned forms of information gathered by the researcher. Typical key words for these research questions are: What, How, When, Which and Why. The researcher’s specific observations related to the research problem are the following:

- In communication with Rigger Ropesman learners it transpired that they are not sure what career opportunities there are for them when they become artisans.

- The culture amongst Rigger Ropesman artisans portrayed as “once a Rigger always a Rigger”
- The confidence of Rigger Ropesman learners reflecting doubtfully of their equal status in quality of training received in comparison with other engineering learners such as the Electrician, Fitter, Diesel Mechanic, MC & I, and Plater Boilermaker.

1.4 RESEARCH QUESTIONS

The researcher attempts to investigate possible training and development opportunities for the Rigger Ropesman in the Mining and Minerals Sector and to establish the differences between the Rigger Ropesman and other engineering learners in the Mining and Minerals Sector to answer to this research, the following three questions are posed:

- What are the training and development opportunities for a Rigger Ropesman learner and artisan in the Mining and Minerals Sector?
- To what extent does the training and development of Rigger Ropesman learners vary from the training and development of other similar engineering trades’ learners?
- If such a variance exists, what are the contributing factors?

The rationale of this research is to determine how the following questions affect the nature of the training and development of the said Rigger Ropesman learner:

- Which contributing factors cause possible variances when comparing the learners’ training and development to other similar engineering trades in Anglo Platinum and Mining and Minerals Sector?
- Are the training and development provided for the Rigger Ropesman learner of equal quality as the training and development provided to other similar engineering trades?
- Does the earning potential of other trades have a bearing on the selection of the Rigger Ropesman?

1.5 THE AIM OF THE RESEARCH

The aim of the research is to investigate

- possible training and development opportunities for the Rigger Ropesman as engineering artisan in the Mining and Minerals Sector; and to identify

- factors that influence the training and development of the Rigger Ropesman to vary from similar other engineering artisans engineering trades.

1.6 STUDY METHOD

The Qualitative research design method will be conducted in this study. In selecting the appropriate research design and methodology Mouton (2008:55) states that a research design is a plan or blueprint of how one would intend to conduct the research. De Vos *et al.* (2010: 269) argue that qualitative studies have a baffling choice of design due to several different approaches available to utilise. Creswell (2009:12) identifies five strategies of inquiry or traditions that may be used to design qualitative research:

1. Biography
2. Phenomenology
3. Grounded theory
4. Ethnography
5. Case study event

In this study the research will be shaped as a qualitative research case study as the training and development of the Rigger Ropesman portraits as a programme, event, or activity process of an individual trade in the Mining and Minerals Sector. The researcher will collect information utilising different data collection methods as affirmed by Creswell (2009:13).

Mouton (2008:144) is of the opinion that the focus of empirical study is to find and analyse existing data. This research will attempt to meet the differences in training and development opportunities in comparison with similar trades and will investigate it with a sensible interest to ensure that data is interpreted concerning the particulars of a qualitative study rather than quantitative generalisations as highlighted by Creswell (2009:195).

In line with Leedy and Ormrod (2005:135), an interactive research design will be followed since the researcher as observer will spend time on mining sites to interact regularly with participants. Face-to-face data collection techniques will be used to gather data from people in their immediate work environment. Interviews will be the major activity during the interaction periods. In an interactive design in which people are involved, ethical clearance will be obtained with the purpose of protecting the participants in order to assist the researcher to responsibly manage ethical conduct.

A qualitative research methodology will be followed and qualitative data collection and analysis methods will be implemented to address the research questions and to achieve the purpose of the research. The process of qualitative research is largely inductive, with the inquirer generating meaning from the data collected in the field as quoted by Creswell (2009:9) from Crotty (1998) assumptions regarding Social Constructivist Worldview. Mouton (2008:195) confirms the following explanation by Rubin and Rubin (1995:42-43) by stating the researcher will be aware of the trend where you cannot plan the entire design for a qualitative project in advance as a concrete design, because the design changes as you learn from the interviewing and communicating with the participants. However, you can begin the work with a rough and tentative design as you think it will progress in the study, talk with potential interviewees, sort out initial ideas, refocus the research and decide whom else to talk to and about what and then perform the applicable adaption when and where applicable during this research study.

1.7. PARADIGMATIC PERSPECTIVE

1.7.1 Paradigm

Creswell (2009:6) refers to paradigm as “...*Worldview*” with the meaning of “*a basic set of beliefs that guide action*” quoted from Guba (1990:17). “*The paradigm or worldview is a general orientation about the paradigm or world and nature of research that a student holds. These views are shaped by the discipline of the researcher, the beliefs of advisors and faculty in a student’s area, and past research experience.*” Neuman (2011:94) describes paradigm as “*a general organizing framework for the theory and research that includes basic assumptions, key issues, models of quality research and methods for seeking answers.*” The paradigm of this study, including the strategy and methods, contributes to the research design, which will be a Qualitative Constructivist approach by applying the following methods for seeking answers. The researcher seeks to establish the significance of difference in training and development opportunities for engineering learners’ such as the Electrician, Fitter, Diesel Mechanic, MC & I, and Plater Boilermaker and how it develops. The researcher also seeks to establish the shared patterns of these opportunities. The strategy will elaborate the case study of the Rigger Ropesman learner in comparison with other similar engineering learners, such as the Electrician, Fitter, Diesel Mechanic, MC & I, and Plater Boilermaker. The paradigm of this study will form part of research practice as indicated in the role of the researcher in the next paragraph.

1.7.1.1 The researcher's role

The researcher's collaborative partnership with participants is essential to ensure that data is collected and analysed data with the main aim of creating understanding of what needs to be done and how it needs to be done during the particular processes. The researcher's personal experience of 24 years as qualified Rigger Ropesman, Rigger Foreman, Rigger HRD Officer, and his current work as HRD Coordinator, will be utilised to guarantee the correct perspective and spectrum of data collection. As observer, the researcher will observe the participants' actions and reactions during the interviews and will remain unbiased by being attentive on the following bias indicators: The researcher will be aware when becoming overly subjective, the researcher will be alert when not being critical enough on own interpretations and the researcher will provide enough raw data to link to his unbiased interpretations as confirmed by Marshall and Rossman (2006:206).

The following functions will form part of the researcher's role:

- Preparing individual interviews;
- Preparing interview records and schedules;
- Conducting interviews;
- Observing participants during the interviews,
- Transcribe interviews and
- Analysing documents, policies, directives, procedures, work skills plans and annual reports.

The broader perspective of the study is elucidated in the next session as the theoretical assumptions.

1.7.2 Theoretical assumptions

De Vos *et al.* (2010:37) summarises theories as empirical and practical statements that can be tested while one has to bear in mind that these statements consist out of at least two concepts that relate to one another. The theoretical assumptions mentioned below display this characteristic of a phenomenon that will be investigated and then be re-formulated to outline a scientific theory.

In terms of qualitative research design, the theoretical assumptions of this study can be cited as follows:

- There should not be variance between the training and development of the Rigger Ropesman and that of other similar engineering trades.
- If such a variance exists, what are the contributing factors?
- The Rigger Ropesman's training and development opportunities must enjoy equal status to other artisans in the Mining and Minerals Sector.
- The Rigger Ropesman's quality of training and development must be consistent with other artisans in the Mining and Minerals Sector.
- Career development opportunities for the Rigger Ropesman must be comparable to that of all artisan trades in the Mining and Minerals Sector.

Anfara and Mertz (2006: xxvii) explain their definition of theoretical frameworks as that which allows the researcher to visualise and comprehend the elements of the study within a broader perspective. The above theoretical framework or assumptions explore the aim of this research study. The next section will elucidate the terminology and concepts used in the study.

1.7.3 Explanation of concepts

The motivation for the explanation of the concepts and terminology referred to in this study will be to clarify the field and environment where the study will be done.

1.7.3.1 Adult Learning

In the workplace various activities and interventions are developed to ensure that adult learning takes place. Coetzee and Botha (2007:54) confirm that children's learning processes are ignited by their curiosity and learning environment. Adults are more orientated to learn for future application and display several characteristics that influence their adult learning processes. These characteristics include motivation or need to know, readiness to learn, performance orientation, mastery orientation, and experience level, as confirmed by Coetzee and Botha (2007:54, 55). In this study adult learning becomes strategic in the concept of the learner's training and development throughout developed learning interventions and learning opportunities to be explored as a qualified artisan. The spectrum of an adult learner as lifelong learner will be reflected upon in Chapter 2.

1.7.3.2 Apprenticeship

An apprenticeship is a structured learning programme that leads to a nationally recognised qualification on the National Qualifications Framework as stated by Coetzee *et al.* (2007:175). The Amendment of the Skills Development Amendment Act 37 of 2008 Section 1(a) defines apprenticeship as: “**apprenticeship** means a “**learnership**” in respect of a listed trade, and includes a trade test in respect of that trade”.

1.7.3.3 Artisan

An artisan is “a person who has been certified as competent to perform a listed trade” in accordance with the Skills Development Act 97 of 1998 Section 26B.

The route to achieve artisan status includes features such as:

- “A structured learning programme of knowledge, practical and work experience
- A structured learning programme that must be successfully completed before a final assessment is attempted
- A final external summative assessment that must be passed and is known as a trade test.” Quoted from Government Gazette, 31 August 2012 16 No. 35625.

1.7.3.4 Artisan Development

Different forms of artisan development schemes will be concentrated on in the study such as short courses, Foreman schemes and Engineering overseer schemes, which all form part of the career path of the artisan. Mining company norms and standards regarding artisan development differ because each company promotes their own career development plans in accordance with their specific company needs and workplace skills plan for their own future endeavours. This study will focus on the artisan development scheme as offered by Anglo Platinum for the Electrician, Fitter, Diesel Mechanic, MC&I, Plater Boilermaker and Rigger Ropesman. The Rigger Ropesman will also be referred to as from outside the abovementioned company in order to obtain more information regarding training and development opportunities as a perspective within the Mining and Minerals Industry.

1.7.3.5 Education Training and Development (ETD)

Meyer et al (2012:553) defines Education, training and development (ETD) as *“the term used to describe the practices which directly or indirectly promote the support of learning”*. The support of learning is a major role-player in the economic spectrum of the country as described by the following author. Truman in Coetzee et al. (2007:3) describes Education, training and development (ETD) as an important factor in meeting the country’s economic and the employer’s **strategic, business and operational** goals. These three concepts integrate into a system which greatly impacts on the human resource development in organisations according to Meyer (2007:5). Whether we call it a factor or a system, it is part of the human resource development spectrum and it influences the performance of the workforce. Meyer et al. (2007:5) refer to education as *“the activities directed at providing the knowledge, skills, moral values and understanding required in the normal course of life.”* It can thus be argued that education is a process that starts with childhood and continues throughout the adult working career as part of life development. The Skills Development Amendment Act 37 of 2008 stipulates that the term **“training”** in the Act is replaced by **“skills development”**, which amplifies the core essence of a candidate’s personal skills improvement. The term **“training provider”** is also replaced with the term **“skills development provider”**, emphasising the quality of skills development as one of the key focus areas of the Act.

1.7.3.6 Human Resource Development (HRD)

Meyer et al. (2012:553) defines HRD as *“all processes, systems, methods, procedure and programmes an organisation uses to develop its human resources in order to equip its employees to contribute to organisational performance.”* This definition confirms that HRD includes both training and non-training scenarios, in other words affirming that people development occurs as part of our daily lives within the work environment. The rationale for this definition includes that people play a decisive role in an organisation to produce product and provide services in a global competitive environment as highlighted by Meyer et al. (2007:1). In South Africa, HRD is continuously infused with the new paradigm in training called Outcomes Based Education (OBE), which contains standards of what the learner must be able to perform at the end of the learning intervention. As a result the HRD Officer/Practitioner must frequently align and revise HRD programmes in sustaining the OBE system.

1.7.3.7 Learnership

The Skills Development Amendment Act, 2008 states that:

A SETA may establish a learnership if:

- *The learnership consists of a structured learning component;*
- *The learnership includes practical work experience of a specified nature and duration;*
- *The learnership would lead to a qualification registered with SAQA and related to an occupation; and*

The intended learnership is registered with the Director-General in the prescribed manner.

1.7.3.8 Mine

In terms of the Mine Health and Safety Act 57 of 1996 Regulation 29, a mine is defined as:

(a) when used as a noun -

Any borehole, excavation, in any tailings or in the earth, including the portion of the earth that is under the sea or other water, made for the purpose of searching for or winning a mineral, whether it is being worked or not; or any other place where a mineral deposit is being exploited, including the mining area and all buildings, structures, machinery, mine dumps, access roads or objects situated on or in that area that are used or intended to be used in connection with searching, winning, exploiting or processing of a mineral, or for health and safety purposes.

But, if two or more excavations, boreholes or places are being worked in conjunction with one another, they are deemed to comprise one mine, unless the Chief Inspector notifies their owner in writing that those excavations, boreholes or places comprise two or more mines, or a works; and

(b) when used as a verb –

The making of any excavation or borehole referred to in paragraph (a), or the exploitation of any mineral deposit in any other manner, for the purpose of winning a mineral, including prospecting in connection with the winning of a mineral.

1.7.3.9 Organising Framework for Occupation

The Organising Framework for Occupation (OFO) is a skills based coded occupational classification system. It is the Department of Higher Education and Training's key tool for identifying, reporting and monitoring skills demand and supply in the South African labour market according to the MQA Scarce Skills Guide (2008:19). The occupation of a Rigger Ropesman is reflected on the (OFO) under the DOL Registration Number 16Q160009001273 R as clarified by the Quality Council for Trades and Occupations (QCTO) Curriculum and Assessment Policy Version 1 (2011:4).

1.7.3.10 Rigger Ropesman

The Rigger Ropesman is an artisan who performs Mechanical Handling (Rigging) activities. This includes the lifting, handling, moving and positioning of: commercial goods, mining goods, machines, equipment, components, or fabricated structures using manual and mechanised lifting equipment and machinery (including mobile machines) SAQA (2008:2).

The work areas of the Rigger Ropesman in the Mining and Minerals Sector might vary depending on the area of responsibility appointed in, namely, Open Cast Mining; Underground Conventional or Trackless Mining; Inclined or Vertical shafts; Winder Rope sections; Shaft Sinking and Development sections; and the Surface or Plant sections of a mine.

1.7.3.11 Return on Investment

The return on investment regarding the training and development of the Rigger Ropesman in the Mining and Minerals Sector (MMS) entails evaluation to ensure legitimacy and effectivity of the learning interventions devoted on the candidate. Meyer (2004:255) focuses on the rationale for evaluating training in organisations and analyses the key roles to measure and evaluate, in order to ensure that ETD department is a true business partner with the organisation. The outcome of the learning intervention of the Rigger Ropesman will be part of the value added to the organisation and the MMS reflecting on the skills and abilities of the artisan.

1.7.3.12 Scarce Skills

Scarce Skills refer to those occupations in which there is a scarcity or shortage of qualified and experienced people. This scarcity can be current or anticipated in the future, and is usually due to the fact that either people with these skills are simply not available, or the fact that they are available, but do not meet the organisation's employment criteria. This scarcity can arise from one or a combination of the following, grouped as relative or absolute as stated in the MQA WSP, 2009 April to 2010 March.

- **Absolute scarcity**

Suitably skilled people are not available at all, for example:

- new or emerging occupations
- hard-to-fill vacancies
- people have chosen not to pursue training or careers in the occupation, for a variety of reasons and when
- there is a specific occupational health and safety demand for people with particular qualifications to meet regulatory requirements as stipulated in the MQA WSP, 2009 April to 2010 March.

In the research interviews this issue is addressed as one of the interview questions.

- **Critical Scarce Skill**

Critical scarce skill refers to particular capabilities needed within an occupation, for example in the Rigger Ropesman trade the following skills are prominent skills;

- general management skills,
- communication skills, lifting and moving unequal loads,
- tandem lifting, maintenance of mine winder ropes and
- replacement of mine winder ropes as per MQA WSP, 2009 April to 2010 March.

- **Relative Scarcity**

Relative scarcity means that suitably skilled people are available but do not meet other employment criteria, for example:

- Geographical locations, i.e. people are unwilling to work outside urban areas;
- Industry attractiveness, i.e. suitably skilled people are unwilling to work in particular industries, because they perceive that industry to be in decline or unsafe or otherwise unattractive;
- Equity considerations, i.e. there are few if any candidates with the requisite skills (qualifications and experience) from the designated groups (black people, women, people with disabilities) available to meet the skills requirement of the organisation, and
- Long training lead-time, i.e. there are people in education and training (formal and work-place) who are in the process of acquiring the necessary skills (qualification and experience) but where the lead time will mean that they are not available in short term to meet replacement demand as stated in the MQA WSP, 2009 April to 2010 March.

1.7.3.13 Quality Council for Trades and Occupations (QCTO)

The QCTO was established in terms of the Skills Development Act 97 of 1998, Section 26G. The functions of the QCTO are stipulated in the Skills Development Act 97 of 1998; Section 26H as the following:

- (1) *“The QCTO must advise the Minister on all matter of policy concerning occupational standards and qualifications;*
- (2) *The QCTO must perform its functions in terms of the Skills Development Act 97 of 1998 and the National Qualifications Framework Act 2008.*
- (3) *Subject to any policy issued by the Minister in terms of Section 26F of the abovementioned SDA, the QCTO is responsible for:*
 - (a) *Establishing and maintaining occupational standards and qualifications;*
 - (b) *The quality assurance of occupational standards and qualifications and learning in and for the workplace;*
 - (c) *Designing and developing occupational standards and qualifications and submitting them to South African Qualifications Authority for registration on the National Qualifications Framework*
 - (d) *Ensuring the quality of occupational standards and qualifications and learning in the workplace;*
 - (e) *Promoting the objectives of the National Qualifications Framework;*
 - (f) *Liaising with the National Skills Authority on the suitability and adequacy of occupational standards and qualifications and on the quality of learning in and for the workplace;*

(g) Liaising with the South African Qualifications Authority, other Quality Councils and professional bodies responsible for establishing standards and qualifications for the quality assurance of standards and qualifications; and

(h) Perform any other prescribed function.”

The QCTO will thus be involved with all occupational standards and qualifications, which will include the Rigger Ropesman qualification as dealt with in this study. The researcher in this study are involved and nominated by the MQA as subject matter expert to represent the MQA when the Rigger Ropesman qualification occupational standards and qualification will be designed and developed by the QCTO. The training and development opportunities clarified in this study will indicate the career opportunities for this specific occupation. These opportunities will then be highlighted during the design and development phases for the QCTO when the Rigger Ropesman qualification and occupation is dealt with. The following section will discuss the Ethical Considerations applicable to this study.

1.8 ETHICAL CONSIDERATIONS

Meyer and Botha (2004:310) mention that the discipline of ethics in general context refers to what is right and what is wrong when dealing with other people and how we make decisions. In this perspective a detailed prescribed application form was submitted for approval by the Ethics Committee of the NWU Office for Research Support. The following Ethical Clearance number was issued to the researcher: NWU-0097-11-S2

This study will be done within the ambit of the principles set out in the Ethical Code of Practice of the North West University. Ethical moral commitment pertains to:

- Professional competence,
- Professional relations,
- Privacy,
- Confidentiality, records, research and publication.

The researcher aims to treat participants with dignity and reduce anxiety or discomfort. The researcher will obtain the necessary written informed consent from each participant. This document provides the potential participant with the following:

- more information on the research project
- explain what will be expected of the participant

- which precautions were taken to protect the participant
- how will the findings of the project be made available
- the signed agreement by the participant to voluntarily participate in this research project and
- Acknowledgment that it was done without strain and demands sited on the participant to partake in this project.

An example of the Informed Consent form can be seen in Addendum C.

It is also the responsibility of the researcher to ensure the confidentiality of data (Neuman, 2000:283). The researcher will furthermore be open and frank about the purpose of the study and will not be dishonest during the research study; it is one of the core values of the researcher to be honest in all aspects in his life.

The researcher, who is also the Project Head, applied and declared the following prescribed ethical considerations by the Ethics Committee of the NWU Office for Research Support. These considerations relate to the particular research project:

The information in this application is, to the best of the researcher's knowledge correct and no ethical codes will be violated during the study.

- i. The researcher will assure that the project is managed ethically justifiably from beginning to end.
- ii. The researcher will explain to all participants the principle that their participation in the research project is voluntary and that no pressure will be placed on any participant to take part.
- iii. The Researcher will clearly state to all participants that any participant may withdraw from the project at any time and may ask that his or her data no longer be used in the study, without stating any reasons for withdrawal, and without fear of any form of discrimination.
- iv. The researcher will issue an informed consent form to every participant and will ensure that every participant fully understands the information process.
- v. The informed consent forms will be signed in writing before the interview commences by all of the participants.
- vi. The researcher will ensure that any foreseeable risk is restricted to the minimum, any permanent damage is avoided and that all appropriate precautions and safety measures are in place at the different venues where the interviews will be held with the participants.

- vii. The researcher will ensure that all the information of all participants will be respected and ensured.
- viii. The researcher commits to report any problems and complications to the Ethics Committee.
- ix. The researcher undertakes to respect intellectual property and to avoid any form of plagiarism or breach of copyright.

The above Ethical Code of Practice of the North West University corresponds with the Ethical Code of Practice in the South African Board for People Practices (SABPP) Ethics in HR Management Guide 2011.

This study is obligated when using sources as in the prescribed guidance of the Quoting Sources; Engela J van der Walt (2006) from the Ferdinand Postma Library North West University Potchefstroom.

The review of the chapters in this research study will be summarised in the next section.

1.9 PREVIEW OF CHAPTERS

Based on the preceding research problem, questions and paradigm, the chapter preview is set out as follows:

Chapter 1 presents the introduction, the researcher's orientation and motivation, together with the problem statement and aim of this study's investigation into the Rigger Ropesman development opportunities in the Mining and Minerals Sector. The briefing on the study method sets the paradigm of the study and clarifies the researcher's role and function. Theoretical assumptions and explanations of mining environment concepts set the background and ethical commitments for this study are borne in mind.

Chapter 2 provides the background and basis of this study and contextualises the Rigger Ropesman's engineering occupation and trade. This chapter also sets out the history of apprenticeships, learnerships, and development opportunities. The qualification spectrum and current role of the artisan is discussed and the adult learning environment is dealt with as an engagement into the world of an artisan. Learner profile before, during and after the qualification is clarified to indicate the career foundation of the artisan as an engineering tradesman.

The Rigger Ropesman qualification within the Mining and Minerals Sector and MQA indicates the status of this qualification within the Seta. The ratio of the Rigger Ropesman learners in comparison with other similar trades within the MQA confirms the rationale and relevance of this study. Current literature, such as the WSP's and ATR's are referred to as indicators of the number differences and ratios of trades within the context of this study.

Chapter 3 presents the perspective in qualitative research study, as mentioned by Creswell (2009:62). This chapter focuses on the types of questions asked in the study and highlights the advantages of qualitative design. The case study is clarified and face to face interviews are explained. Site selection, document sourcing and the sampling method are clarified and supported by the researcher's role. The study limitations are also expressed before the chapter is concluded.

Chapter 4 presents data analyses and interpretation to acquire data patterns and trends, as described by Mouton (2008:109). The meanings of the themes and descriptions formulated in relation to the research questions are clarified. The validity, reliability and data triangulation forms an integral part of the chapter study to ensure an appropriate conclusion as product of the intervention.

Chapter 5 summarises and concludes the contribution of the study as part of diverse educational, training and development interventions in the MQA and Mining and Minerals Sector. Limitations and findings are presented for the set hypotheses. Recommendations for possible future research are made for the Rigger Ropesman, the SETA, the Employer, and future studies in this field. The chapter is ended with a conclusion.

1.10 CONCLUSION

The core of this chapter was to set the orientation, motivation and problem statement of the study in order to indicate the rationale for the study as confirmed by Mouton (2008:114).

The problem statement was formulated as the following three research questions:

- What are the training and development opportunities for a Rigger Ropesman learner and artisan in the Mining and Minerals Sector?
- To what extent does the training and development of Rigger Ropesman learners vary from the training and development of other similar engineering trades' learners?
- If such a variance exists, what are the contributing factors?

The qualitative research design method was reflected on as method to be used for exploring and understanding the above research problem. Mouton (2008:99) confirms that fieldwork will be performed by the researcher in applying the following categories: individual and group interviews; as the collection of data sources as it will be conducted in this study.

The paradigm of the study will be to establish the meaning of variant opportunities of engineering learners, how it develops and what the shared patterns of these opportunities are. The chapter preview briefly explained how the dissertation will unfold.

Chapter 2 will present the background of the Rigger Ropesman as an engineering occupation and trade in the Mining and Minerals Sector. The history of apprenticeships, learnerships, and qualification spectrum including development opportunities will profile the model of the chapter. The adult learning environment of the learner will be dealt with as engagement into the world of an artisan. The profile of the learner before, during and after qualifying will be discussed to indicate the career foundation of the artisan. Training and development processes and quality are included into the comparison of engineering training and development.

CHAPTER 2

CONTEXTUALISING THE RIGGER ROPESMAN AS AN ENGINEERING OCCUPATION AND TRADE

2.1. INTRODUCTION

The previous chapter set the orientation, motivation and problem statement of the study in order to clarify the background of the study. The aim of this chapter is to contextualise the rationale of the problem statement regarding Rigger Ropesman development amongst engineering artisans in the Mining and Minerals Sector. This chapter provides an overview of the Rigger Ropesman's position as an engineering occupation and trade.

The focus will be on the following factors:

- The history of apprenticeships and learnerships
- The adult learning and education context of the Rigger Ropesman
- The Rigger Ropesman qualification within the Mining and Minerals Sector and the MQA
- The Rigger Ropesman learner numbers in comparison with other trades within the Mining and Minerals Sector
- Literature pertaining to the development of engineering training and of learners and artisans in the Mining and Minerals Sector
- The profile of the Rigger Ropesman during the learnership
- The return on investment for the Mining and Minerals Sector to provide training and development for Rigger Ropesman learners and artisans.

2.2. THE HISTORY OF APPRENTICESHIPS AND LEARNERSHIPS

This section aims to set the background of the history of artisans in South Africa to create a clear perspective of the development of artisans in the country. The history of apprenticeships in South Africa were brought into the country by Dutch, French, German and British immigrants during the 1700's and 1800's as explained by Gamble (2004:22). The following background will embark on the time line of the artisan history of South Africa.

2.2.1 Background of the artisan history in South Africa

The background of artisan history in South Africa emanated from pre and post Industrial Revolution timeframe. The trend during those days required the apprentice to work under close supervision of an artisan or so-called “journeyman“. The apprentice worked under the supervision of the master artisan in all areas of the specified trade. Gamble (2004:13) confirms the apprentice contract stipulated the confidentiality clause in which the apprentice undertook to keep the secret of trade and work practice of the master artisan. The apprentice also agreed to obey and serve the master artisan truthfully. The master artisan agreed to tutor the apprentice, provide him with accommodation, food and a pre-determined wage as explained by Gamble (2004:13). This trend and development thereof is discussed in this chapter to clarify the training and development opportunities of apprentices during these historical times.

In 2008 the Manufacturing, Engineering and Related Services SETA (Merseta) commissioned an Impact Assessment of Learnership and Apprenticeship Study to ascertain the efficiency and effectiveness of Learnership and Apprenticeship systems and to assess their impact on the demand for and supply of skills in the industry, Merseta (2008:7). Within this study, a timeline presents the various acts, papers, reports and strategies in the history of apprenticeship, learnership and skills development in South Africa. The reflection on this timeline and on the additional literature develops a summary and overview of the artisan development and history in South Africa. The summary of the Merseta 2008 study together with a similar literature review is used to reflect the skills development timeline of apprentices, learnerships and artisans.

2.2.2 Skills Development Timeline of Apprenticeships, Learnerships and Artisans

The following timeline indicates timeframes and major activities in apprenticeship, learnership and artisan history in South Africa. The *Human Resource Development (HRD)* role will be explained indicating the various trends and systems applied during the applicable time period. The *Education Training and Development (ETD)* experienced numerous changes to attempt to meet the *country’s economic and employer’s strategic and business operational goals*.

1884 First apprenticeship classes

Natal Government Railways Durban under the Master of Servant Act held the first apprenticeship classes which consisted of practical workplace training (Merseta 2008:7). The

scenario described in the previous section as the background of artisan history in South Africa occurred during this period in 1884.

1921 Juvenile Act

The Juvenile Act of 1921 removed the Master and Servant contracts and relationships of apprenticeships awoken (Merseta 2008:7). The opportunity allowed young whites who became apprentices to acquire skills and hold it their own in competition with other low-paid adult workers who learned their skills out of years of on the job experience. The apprenticeship system increased the pace of learning of the young persons in the work environment. The other population groups were not employed as apprentices.

1922 The Apprenticeship Act of 1922

The Apprenticeship Act of 1922 regulated apprenticeship to certain trades. It also regulated the contracts of apprentices. The Act provided for the establishment of powers and functions of Regulating Committees (Merseta 2008:7). Gamble (2004:23) notes that only white apprentices were included in this Act, until the Manpower Training Act 1981 (Act.56 of 1981) was promulgated as stated by De Villiers (1984:1).

1939-1944 Second World War

Training of apprentices during the Second World War was not part of production flow practices. Gamble (2004:25) reviews these production flow practices when mass production of war supplies were required by armed forces in the war. Accordingly, civilian workforce training resulted in the establishment of Practical Training Centres such as the Central Organisation of Technical Training (COTT), to address the shortage of skilled artisans (Merseta 2008:7).

1944 De Villiers Commission of Inquiry

The De Villiers Commission of Inquiry was established, This commission attempted to address the shortage of white apprentices by seeking to understand reasons for the general lack of interest exhibited by white youths against entering into apprenticeship contracts (DoL 2008:14).

1945 The Apprentice Act No 37 of 1944

The Apprenticeship Act No 37 of 1944 and the National Apprenticeship Board was promulgated and included provisions for whites only. (Merseta 2008:7). The government demonstrated a direct disregard of other ethnic groups. The Apprenticeship Act No 37 of 1944 was applied and training and development in engineering apprentices only benefitted white youngsters. The results of this decision filtered through to the workforce and the shortage of apprentices became evident in 1951.

1948 Formal Technical College and Trade Test

The De Villiers Commission of Inquiry's main recommendations concerned the introduction of trade tests that would allow above average apprentices to reduce their training time. The training time consisted of one year's institutional training followed by three years' practical training with an approved employer. The apprenticeship curriculum included practical workplace and institutional training, formal theoretical training in a technical college, and a formal trade test (DoL 2008:14).

1951 Training of Artisans Act 1951

The De Villiers Commission of Inquiry Report led to the Training of Artisans Act 1951. This act empowered the Minister of Labour to address the shortage of artisans in the construction sector. The Act included provision for one year's institutional training followed by three years' practical training (Merseta 2008:7).

1960 Journeymen Status

The National Apprenticeship Board alleviated the legislation promulgated in 1951 by recommending that apprentices who failed the trade test should still receive full journeymen status as referred to by Gamble (2004:25) in Lewis (1984:131).

1963 The Apprentice Amendment Act of 1963

The 1958 review of the passing of the Apprenticeship Amendment Act of 1963 which provided block release classes, voluntary trade school attendance, second last year voluntary trade test and extension periods for lost time and log books. This act was retained until repealed in 1981 (Merseta 2008:7).

1965 Importation of Artisans from the United Kingdom

Gamble (2004:25) refers to a training scheme initiated in 1965, which opened the door for trainees to bypass the apprenticeship system and requirements in being converted into artisans by "*efflux of time*". The DoL Research Consortium state in the "Scarce and Critical Skills Research Project" (2008:15) state that the skills shortage had to be addressed. During 1960 – 1970 the De Villiers Commission's recommendations included the importation of skills from the United Kingdom and elsewhere. The influx from the United Kingdom and elsewhere were known as the "10 pound pom". These artisans received 10 pounds for passage to South Africa from the Government.

This action was repeated when the skilled labour shortage re-emerged as a problem during the 1990's.

1977 Black unions challenge the apprenticeship system

The growth of the economy during the early 1960's caused uproar in black worker organisations in the 1970's. Black unions started to challenge the system by means of strikes that led to the known 1973 Durban strikes. The outcome was the introduction of new laws to allow market dominance to predominate the scenario as the Apartheid regime became under strain. The commissions in place argued the importance of the market player in the industry and the limited

role that the state had to fulfil. During July 1977, the Wiehahn Commission inquired into Labour Legislation, including the Apprenticeship Act. Next was the Riekert Commission of Inquiry, looking into legislation affecting the utilisation of Manpower (Merseta 2008:7).

1981 Manpower Training Act of 1981

The result of the Wiehahn Commission who headed the Labour Law, and the Riekert Commission who investigated black urbanisation and community development led to the streamlining and rationalising of labour and training legislation which was implemented on 1 November 1981 as The Manpower Training Act (MTA). This Act consolidated employers, employees and the State with responsibility towards the private sector. The State's function was to define the legal framework, coordination and applicable standards. In addition, the commissions recommended the establishment of the National Manpower commission (NMC) and the National Training Board (NTB). The NTB however excluded the representation from the unions allied to Congress of SA Trade Unions (Cosatu) as augmented by Merseta (2008:7) and DoL (2008:16). One of the initial major tasks of the NTB included a linked researched project with the Human Science Research Council (HSRC) on artisan training in South Africa.

1985 Investigation into Artisan Training released Report

The Investigation into Training of Artisans report released by the NTB and HSRC spelled out the following criticism:

- The inappropriate approaches to apprenticeship produced low standard artisans implicating that practical training was largely unsupervised and unstructured.
- The “effluxion of time” system meant that mainly white workers achieved artisan status after five years (even if they did not pass a trade test).
- The fact that apprenticeship training was rigid and “time-based” with disregard to the apprentices’ differing learning tempos and abilities caused general problems for the industries.
- The apprentices did not enjoy the full spectrum of training in their trades because employers could not provide adequate facilities and equipment to be trained on. Overall skills training caused more reason for concern as stated by NTB/HSRC (1985).

1990 Competency Based Modular Training

The Manpower Training Act transferred the responsibility for apprenticeship training from the State to the floor where the different industry training boards became responsible for all the training matters in the industry sector as affirmed by Gamble (2004:26,27). The quality of training delivery now rested on the shoulders of the industry accreditation as the training strategy and scope became part of the industry norm and standards.

The Act redirected training for apprentices to convert to Competency Based Modular Training (CBMT). The learning material contained a module that consisted out of objectives to be achieved; theoretical knowledge and information; practical exercises for the module and a self-assessment for the apprentice to test his/her own progress and competence. The apprentice then underwent a criterion test with his/her Training Officer to be signed off on the module when completed successfully. The curriculum consisted of on-the job and off-the job phases that constituted the modules to be achieved. These phases had to be completed before an application for trade test readiness could take place.

The technical education required for the trade test was a National Technical Certificate Level 2 (N2) which was obtained at the Technical Colleges. The major subjects for this Certificate were Mathematics, Engineering Drawings, Engineering Science and Trade Theory. This N2 qualification could be completed as full time or part time/evening classes at colleges and included the option of distance learning. The researcher was involved at Westcoll for 10 years as Rigger Ropesman lecturer and provided assistance for students as far as Namibia and Botswana.

1991 National Training Strategy

The National Training Board (NTB) agreed in 1990 to begin a process of negotiating a new National Training Strategy. In this process all stakeholders, such as representation from employers, unions, the ANC, Department of Education, government, and training providers became involved (DoL 2008:19).

1994 National Training Strategy Initiative

The National Training Strategy Initiative (NTSI) was published in April 1994. The NTSI approach included the integration of education and training into a single department which

eventually only took place during 2008. One of the after-effects of the NTSI was the expanding and replacing of the Industry Training Boards with Sector Education and Training Authorities (SETAs) (DoL 2008:19).

1995 The South African Qualifications Act of 1995

The South African Qualifications Authority (SAQA) Act of 1995 was promulgated as the first piece of legislation passed by the newly elected government of 1994. SAQA keeps an eye on the National Qualifications Framework (NQF) which will provide a framework for all qualifications and recognition of prior learning. Skills got recognised beyond the single employer parameters according to Bird (2001:1). This act is replaced by the current National Qualifications Framework Act, 1995 (NQF Act, 1995).

1997 Introduction of Learnerships

The Green Paper on Skills Development (1997), drafted by DoL to ensure the implementation of the NTSI, proposed the introduction of a grant levy system. *“The introduction of learnerships and the repeal of the racially restrictive apprenticeship system”* received attention from all relevant stakeholders (Merseta 2008:8). The Green Paper indicated that apprenticeships would remain important and would be reviewed by standards setting and qualification restructuring. (DoL 2008:19).

1998 Skills Development Act 1998

The Skills Development Amendment Act (SDA) (Act 37 of 2008) incorporated apprenticeships. Certain sections of the MTA were repealed but nevertheless retained sections relating to apprentice training and development. Learnerships became the major focus point as a combination of unit standard-based structured learning. These learnerships also included practical work experience performed at the training provider and on the job work areas as confirmed by Gamble (2004:26, 27). Details of the learnership qualification will be clarified when the numbers' comparison between the artisan trades is dealt with in Chapter 4. Artisan's qualifications are registered with SAQA and rated on NQF levels. The following artisan qualifications form part of this study and are all registered as NQF level 3 qualifications, except

for the MC&I, which is registered as a NQF level 4 qualification: Rigger Ropesman, Fitter, Electrician, Plater Boilermaker and Diesel Mechanic.

2000 National Skills development Strategy 1

During March 2000, the Department of Labour launched the National Skills Development Strategy Phase 1. This included the starting point of the SETAs to deliver *“improved and available skills, rising employment levels and productivity”*. This was projected to be realised within a period of 2 to 3 years before the SETAs could actively deliver on their mandate as the core functions had to be established at first.

2003 Growth and Development Summit

The economy accelerated during these years and the stimulation by the SETAs and challenges regarding market related skills resulted in the decision to plan a Growth and Development Summit. The Growth and Development Summit of June 2003 adopted resolutions to strengthen the SETAs and encourage learnerships while setting a target for SETAs to enrol a number of 80 000 learners by 2005 (Merseta 2008: 7).

2005 National Skills Development Strategy 2

March 2005 marked the end of NSDS 1, with a result of 88410 unemployed learners and 45813 employed learners. From April 2005 to March 2010 NSDS 2 was implemented. Seta numbers were also reduced by combining SETAs with the same core training and development were joined into one SETA. The NSDS 2 addressed scarce and critical skills, and measured the impact of intervention by SETAs in this regard.

2010 Human Resources Development Strategy for South Africa (HRDS-SA) 2010-2030

The goals of the Human Resources Development Strategy for South Africa (HRDS-SA) 2010-2030 were approved by the Minister of Higher Education and Training during March 2009 and are explicitly intended to contribute to achieve the following national goals:

- To urgently and substantively reduce the scourge of poverty and unemployment in South Africa;
- To promote justice and social cohesion through improved equity in providing outcomes for education and skills development programmes; and
- To substantively improve national economic growth and development through improved competitiveness of the South African economy.

In pursuance of the above goals, this HRD strategy was designed to complement a range of purposeful development interventions to achieve the following:

- An improvement in South Africa's Human Development Index and the country's global Human Development Index ranking;
- An improvement in the measure and ranking of South Africa's economic competitiveness;
- A reduction in the Gini coefficient which includes the correspondence to a reduction in the inequality of wealth in the country, referring to the ratio of the income of the richest group to that of the poorest group. South Africa has a huge inequality among its population and highest in Africa in 2009 of 63:1; http://en.m.wikipedia.org/wiki/Gini_coefficient Date of access 14 October 2013. Since HRD is critical to improving a person's standard of life and the more educated a nation is the more equal the Gini coefficient will become. The Gini coefficient is an appropriate macro measurement to determine whether HRD efforts through the HRDSA is improving or worsening South Africa's equality ratios.
- An improvement in the measure of social cohesion as measured through specific social surveys.

2011 National Skills Development Strategy 3

The Minister of Higher Education and Training Dr Blade Nzimande made the following statement during a Press briefing held on 13 January 2011: *“Significant work was done during the periods of NSDS 1 and 2, and many important building blocks were put in place. However, the economy remains constrained by severe lack of skills, and so the skills development system as a whole has not yet achieved what was expected. The NSDS 3 strategy draws on lessons learned from NSDS1 and 2. The key driving force of this strategy is improving the effectiveness and efficiency of the skills development system”*. The NSDS 3 focus on eight goals, each consisting of outcomes and outputs which will be used as the platform for monitoring and evaluating the implementation and impact of the NSDS.

The shortage of artisan skills is the focus in Goal 1 and the intention is to ensure that 10,000 artisans per year qualify with the relevant trade skills and be employed South African Government Information, (2012:1, 2). All these occupations are also listed on the *Organising Framework for Occupation (OFO)* as a *key tool for identifying skills demand and supply in South Africa*.

The summary of the apprenticeship and learnership as highlighted consisted of the events that filled the artisan background in South Africa. On the international front in England the apprenticeship frameworks (*framework referring to the type of apprenticeship programme e.g. Carpenter*) also went through various conversion stages as described by Fuller and Unwin (2011:33). The government in England are also involved in the apprenticeship as stakeholder and support the system with funding and legislation. The Specification of Apprenticeship Standards in England (SASE) outlined the government legislation as published in 2009 according to Fuller and Unwin (2011:33). The legislation refers to the apprenticeship framework that must include a competence-based and knowledge-based component with the rest of the framework that consist out of functional skills-mathematics, English language, Information and communications technology, personal learning and thinking skills, and employee rights and responsibilities. These subjects are a good comparable with the NCV level 2, 3 and 4 that are presented at our FET colleges.

The above Skills Development Timeline of apprenticeships, learnerships and artisans does not include every activity in the full spectrum of activities during this time period. Other topics such as Scarce Skills, the four routes to become an artisan, the role of the QCTO and NAMB, will be attended to later in the chapter. The next section will address Adult learning and education in context of the Rigger Ropesman.

2.3 ADULT LEARNING AND EDUCATION IN CONTEXT OF THE RIGGER ROPESMAN

The training and development opportunities for the Rigger Ropesman apprentice, learner and artisan in the Mining and Minerals Sector form part of the adulthood and maturity phases in his or her life. The adulthood and *Adult Learning* phase for the Rigger Ropesman apprentice or learner starts at a high pace due to the dangers and risks involved in the trade with “Lifting and Moving of Loads” as core element of the trade and *Artisan Development* phases.

2.3.1 Adulthood and maturity levels of the Rigger Ropesman

The Rigger Ropesman apprenticeship or learnership is normally engaged into at the age of 18 years, thus the starting point of a career and first step into adult life. Wiltsher (2008: 210) explains the concept of the adult as the fulfilment of a set of criteria that can be described by means of age, size, legal status and related descriptions, while adulthood is a status associated to age, maturity, experience and responsibility.

The components of adulthood entail the adult to be prepared to answer to the demands being made on our value systems, ethical standards and spirituality. For this reason physical, emotional, intellectual, normative and social powers attribute significantly to adult development. Hattingh (1990:15) singles out the importance of the following personality components:

- **The effective component (effective experience)** refers to the way the Rigger Ropesman deals with co-workers and subordinates during sensitive times in their lives. This component forms part of the responsibility of the Rigger Ropesman as he/she operates within a team of fellow workers.
- **The cognitive component (intellectual experience)** plays a major role regarding the decisions that the Rigger Ropesman must take during critical moments (e.g. the slinging of heavy and unbalanced loads in and out of shafts).
- **The normative component** (value and ethical system) has to do with ethical values. As an artisan one of the main ethical values is the onus to be honest and clear when giving feedback to superiors during and after the job completion.
- **The information management component** (perception and communication). This component becomes critical during certain tasks where communication forms part of the process of fulfilling the task (e.g. two-way or hand-signal communication forms are used when the persons involved cannot see or hear one another due to environmental circumstances). More examples of such tasks are: replacing a vessel in a process plant or replacing steel wire hoist ropes on an underground shaft winder compartment.
- **The gender component** (male or female). It is a reality that both genders are included in the Rigger Ropesman trade in Mining and Minerals Sector (detailed statistics will be discussed in the Chapter 4.3).
- **The physical component** (body awareness). This forms part of the daily performance of the Rigger Ropesman. The trade requires the physical lifting, moving, carrying and supporting of objects, tools and equipment during the performance of tasks.

- **The social component** (interaction with other humans). Rigging always involves other persons. This component requires the Rigger Ropesman to communicate with his/her team of fellow workers, who might include other artisans, employees in the workplace such as Winding Engine Drivers, Crane Drivers, artisan assistants, and various other persons involved in the specific task being performed. During these times the ability to communicate well, together with the efficiency skill, determines the continuous flow of the process which will ensure smooth operation (instead of frequently halted operations).
- **The metaphysical component (faith or spiritual)** This component displays the character of the persons leading to symmetry and mutual trust in the Rigging teamwork during dangerous, high risk tasks that must be performed, for example replacing steelwork in a vertical shaft. This scenario requires the team on the job to depend and trust each other for the safe and correct methods applied when specific tasks are carried out. The incorrect methods applied and carried out frequently leads to incidents and accidents with the end result causing injury to persons. In the worst case scenario it be the cause of an fatal accident.
- **The experience of the self** This component (self-image, self-concept) is an imperative component that becomes visible when specialised tasks are being performed, such as the installation of a Resin Socket on the Front End of the hoist rope for winding purposes. The Rigger Ropesman's self-image is what allows him/her to make engineering operational based decisions. These decision-making abilities are due to the confidence he/she has in the job that he/she has completed. These abilities therefore enable him/her to take responsibility for the work done.

2.3.2 The lifelong learning process of the Rigger Ropesman

To become an efficient adult artisan in the Rigger Ropesman trade, all the above components must develop to become more mature, compatible and to materialise as an adult life. This adult life must be seen as a lifelong learning process as the different phases of learning are continuous in all aspects of the trade, due to technological and work environmental variations.

2.3.2.1 The concepts of “pedagogy and andragogy”

The lifelong learning process of the Rigger Ropesman includes the concepts of “pedagogy” as well as “andragogy”. The “pedagogy” as quoted by Parr (2008:223) from Knowles (1996) means

“*leading the child* - thus the art and science of teaching the child”. The “andragogy” is defined by Knowles (1996) as the “art and science of helping adults to learn”. The Rigger Ropesman experiences both the above learning concepts during childhood as well as in his/her adulthood lifelong learning phases.

The Rigger Ropesman learner enters these adulthood characteristics as an integral part of his artisan development. It is essential for ETD practitioners to understand how adults learn best. The characteristics of adult learners are identified by Knowles (1980) as follows:

- **Self-concept:** The more a person matures, the more his/her self-concept moves from a dependent personality towards a self-directed human being. The Rigger Ropesman performs several tasks independently from other artisans or assistance and it is done at his/her own self-directed pace as human being; e.g. the inspection and measurement of winder ropes.
- **Experience:** The more a person matures the more experienced he/she becomes and this accumulated experience turns into a learning resource. The Rigger Ropesman *Artisan* experience with winder ropes at specific winders which forms part of his/her responsibility accumulates knowledge on how to manage and maintain these winder ropes differently due to their specified design criteria and work output.
- **Readiness to learn:** The more a person matures the faster his/her orientation and development aims become visible and sensible (Knowles, 1996) . The Rigger Ropesman *Learnership or Apprenticeship* and artisan maturity develop with his responsibility and thoughts while he/she is tasked to sling unusual loads down a vertical shaft. The slinging of these heavy unusual loads streamline his orientation and development aims in as he clearly distinguish between the correct and incorrect choices and decisions made. The aims become visible and sensible in the choices he has to put in place with the outcomes thereof being either positive or negative. These decisions mature the Rigger Ropesman to be ready to learn from every task and decision he makes. These complicated skills categorises the Rigger Ropesman to be a *Critical Scarce Skill* as the *particular capabilities* in the trade are scarce.
- **Orientation to learning:** The more a person matures the faster his/her time perspective grows from postponing to immediate application. His/her orientation towards learning therefore shifts from subject-centeredness to problem centeredness. The Rigger Ropesman develop perspective and insight to identify the causes of extraordinary problems; e.g. the bad coiling of winder ropes which is the visible fault but could be caused by several other defects such as winder drum alignment, winder rope length to short or other non-visible defects. The Rigger Ropesman orientation to learn these skills

relates to the *Relative Scarcity*, where the *Long training lead-time* to learn these skills causes a replacement challenge to the *mine*.

- **Motivation to learn:** As a person matures, the motivation to learn can be both internal and external. Internal or intrinsic motivational factors are personal factors where the individual wants to attain certain knowledge and skills. External or extrinsic motivational factors include factors such as job retention, promotion, working conditions and job status as affirmed by Parr (2008:224). The intrinsic motivational factors for the Rigger Ropesman occurs in numerous tasks e.g. when the learner or apprentice practise to slice a steel wire rope sling repetitively, until he/she can achieve the criteria of correct length, correct tucking of strands and wires and completing the splice within specified time allocated for the task. The extrinsic motivational factors includes the scenario of a Rigger Ropesman artisan working in the production section or pump section and he works to be promoted to the shaft Ropesman position. The shaft Ropesman position is considered and respected to be the position and status of the senior *Rigger Ropesman* on the shaft or mine.

Motivational factors are also emphasised by Maslow (1968) and Rogers (1974) as needs from within a person, ranging from biological to psychological needs (Parr 2008:225). Maslow's hierarchy of these needs is presented in Figure 2.1 on the next page.

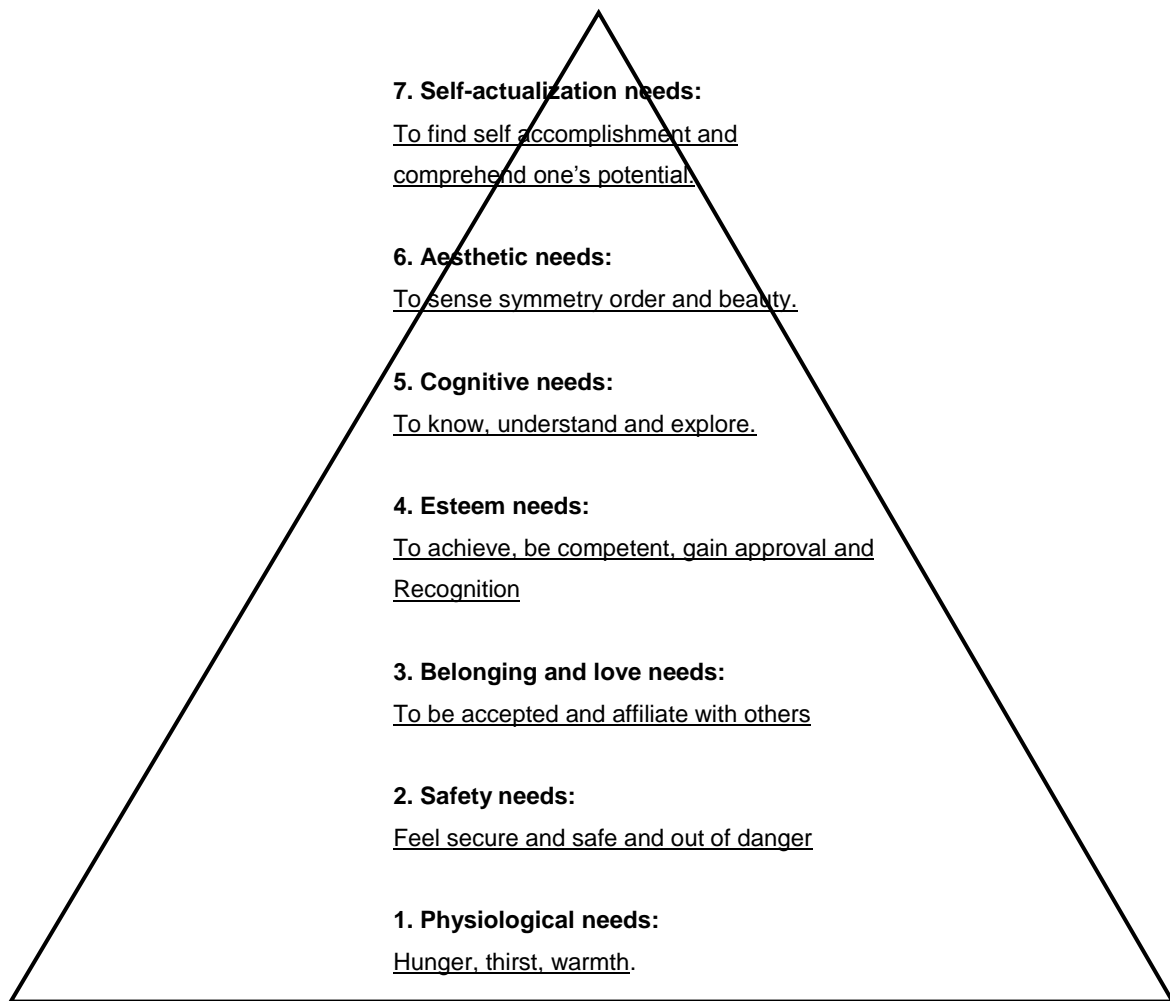


Figure 2.1 Maslow's Hierarchy of needs

(Smit & Cronje 1997:309)

- i. The development of the Rigger Ropesman in the Mining and Minerals Sector can indeed be linked to the above Intrinsic and Extrinsic motivational factors since adult learners use Maslow's hierarchy of needs. The Rigger Ropesman experiences the same physiological needs as any other person with regards to hunger, thirst and warmth as primary human needs.
- ii. The safety needs unfold to his/her work environment as one of the biggest elements of the specific artisan trade, since the person is continuously performing dangerous and high risk tasks. In these scenarios and circumstances additional and extraordinary precautions and measurements must be prepared and put in place before the task can be performed. One of the primary objectives of the Rigger Ropesman before performing a dangerous task is to feel secure, safe and out of danger; not just for him/herself but also for all the other persons, machinery and equipment involved in the Rigging action to be performed.

- iii. To belong to and be accepted by others is also part of the intrinsic motivational factors which motivates the Rigger Ropesman to develop him/herself in order to be affiliated as an engineering artisan amongst other artisans. When this status is achieved the time arrived for the Rigger Ropesman to start to add value to the mine and deliver his/her output of work, to ensure the mine receives the *Return on Investment* made during the training and development phases as learner or apprentice.
- iv. The esteem needs motivates the Rigger Ropesman intrinsically seeing that he/she will be motivated to achieve this competency during his/her learnership and trade test. He/she then becomes an artisan where he/she needs to be extrinsically motivated as an artisan to gain approval and recognition from his/her peers and superiors in order to be appointed for certain tasks and responsibilities within his/her work environment. These appointments affect his/her job status as Rigger Ropesman, for example the appointment of Ropesman on a shaft is regarded a more responsible position than a sectional artisan in a plant or underground section. This position leads to promotion, which is normally the route to become a Rigger Ropesman Charge Hand or Relieving Foreman and then Engineering Foreman.
- v. The cognitive needs are intrinsic and extrinsic motivational needs that motivate the Rigger Ropesman to broaden his/her knowledge as a tradesman, in his/her specific field of expertise, which will enable him/her to understand and explore other tasks and responsibilities further in the wider context of the Rigger Ropesman artisan, for example the Conventional Vertical and Incline Shaft mines, Open Cast mines and Trackless mines. Many of these mines experience *hard to fill vacancies*, resulting in *Absolute Scarcity* of Rigger Ropesman on these sites.
- vi. Aesthetic needs are intrinsic motivational factors that motivate the Rigger Ropesman to think creatively during the processes while performing certain jobs. For example the working environment and conditions cannot always be pre-determined as weather conditions may change while a lifting and moving task is performed. The Rigger must therefore creatively adapt his/her work-flow to assure the symmetry of the job being completed as required. The ability to perform tasks as mentioned above, confirm the *Scarce Skills* of a Rigger Ropesman as *people with these skills are simply not available*.
- vii. The self-actualisation need is an intrinsic need that motivates the Rigger Ropesman to find self-accomplishment and success in executing tasks safely and timorously. The comprehension of his/her potential is realised during the planning, execution and review of tasks being completed.

Parr (2008:225,227) confirms that the motivational factors in any student, learner and person can be countless and varied. These factors influence their decisions to learn and perform in their adult learning environment, which in turn then influences their learning achievements. The Rigger Ropesman's learner achievement is to complete the learnership programme, including the final trade test, which will then enable the learner to be appointed as a qualified MQA Rigger Ropesman artisan. The next paragraph focuses on the MQA qualification of the Rigger Ropesman.

2.4 THE RIGGER ROPESMAN QUALIFICATION REGISTRATION WITHIN THE MMS AND MQA

In order to clarify the artisan trade and qualification in the Mining and Minerals Sector and MQA, this paragraph focuses on the actual qualification of the Rigger Ropesman. The MQA was established by the Mine Health and Safety Act of 1996, and was registered as a SETA in terms of the Skills Development Amendment Act (37/2008) as stated in the Sector Skills Plan (SSP) for the Mining and Minerals Industry (2009: xiv).

The Rigger Ropesman qualification amongst other qualifications was registered at SAQA to enable the SETA to supply skills to the Mining and Minerals Industry. The researcher was involved as Rigger Ropesman Subject Matter Expert (SME) at the MQA since 1997 during the registration phase of the qualification. The purpose of the qualification is intended for application in the mining industry, and has a primary operational application in the engineering field. The rationale for the qualification is validated because there is a critical need in the Mining and Minerals Sector for skilled persons who are able to conduct the essential operations associated with efficient and safe engineering maintenance, repairs, manufacturing and trouble shooting.

The MQA Rigger Ropesman qualification consists of Core and Specialisation areas, which consist of Exit Level Outcomes. The Core and Specialisation areas consist out of the following areas: specified outcomes, unit standard credits and associated assessment criteria. The compulsory (Comp) column indicates the tasks that must be completed before the Final Trade test can be performed. The various specialisation areas represent the different mining operations that provide training and development opportunities for the qualification.

Core (All specialisation areas of the qualification to complete the Core component)

Four Exit Level Outcomes are associated with the Core component

Exit Level Outcome 1: Identify and use engineering tools and equipment.

NQF Level: 3

Specified Outcome	Associated Assessment Criteria		Comp
Use basic hand tools Credits 14	CCD	Course Control Document	Yes
	DRG	Read Engineering Drawings	Yes
	ST	Safety	Yes
	LOP	Lock Out Procedures	Yes
Operate oxy-acetylene cutting equipment Credit: 4	OA1	Operate oxy-acetylene cutting equipment	Yes
Operate Grinders Credits: 4	MMG	Maintain a Pedestal Grinder	Yes
	PG	Use a Portable Grinder	Yes
Operate Welding Equipment Credits: 2	AW1	Perform Basic Arc Welding	Yes

Table 2.1: Identify and use engineering tools and equipment

Exit Level Outcome 2: Identify, inspect and use various types of ropes.

NQF Level: 3

Specified Outcome	Associated Assessment Criteria		Comp
Identify coil and inspect ropes Credits: 10	IR	Identify and coil ropes	Yes
	IFR	Identify faults in ropes	Yes
	CRW	Check wire rope for wear and damage	Yes
	ROR	Run out a rope from a drum	Yes
	PNH	Assist with preparing a non spin hoist rope (Test Specimen)	Yes
	HRTS	Prepare a hoist rope for test specimen	Yes
Tie knots, bends and hitches Credits: 7	KB	Tie knots and bends	Yes
	TH	Tie hitches	Yes
Protect ropes using various methods techniques Credits: 5	WH	Whip and seize ropes	Yes
	WO	Worm, parcel and serve a rope	Yes

Table 2.2: Identify, inspect and use various types of ropes

Exit Level Outcome 3: Lift and move loads using various methods and equipment

NQF Level: 4

Specified Outcome	Associated Assessment Criteria		Comp
Check and maintain lifting equipment and Rigging hardware Credits: 18	LM1	Check and maintain lifting equipment and Rigging hardware	Yes
	RB1	Reeve blocks	Yes
	RB2	Reeve blocks	Yes
	RRB-R	Reeve a rope on a rope block	Yes
	ESD	Examine single drum winches	Yes
	UL	Check and use ladders	Yes
	FCR	Fit clamps to steel wire ropes	Yes
	SDH	Inspect a safety detaching hook	Yes
	ESW	Assist with examining sheave wheels	Yes
	OC	Examine and use an Overhead Crane	Yes
	SMCI	Assist with surface Mobile Crane inspection	Yes
Erect and use Rigging hardware Credits: 12	ETP	Erect a temporary working platform	Yes
	TR	Erect and use a Tripod	Yes
	RP-R	Erect and use a Raised Pole	Yes
	AF	Erect and use an A-Frame	Yes
Lift and move machinery and equipment Credits: 10	LM2	Lift and move equipment	Yes
	LMM	Lift and move machinery and equipment	Yes
	LT	Lift and Turn a Load	Yes
	SL	Secure a Load for Transportation	Yes
	RRC	Rerail a Conveyance	Yes
	HG-R	Winch a load into a tower	Yes

Table 2.3: Lift and move loads using various methods and equipment

Exit Level Outcome 4: Splice various types of ropes.**NQF Level: 4**

Specified Outcome	Associated Assessment Criteria		Comp
Splice Manila rope Credits: 10	SMR	Splice a soft eye in a manila rope	Yes
	STM	Splice a thimble in a manila rope	Yes
	BSM	Splice a back splice in a manila rope	Yes
	SMG	Splice a manila grommet	Yes
	LSM	Splice a long splice in a manila rope	Yes
Splice steel wire rope Credits: 16	SWR	Splice a steel wire rope using the Liverpool method	Yes
	SSA	Splice a soft eye in a steel wire rope using the Admiralty method	Yes
	CSS	Splice a cut splice in steel wire ropes sling	Yes
	WG	Make up a steel wire rope grommet	Yes
	LSS	Make a long splice in two steel ropes	Yes
	SNR	Splice a non spin wire rope	Yes

Table 2.4: Splice various types of ropes

SPECIALISATION AREAS

Elective ~ Open Cast

There is one Exit Level Outcome associated with the Elective ~ Open Cast

Exit Level Outcome 1: Inspect and maintain conveyance equipment.

NQF Level: 4

Specified Outcome	Associated Assessment Criteria		Comp
Inspect and maintain conveyance equipment Credits: 26	CCB	Change conveyer belt	Yes
	ACV	Assist in changing a vibrating screen	Yes
	LTD	Lift and turn a dragline bucket	Yes
	RDB	Replace a dragline bucket	Yes
	LOC	Make a long splice in an overland conveyer	Yes
	HDR	Replace hoist and drag ropes on dragline	Yes
	SWD	Change sheave wheel on draglines	Yes
	TBME	Tow-in broken down mobile equipment	Yes
	TBUD	Turn bowl of truck up-side-down	Yes
	IOC-R	Assist with inspection of Overhead crane	Yes

Table 2.5: Inspect and maintain conveyance equipment

Elective ~ Surface/Underground

Specified Outcome	Associated Assessment Criteria		Comp
Examine winder ropes, attachments, sheave wheels/Conveyors, and assist with Shaft slinging Credits Comp: 11 Non Comp: 5	DER	Assist with daily examination of ropes	Yes
	EDH	Assist with examining detaching hook	Yes
	EMT	Assist with electromagnetic testing of ropes	Yes
	SWB	Assist with examining sheave wheel bearings	No
	CIC	Assist in cleaning inter / after coolers	No
	MIR	Assist with monthly inspection of ropes and shaft	Yes
	PHR	Assist with preparing a hoist rope test specimen	Yes
	WRD	Maintain waste rock dump conveyors	No
	SHS	Assist with slinging a hopper in a shaft	No
	SOE	Assist with slinging of equipment in shaft	Yes
HGS	Assist with replacing headgear steelwork	No	

Table 2.6 Examine winder ropes, attachments, sheaf wheels, conveyors. Assist with Shaft slinging and with maintaining winder ropes and equipment

There is one Exit Level Outcome associated with the Elective - Surface/Underground Generalist

Exit Level Outcome 1: Examine winder ropes, attachments, sheaf wheels, conveyors, assist with shaft slinging and assist with maintaining winder ropes and equipment.

NQF Level: 4

Specified Outcome	Associated Assessment Criteria		Comp
Assist with maintaining winder Ropes and equipment Credits Comp: 17 Non Comp: 3	CBE-R	Assist with cutting back ends	Yes
	CFE	Assist with cutting front ends	Yes
	CHR	Assist with changing hoist ropes on a winder	Yes
	CDB	Assist with changing drum bushes on a winder	Yes
	CWP	Assist with changing wrapper plates on a hoist	No
	CSC	Assist with changing skips and cages	Yes
	GHR	Assist with greasing a hoist rope	Yes
	SW-R	Assist with removing and replacing headgear sheaves	Yes

Table 2.7: Assist with Shaft slinging and with maintaining winder ropes and equipment

The Rigger Ropesman qualification consists of the following competency levels

The Knowledge, skills and values in order to display competency (applied competence) are demonstrated by the ability to:

- Understand advanced lifting and mechanical handling theory, principles and concepts, which include the interpretation of detailed work instructions in order to meet the requirements of mechanical handling projects;
- Manage/supervise/perform lifting and mechanical handling projects/tasks using a reference framework, which includes the view of the operating environment as a system within a wider context;
- Demonstrate integrated organisational skills in order to manage personnel in the supervision of lifting tasks;
- Apply and carry out actions by interpreting information from text and operational symbols or presentations, and
- Use knowledge of the mechanical handling (Rigging) field of expertise to solve common problems within a familiar context, making adjustments or small changes to the application of common solutions within known parameters (SAQA, 2008:1).

Rigger Ropesman learners at NQF Level 4 who perform Rigging work, require the following skills:

- Highly developed mechanical orientation with associated diagnostic skills;
- Specialised organisational skills (evaluating, planning and scheduling work);
- Communication skills, and
- Team and leadership skills SAQA (2008:2).

The above knowledge, skills and values are included into the specific engineering trade and indicate the responsibility of the Rigger Ropesman as artisan within the Mining and Minerals Industry. The international comparability of the qualification formed part of the structure development of the qualification. The essentials are the same status of the qualifications in England where the learning is a combination of work-based (on the job) and training provider (off the job) learning, to meet the qualification requirements according to Doel (2011:49).

The credits of the Rigger Ropesman qualification in South Africa consist of:

Credits and rules of combination

Candidates for a **National Certificate Rigger Ropesman ~ NQF Level 3** must achieve the credits as per the following summary:

Core

All **112** credits attributable to the exit level outcomes as identified under core to all specialisation areas:

Elective

All credits attributable to the exit level outcomes as identified, relevant to one of the following specialisation areas for **National Certificate: Rigger Ropesman**

- Surface/Underground
- Open Cast

Summary of the NQF credit composition for the Rigger Ropesman qualification

CORE	ELECTIVE	TOTAL
112	36	148

Table 2.8 Specialisation area 1: Surface / Underground Mines (Generalist).

CORE	ELECTIVE	TOTAL
112	26	138

Table 2.9 Specialisation area 2: Opencast Mines

It is visible that the Rigger Ropesman qualification fulfils all the applicable prerequisites of a registered SAQA qualification. The qualification SAQA registration details are:

SAQA QUAL ID: 59729 QUALIFICATION TITLE: Mechanical Handling (Rigging)

The qualification is registered under the title: Mechanical Handling (Rigging) at SAQA. It corresponds with other engineering qualifications that were registered in similar terminology such as Mechanical Handling (Fitter); Mechanical Handling (Plater Boilermaker).

The MQA SSP for the Mining and Minerals Industry 2011 Accreditation terminology reads as follows:

DoL Re MQA Accreditation Number: 16Q160009001273 R

The other two examples of trades at the MQA are identified as:

1. Fitting (including Machining) and
2. Plater Boilermaker MQA SSP (2011:147).

In the next paragraph, the numbers of Rigger Ropesman learners in comparison with other engineering trades within the Mining and Minerals Industry will be highlighted.

2.5 THE RIGGER ROPESMAN LEARNERS IN COMPARISON WITH OTHER TRADES WITHIN THE MMI

The Rigger Ropesman trade's learner numbers is one of the questions asked in the interviews to find possible answers why the numbers are lower than other artisan trades such as Electrician, Fitter, Diesel Mechanic, MC & I, Plater Boilermaker in the Mining and Minerals Industry. The following section indicates the realism of the above phenomena.

The MQA reported that the following learnerships were completed from 2003 until 2009 in accordance with the MQA SSP (2011:149).

Table 2.10 indicate the abovementioned statistics.

National Certificate Qualification	NQF Level	2004	2005	2006	2007	2008	2009	Total
Diesel Mechanic	3	10	22	63	115	103	52	365
Electrical	4	25	56	79	247	291	173	871
Fitting (including Machining)	3	10	32	66	137	186	97	528
Instrumentation Mechanician	3	4	5	5	46	49	27	136
Plater Welder	3	0	12	49	66	64	44	235
Rigger Ropesman	3	2	1	4	17	16	10	48
Total		55	117	266	628	709	403	2183

Table 2.10: Learnerships completed: 2003 to 2009 according to qualifications.

Source: MQA Data system as on 24 August 2010

The above information in (Table 2.10) clearly indicates the minority numbers of the Rigger Ropesman learners qualified during this period.

The total number of learners qualified was 2183 of which only 48 were Rigger Ropesman. This calculates to only 2.19%.

The following figures confirm the MQA Learnership enrolments (2004 until 2009) as indicated in the MQA SSP (2011:150):

National Certificate Qualification	NQF Level	2004	2005	2006	2007	2008	2009	Total
Diesel Mechanic	3	125	113	185	251	190	184	1048
Electrical	4	266	304	438	658	643	547	2712
Fitting (including Machining)	3	159	206	282	440	363	257	1707
Instrumentation Mechanician	3	45	41	66	102	110	69	433
Plater Welder	3	120	122	168	205	132	109	836
Rigger Ropesman	3	9	18	46	36	45	17	171
Total		724	804	1185	1692	1483	1183	6907

Table 2.11: Learnership enrolments; 2004 to 2009 in relation to their qualification

Source: MQA Data system as on 24 August 2010.

The total number of learners enrolled during this period was 6097 of which only 171 were Rigger Ropesman. The number calculates to only 2.47%. It is evident that the number of learners enrolled and those who have completed their learnerships as Rigger Ropesman are below 3% of the total engineering learners reviewed in this group of MQA learners over this period.

The researcher is involved with Rigger Ropesman learners at Anglo American Platinum and has access to this related information. The information is managed by the Learnership Manager who is responsible for MQA registration and SETA administration functions at the Engineering Skills Training Centre in Randfontein. The learners are enrolled by the different mines in the geographical areas of the North West, Mpumalanga and Northern provinces. The learners attend their off-the-job learning provider training at the Engineering Skills Training Centre (ESTC).

Table 2.12 present an overview of the midyear June 2010 intake at different operations of Anglo American Platinum.

National Certificate Qualification	NQF Level	Amandelbult	Mogalakwena	Rustenburg	Twickenham	Union	Mototolo Concentrator	Rustenburg Concentrator	Polokwane Smelter	Waterval Smelter	Precious Metal Refineries	Base Metals Refineries	Total
Auto Electrician	3	0	2	0	0	0	0	0	0	0	0	0	2
Diesel Mechanic	3	1	3	1	0	1	0	0	0	0	0	0	6
Electrical	4	2	1	3	0	3	0	1	0	1	0	1	12
Fitting (including Machining)	3	2	0	3	0	3	1	1	1	1	1	1	14
Instrumentation Mechanician	3	1	0	1	0	0	0	0	0	0	0	0	2
Plater Welder	3	2	1	2	1	2	0	1	0	1	1	0	11
Rigger Ropesman	3	1	0	1	0	1	0	0	0	0	0	0	3
Total		9	7	11	1	10	1	3	1	3	2	2	50

Table 2.12: Anglo American learnership intake June 2010

Source: ESTC Learnership Mid-Year Report June 2010

The Anglo American Platinum learnership intake concluded that there were a number difference when the Rigger Ropesman numbers were compared with other similar engineering trades.

The above information regarding learnership enrolments and learnerships completed from the MQA and Anglo American Platinum confirm the relevance of the following research questions:

- To what extent does the training and development of Rigger Ropesman learners vary from the training and development of other similar engineering trades' learners?
- If such a variance exists, what are the contributing factors?

The rationale of this research is to determine how the following questions affect the nature of the training and development of the said Rigger Ropesman learner:

- Which contributing factors cause possible variances when comparing the learners' training and development to other similar engineering trades in Anglo Platinum and Mining and Minerals Sector?
- Are the training and development provided for the Rigger Ropesman learner of equal quality as the training and development provided to other similar engineering trades?
- Does the earning potential of other trades have a bearing on the selection of the Rigger Ropesman?

2.6 LITERATURE PERTAINING TO THE TRAINING AND DEVELOPMENT OF LEARNERS IN THE MMS

The purpose of the section is to provide clarity regarding the processes and literature used to train and develop learners and artisans in the Mining and Minerals Sector. Creswell (2009:26) is of the opinion that the literature review should be brief and that it should summarise significant literature on the research problem. Mouton (2008:87) clarifies the purpose of a literature review as follows:

- To ensure one does not merely duplicate a previous study.
- To determine the most recent and authoritative theory about the subject.
- To determine the most widely accepted empirical findings in the field of study.
- To identify available instrumentation with proven validity and reliability.
- To ascertain the most widely accepted definitions of key concepts in the field.
- To save time and obtain clues and suggestions in terms of avenues to follow in the study.

A good literature review does not merely report the related literature but also evaluates, organises and synthesises what has been done in the relevant literature as confirmed by Leedy and Ormrod (2005:77). This review will include literature referring to SETA's response on the scarce skills, as specific trade research studies could not as yet be established. The FASSET Scarce Skills Guide (2008/2009:1) states, that to ensure a healthy and blooming economy, skills shortage must be attended to as skills development is a catalyst to provide a productive and wealthy nation. The MQA Scarce and Critical Skills Guide (2008-2010:6) confirms the national focus on scarce and critical skills was attended to during 2000, when the Skills Development legislation was adopted as the key mechanism for bringing about a skills uprising in the country.

This was done in order to raise the skills base to levels required to support economic growth and social development.

One of the main roles of the SETAs is to address skills shortages in their different sectors. The MQA Scarce and Critical Skills Guide (2008-2010:6) clarifies tools and mechanisms (WSP/SSP) to identify skills required at national, sectoral and company level. These tools are designed to enable the following:

- Identify national and economic sector gaps (shortages) in the availability and delivery of skills for occupational competence and enterprise performance.
- Implement national and economic sector skills development initiatives and strategies to address these gaps through training. This includes: qualification and unit standard development; learning programme and assessment development; and quality of learning and training system improvements.

The focus should be on “critical scarce skills”, which acts as a binding constraint on the country’s ability to achieve its economic growth target of 6% by 2014 and halve unemployment and poverty by 2014. This target was referred to by the then President of the Republic of South Africa, Mr Thabo Mbeki, in his State of the Nation Address for 2004. The national apprehension with scarce and critical skills is suitably revealed in the National Skills Development Strategy (2005-2010). This has become a key focus for SETA and NSF skills development planning and delivery/implementation initiative.

The MQA Scarce and Critical Skills Guide (2008-2010:6) recognises the following two key responsibilities regarding the identification and reporting of scarce and critical skills across the sector:

- Provide a reliable set of skill shortage signals to the sector and
- Direct strategic training and development interventions and activities to address these shortages.

The most commonly used international indicators that can be measured to determine the existence and severity of skills shortages are highlighted by the MQA Scarce and Critical Skills Guide (2008-2010:10). These indicators are as follows:

1. Vacancies fill rates, i.e. the duration of time it takes to recruit and fill a vacancy.
2. Vacancy volumes, i.e. the number of same vacancies at industry, sector or national level.
3. Wage pressures, i.e. wage inflation to fill vacancies from a small pool of suitably skilled people.
4. Labour market competition, i.e. pull to other sectors or countries.
5. Same skills demand maintained over time, i.e. industry growth projections.
6. Information about the length of time it will take to educate and train the identified skills shortage.
7. Information about the reaction of the industry to address the identified skills shortage.
8. The role training and development interventions play.

Although indicators 1 – 5 and 7 have direct bearing on HRM issues it is important to note their impact in relation to the training and development of the Rigger Ropesman learner. Indicators 6 and 8 have direct impact on the training and development of the Rigger Ropesman learner and will as such form the focus of this study. These indicators will be used to prepare interview questions to determine the reaction of the Anglo Platinum mining industry to the identified skills shortage in the Rigger Ropesman trade.

According to the MQA Scarce and Critical Skills Guide (2008-2010:13), the following occupations would be direct strategic interventions to address the skills shortages:

- Core skills occupations that are essential to the business and without which the organisation cannot perform;
- Support skills occupations that include corporate services, human resources and engineering maintenance services,
- Priority skills occupations that is essential to economic growth.

The Rigger Ropesman occupation supports the above strategic interventions and thus becomes an integrated participant in the sector. This study will attempt to confirm the importance of the Rigger Ropesman learner to the sector by investigating the core, training, support and priority skills of this occupation.

This research study could not yet confirm any other literature regarding the ratio training and development of the Rigger Ropesman, Electrician, Fitter, Diesel Mechanic, MC & I, Plater Boilermaker. Therefore, the data and documents stating the numbers of engineering individual trades training and development will be utilised to confirm the ratio difference within Anglo Platinum and the MQA. The reasons for ratio differences will then be investigated referring to the various causes of the ratios. This particular Rigger Ropesman trade research study has not been performed previously. The study of this occupation will focus on processes such as training interventions, procedures, and trends applied during the training and development of the learners that could generically assist all other trades.

The literature study will collect data as described by Leedy and Ormrod (2005:89), to develop the primary data or literature that is the most valid, most illuminating and most truth-manifesting. Mouton (2008:88) confirms the main strategy for searching literature by asking the following question: "What are the main information sources that you need to access and where do you locate these sources?"

A literature review of recent and relevant literature sources indicates that literature in artisan training and development ratios and scarce skills can only be found in articles, training reports, WSP's, SSP's and SETA Scarce and Critical Skills Guides. Specific research into scarce skills has been addressed generically to the SETA sector's demands and needs. Throughout HRD studies consulted to date, many strategies for addressing critical and scarce skills are provided while no further exploration is made regarding particular occupations. Databases including Internet search engines such as Google Scholar and Skills Portal, together with relevant Anglo American, SAQA and SETA websites will be used to identify relevant literature sources. The aim is to determine the following: developments related to artisan training; development comparisons; and scarce skills.

The following key words will be used in the searches: artisan, apprenticeships, training and development ratios, learnerships, training, development, skills needs analysis, scarce skills, trades and trade test. According to the DoL (2008:8), artisan development has been divided since 1981 into two systems with regard to artisan formation:

System 1: Section 13 (S13) of Chapter 2 of the Manpower Training Act of 1981. These are persons who have been formally indentured as apprentices. They meet the age criteria, complete the described tasks and time frame, and pass the trade test as prescribed by the Act (DoL 2008:8).

System 2: Section 28 (S28) of Chapter 2 of the Manpower Training Act of 1981. These are usually adult persons who did not register as apprentices under Section 13. They work in the specific artisan trade to gain experience over an adequate period of time as specified in the act. They have obtained a particular NTC qualification level in the same trade. They then apply to undergo the trade test and if they pass they become artisans (DoL 2008:8).

The Department of Labour through its Artisan Development Coordinating Committee has announced **four routes** people could take to train as artisans. These routes were gazetted in December 2007 for public comment before they were being legislated. The four routes are explained in the Scarce and Critical Skills Research Project commissioned by the Department of Labour South Africa March 2008.

The four routes to be trained as artisans are as follows:

2.6.1 The Recognition of Prior Learning (RPL) route

2.6.2 National Certificate Vocational (NCV) Internship Programme Route

2.6.3 The learnership route

2.5.4 The apprenticeship route

An overview of the RPL, NCV and Internship routes will be set out next. This will be followed with a more detailed explanation of the apprenticeship and learnership routes for this study.

2.6.1 Recognition of Prior Learning Route (RPL)

The DHET INDLELA RPL Unit published a document: NAD-RPL Proposed Model Framework V7 – 18 April 2012; (1-10p), which sets out the following regarding RPL plans made in South Africa: *“The Artisan and Technician Development Technical Task Team (ATD-TTT) that is a stakeholder representative body established by the Human Resource Development Council (HRDC¹) of South Africa has included in its work plan as a key priority the recognition of prior learning (RPL) of persons who have over a number of years become knowledgeable and experienced in an artisan trade.”*

¹ The HRDC was established on 30 March 2010 by the Deputy President of South Africa to facilitate conditions that promote optimum participation of all stakeholders in the planning, stewardship, monitoring and evaluation of HRD activities in the country.

The Proposal Model has been developed by INDLELA and NAMB with inputs from (ATD-TTT) and can be implemented in economic sectors. The detail of this proposal and model can be viewed in the NAD-RPL Proposed Model Framework V7 – 18 April 2012. The above Proposal Model imparts that: *“RPL is a method of assessment that evaluates the person’s prior learning and skills against an approved national standard. The three main stages in Artisan RPL are: Advising, Assessing and Moderation performed by (NAMB).”*

A learner registers as **Recognition of Prior Learning (RPL) Learner** with the Institute for the National Development of Learnerships, Employment Skills and Labour Assessment (INDLELA) against a trade listed in the Government Gazette No.35625 31 August 2012. The DoL further stipulates that the learner spends a pre-determined period on a single RPL process that ends in a Trade Test (DoL 2008:7). The RPL process will guide the learner in compiling a Portfolio of Evidence (POE) to be Assessed and Moderated by NAMB. The specific Trade Test must then be successfully completed where after artisan registration can take place. The RPL route is based on the historic practices Manpower Training Act. 1981 (Act No 56 of 1981) Chapter 2, Section 28.

2.6.2 NCV Internship Programme Route

A learner enrolls at a Further Education and Training (FET) College and completes the National Certificate Vocational (NCV). The learner then registers an Internship with a SETA on an NQF registered artisan trade qualification that spends a pre-determined period in the workplace on a Single Internship contract as described by DoL (2008:7). As outlined above, the tasks in the contract and the specific Trade Test must first be successfully completed before artisan registration may take place. The internship or skills programme is a new initiative at FET colleges since January 2007. The NCV programme offers NQF Level 2, 3 and 4 with year duration per level.

2.6.3 Learnership Route

Current policy in South Africa seeks firstly to bring education and training in line with what is deemed required to successfully compete in the global economy. Secondly, current policy seeks to eradicate previous unequal provision by means of a series of reforms aligned with a broader national human resource development strategy.

The title of the strategy is: “*A Nation at Work for a Better Life for All*” as stated by DoL (2001). As confirmed by Gamble (2004:14), a new form of apprenticeship, known as a learnership, has been introduced in South Africa to give people who are already employed, as well as those who are unemployed, access to a combination of structured learning and practical work experience that is deemed as an extension of previous systems of apprenticeship. A learner registers for a learnership with a SETA on a NQF registered artisan trade qualification by signing a learnership agreement with the SETA accredited employer and training provider, as stipulated by DoL (2008:7). The duration of the learnership is between two and four years depending on the specific trade registration. The training consists of an on-the-job practical exposure and an off-the job training centre phase. The minimum theoretical qualification required at a FET college is N2, which includes four subjects of which Mathematics and Science are compulsory. The learnership programme must be completed and declared “Trade Test Ready” by the relevant SETA before a Final Trade Test can be executed and registration as an artisan can take place. The learnership route was established through the Skills Development Amendment Act (Act 37 of 2008).

2.6.4 Apprenticeship Route

According to Coetzee *et al.* (2007:175) an apprenticeship is a structured learning programme that leads to a nationally recognised qualification on the National Qualifications Framework. The Amendment of the Skills Development Amendment Act, (37/2008) Section 1(a) defines apprenticeship as a “**learnership**” in respect of a listed trade, and includes a trade test in respect of that trade” (2008:2).

Coetzee *et al.* (2007:400) explains that a learnership/apprenticeship is a learning programme that leads to a nationally recognised qualification on the NQF. Furthermore, it is an integrated, occupation-directed programme that combines learning at a training institution off site (40%) with responsibility and with practical on-site experience and learning (60%). The Anglo American Platinum Engineering Training Philosophy supports the above combination of learning per se and demonstrates its application in Table 2.13 below.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">OFF SITE – TRAINING PROVIDER AREA OF RESPONSIBILITY</p> <p style="text-align: center;">40%-</p>	<p>COMPETENT:</p> <p>Fully assessed by registered assessor in actual working conditions against pre-determined standards and identified risks, including Anglo Fatal Risk Standards (AFRS).</p> <p>E.g. Trade Test, Summative Assessment.</p> <p>CAPABLE</p> <p>Trained but not assessed under above conditions. E.g. Assessment of training module, Formative Assessment.</p>	<p>HRD FUNCTION</p> <p>Theory - 30%</p> <p>Practical – 70%</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">ON SITE – OPERATIONAL AREA OF RESPONSIBILITY</p> <p style="text-align: center;">60%</p>	<p>COMPLETE:</p> <p>Coaching</p> <p>Mentoring</p> <p>Continuous evaluation under (AFRS)</p> <p>Empowered in work area</p> <p>Appointed by Engineer as competent as per Mine Health and Safety Act after Trade Test has been completed successfully.</p>	<p>LINE SUPERVISOR FUNCTION</p> <p>In actual workplace</p> <ul style="list-style-type: none"> • Safety / production area • Experience / cost control <p>Reflecting</p> <ul style="list-style-type: none"> • Various conditions • Culture of leadership style • Team performance • Superiors / Subordinates

Table 2.13: The Anglo American Platinum Engineering Learner Training Philosophy

2.7 THE MQA 7 STEP PROCESS AND MODEL TO BECOME AN ARTISAN

The MQA Standards Generating Body (SGB) approved during 2011 the following seven step process to become an artisan. The objective is to regulate and coordinate the Recognition of Prior Learning (RPL) process for learners or candidates during the qualification process. Training providers will be randomly audited within the following RPL scope:

- Learners exempted for N2 subjects in accordance with MQA N2 Knowledge Matrix.
- Learners who accessed Trade Test via the Equivalency Analysis Matrix – without exemption from Mining Apprenticeships Committee.
- Learners who completed Trade Test in the 2011/2012 financial year.

The MQA 7step model to become an artisan is presented in figure 2.2.

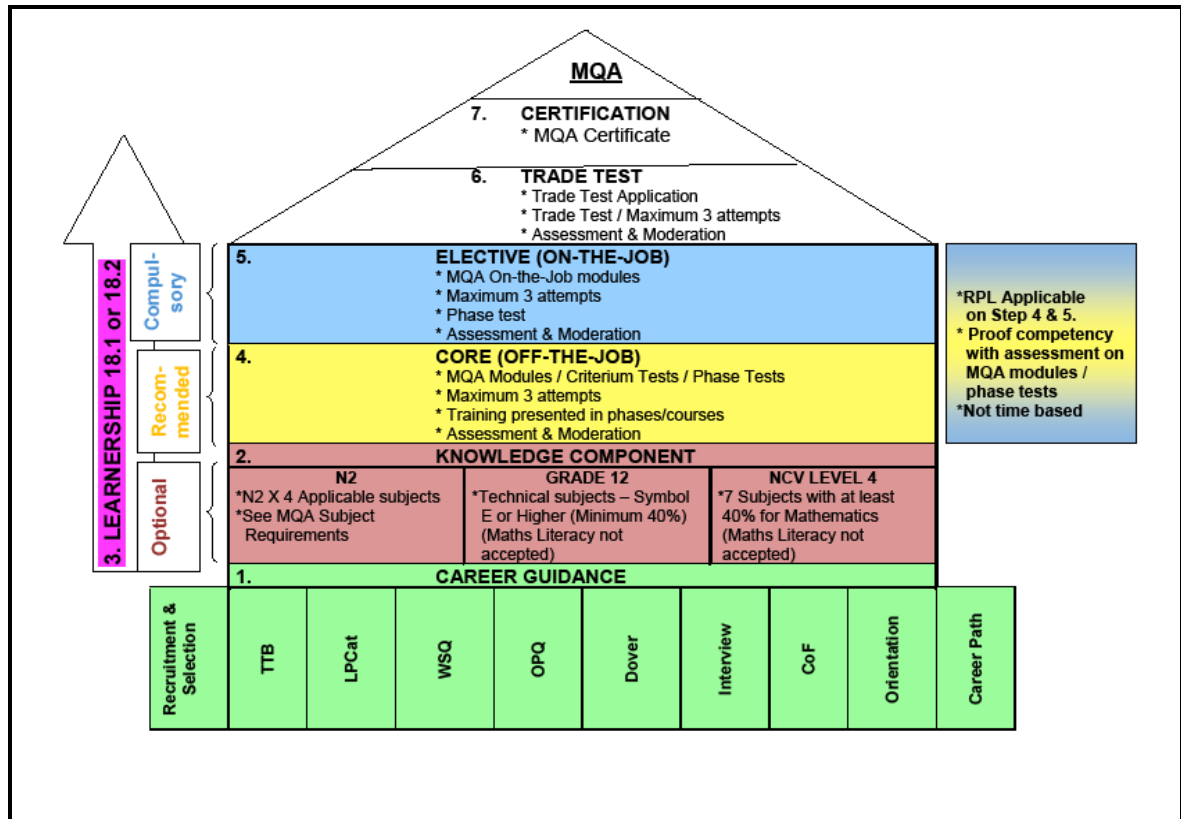


Figure 2.2: The MQA 7 step process to become an artisan

The MQA provided and recommended the use and application of the seven step artisan development model and process to ensure that all training providers adhere to the Skills Development Amendment Act 2008. (Act of 37 of 2008) Section 13. The seven steps show that all critical documents that govern the tasks and duties of all relevant parties in the development process must be in place. The parties include: The learner, employer, training provider, MQA, and the on the job training centre. The process is continually checked and verified during the learnership to ensure that all pre-requisites and criteria are met before the trade test is approved. The 7 step artisan development model is presented in figure 2.3.

SGB APPROVED 7 STEP MODEL				
MQA 7 STEP ARTISAN DEVELOPMENT PROCESS FOR SECTION 13 & RPL CANDIDATES				
STEP	DESCRIPTION	DOCUMENTS	DATE COMPLETED	SIGNATURE
STEP 1	CAREER GUIDANCE	ASSESSMENT & INTERVIEW		
		PERSONAL DETAILS – Biography, ID, Banking Details		
		ORIENTATION		
		CERTIFICATE OF FITNESS		
		SAP (OR INTERNAL COMPANY CAPTURING SYSTEM)		
STEP 2	KNOWLEDGE COMPONENT	Language: Grade 10		
		N2 Mathematics & Science		
		N2 Two other Trade Related Subjects		
STEP 3	LEARNERSHIP CONTRACT	18.1 / 18.2 : From 20 ___/___/___ to 20 ___/___/___		
		LEARNERSHIP AGREEMENT NO:		
STEP 4	CORE TRAINING (Off-the-Job)	SKILLS PROGRAM (Two Party)	LEARNERSHIP (Three Party)	
		Phase 1 : 20 ___/___/___	Phase 1 : 20 ___/___/___	
		Phase 2 : 20 ___/___/___	Phase 2 : 20 ___/___/___	
		Phase 3 : 20 ___/___/___	Phase 3 : 20 ___/___/___	
STEP 5	ELECTIVE TRAINING (On-the-Job)	PHASE 4 – MQA Modules : 20 ___/___/___		
		PHASE 5 – Optional Exposure : 20 ___/___/___		
STEP 6	TRADE TEST	PHASE 6 - TRADE TEST – Application – MQA document		
		TRADE TEST Date Passed : 20 ___/___/___ Results on File		
		JOB – Yes / No Placement:		
STEP 7	MQA CERTIFICATION	RECEIVED MQA CERTIFICATE : 20 ___/___/___		

Figure 2.3: The MQA 7 step artisan development model

The above initiative from the MQA influences the quality of training and development from a SETA and Employer’s perspective. The target is to cooperate and contribute to the aim of the Skills Development Amendment Act 2008. (Act 37 of 2008) to “develop and improve the skills of the South African workforce”. The other party involved in this tri-partite training and development intervention is the learner. The next paragraph will attend to the learner’s profile before, during and after completion of the learnership.

2.8 THE PROFILE OF THE RIGGER ROPESMAN DURING HIS/HER LEARNERSHIP

The profile of the learnership entails all learning activities of the learner during the learning phase. The learner undertakes a development programme when they enrol as learners. This new pathway influences the learner's development as an individual, as well as his or her levels of competence, demographics, characteristics, ETD needs, and adult motivations in the aim of becoming a qualified artisan. As affirmed by Coetzee *et al.* (2007:400), all these levels form part of the learner's profile. The learner's profile experience continuously changes as the learner makes progress before, during and after the completion of the learnership.

The Anglo American Platinum learnership training provider, namely the Engineering Skills Training Centre (ESTC), issues a document/booklet to the learner titled "Portfolio of Evidence (POE)". The content of this POE is the reflection or signed off evidence of the progress made by the learner during his/her learnership programme. The POE is contains the profile of the learner as explained below:

Division A

Induction / Welcome to Anglo American Platinum

The learner is welcomed at ESTC. The vision and purpose of the Operational Skills Development (OSD) is explained to the learner. Safety awareness is highlighted. The learner is requested to assure his/her understanding of the Conditions of Employment as well as the Learnership Agreement that must be undersigned where after the learner receives a copy of the documents. The background of the MQA as well as the Mines Health and Safety Act 1996 (Act 29 of 1996); Skills Development Amendment Act 2008 (Act 37 of 2008); and South African Qualifications Act 1995 (Act 58 of 1995) are discussed with the learner.

The Learner's role

The learner is informed of his/her responsibility regarding the POE. The POE must be continuously updated, available and signed by the relevant Learnership Supervisor, HRD Coordinator, HRD Officer, Coach/Artisan, Assessor and Moderator at the appropriate interventions. The learner's profile is dealt with when the learner is working at the various sites. The different expectations at the sites or operations require the learner to adapt his/her profile regarding the specific rules and standards at the different sites. This includes working hours, PPE, and different tasks at the various sites or operations. The learner must take responsibility and interest to ensure that he/she attains the required exposure and experience as specified in

the POE, On the Job Training Manual and Phase Test material. The role of the Coach/Artisan is clarified to the learner, including his/her expected profile, as guided by his/her behavioral practices.

The assessment process is fully explained to the learners. This ensures that learners understand the process of learning, training and practice (to achieve competence) before they are assessed on tasks.

The typical development route explains to the learner what the two to three year development programme contains. The different phases will guide the learner in modifying his/her profile as he/she develops during the process as a learner. An overview of the typical development route is explained to the learner to ensure that the perspective of the programme is clear.

Division B

- **Phase 1 at the Training Provider (ESTC)**

This phase consists of basic knowledge and skills training provided by the training provider namely the Engineering Skills Training Centre (ESTC). Duration will be ± 26 weeks.

- **Phase 2 at the College**

The Learner Coordinator on the mine decides whether the learner needs to register at the FET to obtain the required subjects on NTC2 level. The duration at college is ±18 weeks. If the learner provides evidence of having acquired the relevant subjects, the next On the Job phase starts immediately.

- **Phase 3 at the Mine / Operation / Section**

This phase consists of applying the basic knowledge and skills that the learner obtained during Phase 1 at ESTC. Exposure and training in the additional On the Job tasks are attended to by the learner. There is no specific time frame coupled to this phase because it is outcome base driven and will depend on the individual's performance.

In order to continue with Phase 4 at ESTC it will be required from the learner to be deemed competent in all the on the job exit level outcomes. The average duration for this phase is 18 weeks.

- **Phase 4 at the Training Provider (ESTC)**

During this phase the learner will be trained in advanced knowledge and skills pertaining to the specific trade discipline. The learner starts his/her 2nd year in the learnership programme during this phase. This will result in a profile change due to the progress made

by the learner in this programme. The duration of the advanced training programme in phase four is \pm 32 weeks.

- **Phase 5 at the Mine / Operation / Section**

During this phase it will be expected from the learner to adapt his/her profile again to perform more complex tasks. After familiarising themselves with the equipment and environment he/she will conduct the same tasks as that of an Artisan such as planning, preventative maintenance and breakdowns.

The learner will then be working in a section where he/she will be appointed as an Artisan for approximately 32 weeks. This phase is to assist him/her to obtain all the experience and to prepare him/herself for the future as an Artisan. This phase is described as the "*Workplace Readiness Programme*".

In addition to the above it is the responsibility of the Operation / Section to determine the site specific tasks. These tasks must include Planned Task Observation (PTO) on specific work instructions. Before the completion of the phase (\pm 32 weeks) a summative assessment (theoretical/verbal interview) will be conducted. This must be completed before the learner can proceed to Phase 6 at ESTC. The assessment will be conducted by a panel consisting of the Engineer, Foreman, Artisan, HRD Officer / Coordinator, Assessor and Moderator. In addition to the panel assessment, the learner will submit a Portfolio of Evidence (POE), which will be assessed and moderated for completeness and readiness for the Trade Test.

If the panel is satisfied with the assessment outcomes the learner will be scheduled to attend Phase 6 at ESTC. In the event of the learner deemed not yet competent, the learner will be notified of the competency gaps and training needs. The re-scheduling for an assessment will subsequently be communicated to the learner.

Phase 6 at Training Provider (ESTC)

During this final phase the outstanding training will be completed and the learner will be scheduled to complete his/her trade test. The duration of this final phase is between 6 to 8 weeks. The current MQA trade test duration is one day. The new national trade test for all SETAs will be scheduled for two days. The profile of the learner exposes the learner to the summative assessment process in the learnership programme.

Division C

Progress planner

The progress planner gives the learner the opportunity to plan his/her profile during his/her learnership development programme over the full duration of the learnership programme. The learner completes the planner individually to encourage his/her understanding and sense of responsibility in the programme.

Division D

Introduction of the Learnership Programme

The learnership programme is briefly introduced to the learner. Learnership terminology is explained.

Division E

The Course map of the programme

The course in flowchart format clearly indicates to the learner the process to be followed from the start to the completion of a module.

Division F

Learnership Implementation Criteria

The learnership implementation criteria are scheduled in Personal Progress Summary format and guides the learner through his/her profile. The profile is to be completed at the mine before he attends his/her Off the Job training at the training provider.

Division G

Off the Job Progress Plotters

This division in the POE indicates the learner's progress at the training provider during the learnership programme. The modifications in the learner's profile become visible as the learner develops from basic tasks in the first year to advance training in the second year, to final completion of the learnership in the third year.

Division H

On The Job Development Monitoring Document

The On the Job Development Monitoring Document indicates the larger component of the learnership programme where the learner is exposed to and completes several tasks at different sections on the mine. This experience is essential as the learner must complete certain compulsory modules to enable him/her to be declared Trade Test ready. The dates

of these modules are captured on the MQA database as part of the learner's training evidence.

From the above it is clear that the learner's self-image and profile will go through several modifications during his/her growth and advancement in the learnership. The adulthood development contributes to the character growth and development of the learner.

2.9 THE RETURN OF INVESTMENT FOR THE MMI TO PROVIDE TRAINING AND DEVELOPMENT FOR THE RIGGER ROPESMAN LEARNERS AND ARTISANS

The return of investment regarding the training and development of the Rigger Ropesman in the Mining and Minerals Industry (MMI) entails the evaluation to ensure the legitimacy of the learning interventions devoted on the candidate.

2.9.1 Return on Investment (ROI)

The return of investment regarding the training and development of the Rigger Ropesman in the Mining and Minerals Industry (MMI) entails the evaluation process to capture the contribution to ETD in assuring that training adds value to the organisation. Meyer (2004:255) focuses on the rationale for evaluation of training in organisations and analyses the key roles of measurement and evaluation to ensure that ETD is a true business partner with the organisation. The outcome of the learning intervention of the Rigger Ropesman is part of the value added to the organisation and the MMI's reflection on the skills and abilities of the artisan.

According to Phillips (2005:1) "*The Human capital theory explores the ways individuals and society derives economic benefits from investment in people*". Coetzee *et al* (2007:402) defines return on investment (ROI) as "*the amount of money an organisation makes after subtracting the cost of training or other ETD or organisational interventions*".

To ensure the legitimacy of learning interventions devoted on the candidate, the ROI process focuses on the rationale for evaluating training in organisations. Meyer (2004:255) explains that the ROI process analyses the key roles of measurement and evaluation to ensure that ETD is a true business partner with the organisation. The outcome of the learning intervention of the Rigger Ropesman is part of the value added to the organisation and the MMI's reflection on artisan's skills and abilities. Phillips (2005:20) point out that these artisan skills and abilities are

important factors to sustain within the Mining and Minerals Sector and mining organisation in that such skills help to avoid staff turnover consequences such as work disruption, lost productivity, replacement costs, quality problems, and expertise loss. Within Anglo Platinum a learner has to attend a summative assessment that includes a theoretical/verbal interview. This will ensure that the learner is ready for his/her final Trade Test Phase and clarify that the learner is knowledgeable and experienced within the section in which he/she will be appointed as the responsible artisan. This process motivates the learner to successfully complete the Trade Test. Furthermore, the process indicates indicate that the learner will return to the specific job opportunity, which will, in turn, reduce staff turn-over and replacement cost. The replacement cost of a MQA qualified Rigger Ropesman includes recruitment, advertising interviews, pre-employment examinations (occupational and medical fitness), travel expenses, relocation expenses, administration and management time (Phillips, 2005:20).

The question might be asked why the Mining and Minerals Sector has to get involved in the training and development process of Rigger Ropesman artisans, with the argument that other SETAs like the Merseta and Construction SETAs also train and develop these artisans. The rationale is that when the qualifications of the other SETAs are compared with the qualification of the MQA, the tasks and circumstances of the underground mining artisan turn out to be completely different in context when it is compared to those of the surface industry orientated artisan. An example in this regard is: Installing a pump in a pump chamber underground using eye-bolts and chain blocks. On surface this is done by Mobile or Overhead cranes. Another typical scenario is the Maintenance and installation of mine winder ropes on conveyances, which are not dealt with in the other industries. It is therefore understandable that mining organisations will have to embark on re-training Rigger Ropesman artisans who have been qualified in the other SETAs. This is necessary since these artisans would not have the required mining competencies.

Coetzee *et al.* (2007:402) defines ROI as “*the amount of money an organisation makes after subtracting the cost of training or other ETD or organisational interventions*”. It is evident that the human capital expenditure on a Rigger Ropesman learner during his learnership must be gained by the company after the learner qualifies. The learnership programme can therefore be viewed as a total cost to the organisation as it includes costs such as: Learner salary, Training provider (ESTC), College educational subjects for N1& N2, and on the job training cost. This cost may vary per learner depending on the qualification and learner’s learning progress. Obviously, if the learner has to repeat subjects and learning tasks the cost would escalate.

2.9.2 Different ROI models

The cost – benefit analysis is based on the assumption that we can attach monetary value to everything which includes the training and development of staff members as emphasised by Neuman (2011:35). The ROI models referred to in this study deal with the monetary value a mine receives when investing in their Rigger Ropesman staff training and development.

Meyer *et al.* (2007:465-471) outlines the following HRD evaluations and ROI models:

- Kirkpatrick's model identifies four levels, namely Reaction, Learning, Behaviour and Results. The model identifies results in quantifiable terms such as improved quality, reduced accidents, higher profits etc. These terms limit the ROI perspective for this study with the intention to link monetary value to ROI as stated in Phillips five-level ROI framework.
- Warr, Bird and Rackman's CIRO model names four levels: Context evaluation, Input evaluation, Reaction evaluation and Outcome evaluation.
- The South African ROI model and implementation process include the following: ROI focus, ROI Planning, Gap analysis, WSP, Learning cost, Training session, Assessment of learning, Calculation of ROI, Evaluate training impact, Communicate results and Training improvement plan.
- Phillips sets out his Five-level ROI framework as follows: Reaction and planned action, Learning measurement, Job applications, Business results and ROI monetary value and cost for programme. This model will be used in the verification of ROI for the Rigger Ropesman development.

The Phillips ROI framework and methodology refers to the focus on a results-based process on the HRD programme. Phillips (2005:172) points out that this requires HRD staff to concentrate on measurable objectives when dealing with the ROI process. The qualified Rigger Ropesman adds measurable objective value to the organisation with specific tasks being performed. The common human capital measures are practised, applied, and included into tasks being performed by the qualified Rigger Ropesman.

Innovation and creativity are two of the measurable objectives that can contribute to the Cost Benefit Ratio and to the Financial Return (ROI %) for the organisation. During 1995, the Researcher was appointed as Rigger Ropesman in a sub-vertical shaft at Kloof Gold Mine in Westonaria. One of his major responsibilities was to coordinate, plan and maintain a Double Drum Blair Winder's hoist ropes. The task of "Cutting Back Ends" normally took 16 hours on a

Sunday shift. The labour force included 30 artisan assistants and 6 artisans who were all booked for the 16 hour shift. By applying the innovation and creative ability, the Rigger Ropesman completed the task with his team in twelve hours in that he changed the process in which the work was to be done by the artisans and artisan assistants. The new innovated process became the norm and standard at that shaft. The shorter time spend on the Rigger Ropesman task resulted in productivity increase due to the four hour time saving that took place. Other similar examples include employee attitudes, organisational commitment, workforce stability, employee capability, experience, knowledge, competency levels and employee leadership. Phillips (2005:178) delineates the value added by the artisan and monetary gains to the ROI process.

2.9.3 Calculation of ROI

The amount of money a company gains after the cost of training investment was subtracted as amplified by Coetzee *et al.* (2007:402), will be summarised in the following section.

The following formulas are used to calculate the Cost-benefit analysis and ROI % as indicted by Meyer *et al.* (2007:480, 481):

The artisan average remuneration figures are quoted by an anonymous labour consultant. These figures will be used to create the rationale of the calculations:

Cost Benefit Ratio (CBR) is illustrated with the example of the mine appointing a contractor company to perform Rigging tasks instead of using its own Riggers to perform the same task.

The difference in labour will clearly indicate the cost benefit to the mine.

A contractor Artisan cost to the mine is average R300 per hour.

The contractor will be calculated as Programme Cost since this is an external cost to the mine and the mine does not pay for the contractor's training.

The mine's Rigger's cost is R98 per hour.

The mine's Rigger's cost is calculated as programme benefits since the mine has paid for the Rigger Ropesman's training during his/her learnership.

Cost Benefit Ratio (CBR) = Programme benefits ÷ Programme cost = 300 ÷ 98 = 3.06

Therefore, the CBR for the mine training its own Rigger Ropesman with regard to labour cost is a (3.06:1) Ratio Benefit to the mine on labour cost only as emphasised by Meyer *et al.* (2007:481).

The contractor is viewed as the Programme benefit as he/she was trained externally. The mine must pay for his/her skills and abilities. On the other hand, the mine's Rigger cost has been part of the mine's costing all along.

The ROI% is determined by using the contractor's cost instead of mine Rigger's cost to indicate the percentage return on investment for the mine.

ROI% = Programme benefits/Programme cost x100

$$=300\div98 \times 100 = 306.1\%$$

Therefore, the cost benefit percentage to the mine is much higher than what it would cost to hire external contractors to perform Rigging tasks at the mine. The training cost of the learnership would be the Return on Investment to the mine, which then can be calculated (using the above figures as draft estimates) at an average hourly rate of R200 per hour if a mine Rigger Learner who qualified at the mine is employed instead of an contractor at the high hourly rate of R300 per hour. A monthly (six day work week at 48 hours per week) ROI for the mine will then calculate to R38 400.00 per month (R460 000 per year) saving on one Rigger's cost to company. This indicates an enormous cost saving for the mine to train and develop their own learners. The learnership expenditure could be returned on this saving to the mine within two years as the learnership training programme. These figures are cited from Anglo Platinum Engineering Skills Training Centre as estimated cost. It includes the cost of salaries; the training cost at the training provider which include meals and accommodation; subjects required for the qualification which are obtained from the technical college; with safety clothing and a trade designated toolbox. The cost is estimated at R450 000 for a three calendar year period.

2.10 CONCLUSION

The history of apprenticeships, the background of the artisan history in South Africa and the skills development timeline of apprenticeships, learnerships paved the route for what we know today as the Adult Learning context. The adult learning and education context of the Rigger Ropesman includes development within value systems, ethical standards and spirituality. This context therefore also involves the physical, emotional, intellectual, normative and social powers of the learner as well as his or her artisan development phases. These development phases are represented within the following: The learner or artisan's affective experience, intellectual experience, normative component, perception and communication, gender component, physical component, interaction with other humans, metaphysical component and self-concept of the learner and artisan. Parr (2008:225-227) confirms that the intrinsic and extrinsic motivational

factors as described in the Maslow's hierarchy of needs indeed influence the learner's performance to attain his/her qualification as artisan.

The Rigger Ropesman qualification within the Mining and Minerals Sector and MQA clarifies the existence and validity of the Rigger Ropesman artisan trade in the Mining and Minerals Sector and MQA. The purpose of this qualification is intended for application in the mining industry. Furthermore, it has a primary operational application in the engineering field. Compared with other engineering trades in the Mining and Minerals Sector, the Rigger Ropesman numbers indicate that they form the minority of 3% of all engineering learners. This figure confirms the rationale of this study.

The focus of this literature review was to clarify the processes and literature used to train and develop learners and artisans in the Mining and Minerals Sector. The four routes to become an artisan as laid out by the Scarce and Critical Skills Research Project Commissioned by the Department of Labour South Africa March 2008 were explained in order to set the current perspective of artisan development in the MQA and Mining and Minerals Sector.

The learner's profile experience continuously changes as the learner progresses before, during and after the completion of the learnership. Such continuous changes of learners' profiles are viewed in the different phases of training and development experienced by the learners during their learning intervention. Coetzee *et al.* (2007:402) affirm the learner's psychological fidelity to develop competencies of knowledge, skills and abilities, together with other required characteristics to perform on the job is developed during the early stages of being an artisan.

The return of investment regarding the training and development of the Rigger Ropesman in the Mining and Minerals Sector entails an evaluation process. This is necessary to capture the contribution to ETD in assuring that training indeed adds value to the organisation. The calculations indicate that the ROI for the mine justify the mine to invest in the training and development of Rigger Ropesman artisans. These investments add value to the organisation and the Mining and Minerals Sector.

This chapter aimed to set out the Rigger Ropesman position as an engineering occupation and trade in the Mining and Minerals Industry. The history of apprenticeships and learnerships in South Africa was reviewed to indicate the timeframes and major activities of apprenticeship, and

of learnership and artisan history in South Africa. This review creates a historical background of the artisan history.

Chapter 3 deals with the issues of research methodology and research design. The chapter commences with a preview of Quantitative and Qualitative research methods. The following are clarified: The selection of the research design based on the nature of the research problem; the issue being addressed, the personal experiences of the researcher; and the audience of the study as discussed by Creswell (2009:3). The chapter accentuates the advantages of the qualitative design method and the techniques associated with the method employed in the study. The inter perspective view or ontology of the research process is substantiated by the role of the researcher and the limitations of the study.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

Chapter 2 provided an overview of the Rigger Ropesman's position as an engineering occupation and trade to contextualise the rationale of the problem statement regarding the development amongst engineering artisans in the Mining and Minerals Industry. The chapter concluded with some underlying principles why the Mining and Minerals Industry provides training and development opportunities for the Rigger Ropesman with reference to the ROI aspect in training and development.

The aim of this chapter is to clarify the selection of the specific research design methods and the rationale why this specific research design is used. The chapter begins with a view on both quantitative and qualitative types of designs. From there the selection of the qualitative method for the study is corroborated. The various techniques used during the field work, such as interviews, site selection, document sourcing, and sampling are described in line with the researcher's role. Limitations or conditions of this study and outside the researcher's control as defined by Mertler and Charles (2011:58) are described before concluding the chapter.

3.1.1 Social Scientific Research Design

Social scientific research means researchers apply various scientific methods to transform ideas, questions, hypothesis and phenomena as correlated by Neuman (2011:16). This study will look at various questions and apply scientific methods to attain the primary goal of social science which is to obtain organised knowledge and social reality as concluded by Byner and Stribley (2010:27). The organised knowledge and social reality will be revealed by the research design and methods applied in the study.

3.2 COMPARISON OF QUANTITATIVE and QUALITATIVE RESEARCH DESIGNS

Qualitative and quantitative research designs are discussed in terms of their different designs. Qualitative research can be defined as the researched concerned with the collecting of “*non-numerical data*”, which refers to verbal and written records during interviews and discussions made by participants in the study as confirmed by Christensen et al (2011:29). The qualitative method used in this study confirms the validation of the research design. Fouche (2012:269) in De Vos *et al.* (2010:269) explain that quantitative design provides the researcher with a “*step by step*” method, whereby the design determines the researcher’s choices and actions. On the other hand, the researcher’s choice and actions determine the design or strategy for qualitative research. In this study the researcher had to first determine which design method would suit this research study best.

Leedy and Ormrod (2005:94) discuss quantitative and qualitative approaches and state that “*quantitative research is used to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena. The approach is sometimes called the traditional, experimental, or positivist approach.*”

3.2.1 Test the Hypothesis

The quantitative approach starts with a specific hypothesis to be tested, where after variables are isolated. A specific format or standardised procedure is used to collect numerical data and then a statistical procedure is used to analyse the data in order to draw final conclusions from the data. The approach is therefore based on numerical statistics and the statistical value drawn from the numbers as end result to either prove or reject the hypothesis.

This study does not only focus on statistics in terms of Rigger Ropesman learner development within the Mining and Minerals Sector but poses questions with the following keywords in the research: What, How, When, Which and Why. These are typical questions used in the qualitative research approach.

3.2.2 The nature of the Phenomena

Leedy and Ormrod (2005:94) explain the contrast between the two research methods: Qualitative research is generally used to answer questions about the complex nature of phenomena. The purpose is often to describe and understand the phenomena from the participants' point of view. The approach is often suggested as the interpretative, constructivist or postpositivist approach. On the other hand, quantitative researchers often start with general research questions rather than specific hypotheses. They collect an extensive amount of verbal data from a small number of participants, organise this data into some coherent form, and verbally describe the situation they have studied.

The “*general research questions*” as referred to by Leedy and Ormrod (2005:94) used in this study are the following:

- What are the training and development opportunities for a Rigger Ropesman learner and artisan in the Mining and Minerals Sector?
- To what extent does the training and development of Rigger Ropesman Learners differ from the training and development of other similar engineering trades' learners?
- If such a difference exists, what are the contributing factors?

The rationale of this research is to determine whether the following influence the nature of the training and development of the Rigger Ropesman learner:

- Which contributing factors cause possible variances when comparing the learners' training and development to other similar engineering trades in the Mining and Minerals Sector?
- Are the training and development provided for the Rigger Ropesman learner of same quality as the training and development provided to other similar engineering trades?
- Does the earning potential of other trades have a bearing on the selection of the Rigger Ropesman?

The above questions in the qualitative study will guide the reader into tentative answers that could lead to a hypothesis, as affirmed by Leedy and Ormrod (2005:94).

3.2.3 The Characteristics of Quantitative and Qualitative research approaches

The characteristics of the quantitative and qualitative approach and how it applies to this study are discussed below:

The study is a case study with an interpretive approach in the sense that the answers on the interview questions will be interpreted within the specific case. The quantitative approach can include characteristics such as experimental variables, hard data or statistical data.

Key concepts of quantitative characteristics in this study include variables, controlled circumstances and evidence, whereas key concepts of qualitative characteristics used in this research include understanding the meaning, context and participant's perspective. The academic association in qualitative characteristics asks questions concerning an interest in anthropology as described by Lichtman (2013:321) as the systematic study of groups of people (in this case artisans or human beings' experiences and the history of their learnership and artisan development). The quantitative academic affiliation could include the psychology or basic science as key concept.

The goal orientated characteristics in the qualitative method develop understanding, describe multiple realities, and discover training and development opportunities for the Rigger Ropesman in the Mining and Minerals Sector. These characteristics also describe factors that influence the training and development of Rigger Ropesman as different from other similar engineering trades. The quantitative goal could be to test the theory, make predictions or to statistically describe the research goal.

The next characteristic as mentioned by McMillan (2012:11,12) is the design characteristic. This includes the flexible and holistic approach of the interactive research design, using a collaborative partnership with the participants with the purpose of collecting data. The quantitative different characteristic may include a structured, predetermined and specific research design, which would not include tolerances as described in the qualitative characteristic.

The sample characteristic indicates a clear contrast between the two research methods: The quantitative method uses large groups, which are randomly selected. The contrast of the qualitative method is visible when small sample groups are selected. These are elected purposefully with specific grounds for the selection. In this study the sample group consists of

six participants and only one focus group. All of the selected participants are involved or qualified in the Rigger Ropesman artisan trade.

The data characteristic differs as stated by McMillan (2012:11,12). The quantitative method may use measures/instruments, numbers and statistics; while the qualitative method in this study uses verbal descriptions, narratives and sequential events in the training and development paradigm of the Rigger Ropesman.

The data collection technique or method characteristic in quantitative research could be one or few sources, experiments, structured interviews and surveys. The qualitative research for this study made use of multiple sources of participants over the complete spectrum of the Rigger Ropesman trade, utilising open-ended questions in an interview format with direct data collection techniques.

The role of the researcher differentiation is vast seeing that the quantitative researcher's role is distant, short-term, detached and uninvolved. The results are based on mutual trust and evolve or develop a scope of communication opportunities for the future. During the interviews the researcher received several invitations to contact the participants whenever more information was required.

The last characteristic revealed by McMillan (2012: 11, 12) is called data analysis, which could be either deductive or statistical in quantitative research. This study portrayed the data analysis in the qualitative characteristic as interpretive of what the participant said. Inductive pattern reasoning is evident in the manner which they responded to certain questions. The inductive conclusions may have been influenced by similar case studies.

The above characteristics indicate the different options available in quantitative and qualitative research design methods. A third method, namely the Mixed Method Research is another option available to the researcher. Creswell (2009:138) explains that this method consists of a combination of the quantitative and qualitative method and does not rely on either of the two methods alone. The combination of the two methods provides the best literature for both the research questions and hypothesis. Creswell (2009:138) also describes a strong mixed method as a study that begins "*with a mixed method research question to shape the methods and overall design of the study.*"

The researcher can clearly distinguish the research method that will address and breakdown the study proposal in hand. The qualitative design methodology will be looked at in the next paragraph with more detail as the research method selected for this study.

3.3 QUALITATIVE DESIGN AND METHODOLOGY

According to Ragin (1994:91) as quoted by Flick, (2006:135), the definition of research design is as follows: *"Research design is a plan for collecting and analysing evidence that will make it possible for the investigator to answer whatever questions he or she has posed. The design of an investigation touches almost all aspects of the research, from the minute details of data collection to the selection of the technique of data analysis."* The questions posed in this study can only be answered when the evidence is collected and analysed as the participants in the study are key role players in the research design.

The aim of qualitative research study is to *"understand the phenomenon or topic in the study from the interior"* as stated by Flick (2006:76). It is an analysis of the subject which one attempts to understand. In this study the subject is the Rigger Ropesman's training and development opportunities in Anglo Platinum and the Mining and Minerals Sector. The analysis of this training and development process must be clear in order to understand the relationship between the Rigger Ropesman and other similar engineering trades within the Mining and Minerals Sector.

In qualitative research the researcher wants to discover not only what happened but also how, why and when it happened. The reason for this is that qualitative studies strive to aim for depth instead of *"quantity of understanding"* according to Henning *et al.* (2007:3). The method includes the researcher's attention to focus on how the participants represent their feelings and thoughts during the verbal interview processes. This will provide a better understanding of the participants' world and how they perceive the actual research phenomenon (Henning *et al.* 2007:3). The researcher's approach in this study cultivates an open ended interview circumstance and environment. This will enable participants to present their views, as to facilitate the characteristics of the phenomenon, which would lead to the result of the better understanding thereof Henning *et al.* (2007:5).

Lichtman (2013:70) states that in qualitative research it is possible to start with a topic, with participants or with a specific approach. Yet it is more significant to start with a research question. The above statement is supported by De Vos *et al.* (2010:321) who states that when the research question is conceived the researcher should decide on the nature and extent of the study. Therefore, this was also the onset of this research study.

The researcher became aware of various training and development opportunities for other similar engineering trades such as Electrician, Fitter, Diesel Mechanic, MC & I, and Plater Boilermaker. The research question inevitably arose: What are the possible training and development opportunities for the Rigger Ropesman in the Mining and Minerals Sector? This question is connected to the research approach and topic and it is also connected to the participants selected for this research study. These questions refer to interrelated factors in the qualitative research study (Lichtman, 2013:71). In this study the question directly relates to participants involved in the Rigger Ropesman development either personally or as HRD Officers.

The connection with the research topics (as interrelated factors) during the development of the Rigger Ropesman might influence the Rigger Ropesman's training and development negatively. These factors include possible training opportunity differences, training quality differences and earning potential of other trades.

3.3.1 Reliability

This qualitative research study applied the assessment criteria of **Reliability** to assess the qualitative research performed with data collection methods such as verbatim interviews and dependability of data as stated by Flick (2006:371). **Interrater Reliability** is a measurement criteria used where two or more individuals or researchers evaluate the same product and give the same result where the characteristic or interview questions remain unchanged. For example, in this study, the same questions were used with all participants. Using the consistent standardised instrument from one situation to the next (one interview to the next) improves the reliability of the instrument (Leedy & Ormrod, 2005:93).

3.3.2 Validity

The **Validity** of qualitative research has been argued by Denzin (1989) and quoted by Bloor. Wood (2006:148) reflects the need for improved research understanding instead of a focus on accuracy. This study's main aim is therefore to create a clear understanding of the training and development opportunities of the Rigger Ropesman in the Mining and Minerals Sector. Another approach in analysing the interview situation is to assure a degree of authenticity in order to bring justice to issues in the study, as described by Flick (2006:373). The data's validity deals with the research intention, in other words the credibility of the data, which in turn is supported by the credibility of the participants in the research, as confirmed by Mertler and Charles (2009:199). The interviews were conducted while being audio recorded by the researcher and transcribed by private person to be available as evidence in order to ensure credibility and validity.

3.3.3 Triangulation

Individual and focus group interviews used to gather data represent more than one data source. The credibility of the methods used in this research study is enhanced by employing techniques of using more than one data source while focusing on a single point. This technique is known as **Triangulation**, as referred to by Glanz (2006: xiv) in quoting from Marshall & Rossman (199:146).

3.3.4 Trustworthiness

Baily (2007:181) summarise the concept of Trustworthiness in stating that trustworthiness contains a set of evaluative criteria, closely related and interdependent: credibility, transferability, dependability and conformability. These criteria require time and experience to develop, the participants and the researcher of this study were involved in long periods of time during the training provided at ESTC. Trustworthiness between trainer and trainee developed during these training periods as trusting relationships have been built between the researcher and the participants in the study as confirmed by Marshall and Rossman (2006:62).

The other leg in trustworthiness is the trust relationship between the researcher and the participants in the study. Gaining trust is very important to the success of the interviews; once

trust is gained it can still be very delicate if not managed in a worthy and respected manner as supported by Denzin and Lincoln (2008:132). The participants in this study did all their training with the researcher and were familiar with his personality and character which contributed to the gathering of good qualitative truthful data from the participants as explained by Marshall and Rossman (2006:73). The next section will highlight the advantages of the qualitative design as applied in this study.

3.4 ADVANTAGES AND DISADVANTAGES OF QUALITATIVE RESEARCH METHOD

The advantages of using the qualitative approach are highlighted in this section. Research designs are research plans and procedures that consist of decisions from broad hypotheses or phenomenon to specified methods of data collection and analysis as confirmed by Creswell (1998:3).

3.4.1 Advantages of a Qualitative Research Method

Typical approaches or strategies for data collecting in the qualitative design include: Narrative research, Phenomenology, Ethnographies, Grounded theory studies and case studies. (Creswell, 1998:12). The approach used in this study is a case study approach. Willis (2008: 211) in Yin (2002:1) state that case studies are *“the preferred strategy when “how” or “why” questions are being posed and when the focus is on a current phenomenon within real-life context. Such explanatory case studies can be complimented by exploratory and descriptive case studies.”* This research includes the specific and detailed study of a case. The case study revolves around a particular training and development programme, which is critical to the design, analysis and interpretation of the study as explained by Lichtman (2013:92).

In this case study the advances of the study engage in-depth investigations of a specific group as stated by Glanz (2006:174) which is the engineering trades in the Mining and Minerals Sector. The Intrinsic case study is exclusively concentrated on the aim of gaining a better understanding of the training and development opportunities for the Rigger Ropesman in the Mining and Minerals Sector (De Vos *et al.* 2010:272). Further advantages of the case study include that it is written by the researcher in an explanatory and objective style. The study

findings are presented in-depth in verbal layout, instead of numeric statistics as mentioned by Glanz (2006:174).

Additional qualitative research advantages are the flexible design and the emphasis on the participant's natural settings in the normal work environment. This is in line with the goal to develop understanding of the practice taken place in the normal working life of the participant. Multiple data sources, such as individual interviews, the focus group and review of documents were used to execute the study as affirmed by McMillan (2012:12, 13). The research design contains a great deal of rich description of the phenomenon being studied. Moreover it is concerned with the entire process and the product since it involves people and events within their personal lives and career environment as confirmed by Mertler & Charles (2011:227).

3.4.2 Disadvantages of a Qualitative Research Method

Marshall and Rossman (2006:134) emphasised the weaknesses or disadvantages by referring to the following aspects:

- The individual interviews and focus group interviews could cause misinterpretations by the researcher of the study due to misinterpretations. During this study the researcher assured his understanding of the reply by the participants are interpreted correctly by confirming and repeating the answer received from the participant.
- The individual interviews could be readily exposed to ethical dilemmas. The ethical criteria and standards applied during the study ensured the elimination of the ethical dilemma scenario.
- The individual interviews are too dependent on the participant's openness and honesty. The researcher of the study assured the trustworthiness relationship with the participants will host open and honest response from the participants.
- The focus group interviews are dependent on the "goodness" of the initial research question. The interview questions related to the initial research question but also enquired about the other research questions raised in the study. The full spectrum of the study was addressed in all the research questions.
- The individual interviews and the focus group interviews are dependent on the researcher's interpersonal skills. The interpersonal skills of the researcher surely influence the quality of the responses from the participants; this does not mean it is a

disadvantage or weakness but rather a strength factor to assure the required information are collected for a resourceful research study.

The following section emphasises the Face-to-Face interview technique as another advantage of qualitative research.

3.4.3 Interactive Design: Face to Face Interview Technique

The face-to-face interview technique can be classified within the definition of qualitative interviews. Greef (2010:287) quotes Kvale (1996) stating this interview technique as “*attempts to understand the world from the participant’s point of view, to unfold the meaning of people’s experiences, and to uncover their lived world prior to scientific explanations*”. This definition articulates the value of the research study as it confirms the uncovering of the experience of the participant or interviewee during the training and development interventions as learner and artisan. According to Greef (2010:287) interviewing is the predominant technique of information collection, especially when it is done in person with the participant. This technique was applied in the interview sessions by the researcher. The transcribing in typing format of the interviews was conducted by private persons at cost of the researcher.

3.4.4 Semi Structured Individual Interviews

In this study **semi structured individual interviews** and focus group interviews were conducted with participants. Permission and authorisation to use Anglo Platinum employees as participants in the study was obtained from the Head of Training and Development in the company during an Individual Performance Assessment interview attended by the researcher.

The interviews consisted of six individual interviews that included one Rigger Ropesman HRD Officer; one HRD Engineering Learner Supervisor; one Plan Maintenance Officer; two Engineering Foremen; and one Rigger Ropesman artisan. With the exception of the HRD Engineering Learner Supervisor, all the other five participants started their careers as Rigger Ropesman Learners. They qualified in the ESTC where the researcher was the HRD Officer who trained and trade tested them to qualify as Rigger Ropesman artisans during the period 1997 to 2010.

The researcher compiled a semi-structured interview guide which includes questions that were asked to analyse the data obtained from the participants. Baily (2007:100) emphasised the fact that semi-structured interviews allows the researcher to enjoy some level of flexibility on how the interview is administered and to control the parameters of the flow of the interview. The interview questions aim to uncover the opinions, feelings and experiences of the participants (Reeves, 2003:71-72). Open-ended questions were clearly drafted in simple language to obtain easy understanding and effortless responses from the participants (Mertler and Charles, 2011:196).

The semi-structured questions or questions without the predetermined answer choices allowed the participant to respond to the questions with individual responses. The objective questions used in the interview allowed for penetration, follow-up and explanation during the interview as explained by McMillan (2012:168). The interviews were scheduled on separate dates, times and venues by the researcher to accommodate the participants and to assure multiple uses of data collection. The venues included offices and lecture rooms at ESTC for various participants while other interviews were conducted in offices on the mine where other participants are employed. The venues were pre-booked and reserved for the meetings and not disturbed during any of the interviews. The participants were greeted, welcomed and set at ease ensuring the comfort of the participants before the interviews were started. This provided a more inclusive awareness of the research question as observed by the participants. The view and responses of the participants are addressed in Chapter 4 of this study where the different information sources are examined and used to construct a coherent justification to establish themes to be explained in data analysis and interpretation (Creswell, 2009:191).

The interviews were conducted on the following dates: The Focus group interviews with six Rigger Ropesman learners were conducted on 25 October 2012 and the HRD Engineering Learner Supervisor interviews also took place on 25 October 2012. The interviews of the Plan Maintenance Officer and the Rigger Ropesman were conducted on 31 October 2012 and the Rigger Ropesman HRD Officer and the female Engineering Foreman interviews were conducted on 02 November 2012. Finally, the male Engineering Foreman interview took place on 13 November 2012. Interviews were conducted at various time slots to suit the researcher and the participants.

The interview framework and ethical aspects were explained to the participant and consisted of the following:

1. Title of the project
2. Institution

3. Details of researcher and research supervisor
4. Project aim
5. Participants expectations
6. Precautions taken to protect the participant
7. The manner of making the project findings available
8. Informed consent signing (as voluntary participants in the interview and research project)
9. Starting with the 13 interview questions framework.

The semi structured open ended questions used for the individual interviews were also used during the focus group interviews. The qualitative role of the researcher created a close identified link with the participants due to his involvement in the specific artisan trade. The results were mutual trust and the development of a scope of communication opportunities for the future. During the interviews the researcher received several invitations to contact the participants if more information was needed. Collaborative partnerships with the participants were essential to collect information with the main aim of creating understanding of how and what was to be done during the particular processes. The researcher has 24 years' personal experience as Qualified Rigger Ropesman, Rigger Foreman and Rigger HRD Officer. Currently, he is a HRD Coordinator. This experience was to guarantee the correct perspective and spectrum of data collection; as substantiated by McMillan (2012:296): "*the strength of an interview is allowing the researcher to control the conversation and obtain information needed*". As observer, the researcher attentively observed the participants' actions and reactions during the interviews and remained unbiased with an objective approach confirming the answers of the participants.

All interviews were audio recorded with the recording device placed visible on a table to all parties and verbatim typed at a later stage in the study. All data were organised, and prepared for content analysis as referred to in Chapter 4. The next section clarifies the method used to do the sampling of the focus group in the interview.

3.4.5 Focus Group Interview

A **focus group** was also interviewed. This group consisted of six participants who were still being trained as Rigger Ropesman learners. Willis (2008:207) explains the focus group method in which the researcher randomly selects a group of 20 participants, by using the unequal numbers of a list of earners within the sample group. The first 6 unequal numbers (1, 3, 5, 7, 9,

and 11) from the list of 20 were selected to participate in the study. The semi structured open ended questions that were used for the individual interviews were also used for the focus group interview. This technique confirms the various sources of data gathered for the data validity and triangulation technique. As a result, the quality of the data collected is ensured.

The focus group method differs from the Delphi Technique which utilises the involvement of a group of professional practitioners. The methods used to gather information from these expertise participants can include questions being sent via media such as e-mails and online surveys. Following the interview, the responses are returned to the moderator, who then responds on additional rounds with further questions until consensus amongst the experts is reached. A report is then created which is basically the summary and results agreed (Willis 2008:208). In this study the Delphi technique could not be used since the research aim was completely incompatible to the professional expert approach, which applies to the Delphi technique. The following section will discuss the selection of the research site.

3.4.6 Site or Social Network Collection

Maree & van der Westhuizen (2009:22) describe research sites as “*places where research will be conducted*”. In this research study, the most appropriate *research site* where the individual and focus group interviews were conducted was the Engineering Skills Training Centre in Randfontein. This *research site* is the venue where individual interview participants attend courses and where the focus group were trained during the time frame when the interviews were conducted. The HRD Engineering Learner Supervisor attended a meeting at the venue when his interview was conducted. The ESTC venue as *research site* has also been the researcher’s work environment for the last 16 years.

The abovementioned background sets the stage for booking venues at the *research site* that would ensure privacy. The aim was that the intervention had to proceed without disturbance of any kind during the different interview time slots. The confirmation of the comfort of the participant formed part of setting the stage for the interview to ensure the individual’s full cooperation during the interview (Reeves, 2003:72).

Due to the availability of the participants and the researcher, it was obvious that the interviews would be conducted over a period of time. Creswell (2008:178) quotes Miles and Huberman

(1994) when describing the scenario as follows: the *setting* (where the research will take place), the *actors* (those to be interviewed), the *events* (what the actors or interviewed will observe or do), and the *process* (the evolving nature of events undertaken by the actors within the setting). The *setting, actors, events and process* occurred as scheduled at the ESTC without any distractions. This occasion will be explained and analysed in the next chapter. The interviews for Rigger Ropesman artisans and the Plan Maintenance Officer interviews were the only two interviews that had to be conducted at their own worksites. Due to work environment circumstances these participants were prevented from travelling to the ESTC. These particular interviews were scheduled in private offices and took place without any disturbance or discomfort. The total number of interviews conducted were 12.

Authorisation to use the ESTC facilities for the above data collection methods was obtained from the HRD Manager of ESTC. The stage preparations for the interventions of all interviews were approved by the ESTC management. The following section clarifies the gathering of document sourcing.

3.5 DOCUMENT SOURCING

The gathering of data in the format of reports, articles, statistics, annual reports, expert opinions, legislation, internet websites were done by the researcher either from his office at the ESTC or from his office at home. Although these documents were not compiled for research study purposes the information can be used for research references to confirm or disapprove arguments in research studies alike (Flick, 2006:245-253).

Documents are classified as two types namely primary sources and secondary sources. Primary sources refer to documents that provide first information and are written in the first person. For this reason, the author had direct experience with the event. Secondary sources refer to second-hand documents, such as descriptions of an event, or a summary of primary information (McMillan, 2012:295).

In this study the researcher was the co-author of the Portfolio of Evidence (POE) document and of the drafting of the Rigger Ropesman qualification at the MQA. These sources are referred to in Chapter two as primary source documents. An example of a secondary source used in this study is typical examples of Merseta's "Impact Assessment of Learnership and Apprenticeship

Study”, which reflects the history of apprenticeships and learnerships. McMillan (2012:295) also illuminates “*Artefacts as archival sources that are different from documents*”. Examples of “*artefacts*” used in this study are the HRD Strategy for South Africa; the MQA SSP in Chapter 1; the MQA Data System and Learnership Report; and the ESTC Learnership Midyear report.

Meyer (2004:28) defines research as: “*the process of using scientific methods to confirm existing knowledge, or to expand current knowledge or to create new knowledge*”. Gamble’s research confirms this statement as follows: “*Any form of research, whether qualitative or quantitative aims to produce valid and relevant knowledge*” (Gamble, 2004: 41). In this research study the “*knowledge*” component represent primary and secondary source documents and artefacts used to expand and create new knowledge in the research topic. Document sourcing was one of the methods used to gather data although interviews (as dealt with in the next section) comprise the largest source of information gathering in this study.

3.6 SAMPLING

According to Robson (2002:260), sampling is an essential aspect in life as we make conclusions, assumptions and judgements about people, places and things on the grounds of our own perspectives and facts. Sampling filters through in all features of research studies and emerges in different formats (regardless of the research method or study applied). In this study the labelled sample group interview was vital in the qualitative data collection method, as it depended on the systematic questioning in a formal semi-structured interview as supported by Denzin and Lincoln (2007:126). The term “*sampling*” indicates the plan and aim to “*represent*” a specific group of people with common understanding and criteria to answer questions related to the specific research question. Maxwell (2004:88) calls this “*purposeful selection*”. During this study it was essential to represent the Rigger Ropesman trade in the Mining and Minerals Sector. Anglo Platinum was also represented specifically to focus on the training and development opportunities and the research questions linked to it. Therefore, the **simple random sample** selection on a small scale provided all participants with an equal chance to be selected for the interview process as summarised by Dawson (2007:51).

Creswell (2009:148) concludes the sample process as follows:

- The identification of the sample group was representatives of the Rigger Ropesman trade at Anglo Platinum within the Mining and Minerals Sector.
- The size of the sample was determined by the researcher's preference and by using a "Learners Profile" list of Rigger Ropesman learners presented at ESTC during the time-frame when the interviews were conducted.
- A single stage sampling process, where the researcher has access to the names of the Rigger Ropesman Learners on the applicable "Learners Profile" list, was used to do the sampling.
- The selection process for the participants involved "*stratification*" of the Rigger Ropesman. In other words, the sample participants represented the true population of the group where 15 males and 5 females were included in the group.
- The "Learners Profile" list consisted of a numbered list of learners from 1-20. The participants in the interviews were randomly selected by using the equal numbers in the list.
- The number of people determined to be interviewed on a small scale were six participants. The first six equal numbers out of the list of 20 would be the following numbers: 2, 4, 6, 8, 10 and 12 as listed in Table 4.1. These learners were notified to participate in the interview as scheduled by the researcher on 25 October 2012 at 10:00 at the specified venue reserved by the researcher for this random sample focus group interview.

A focus group interaction causes individual participants to become involved and committed into the enduring conundrum, which leads to greater advantages and results from the data gathering method (King and Horrocks, 2010:70). Focus groups provide fascinating insights and advantages. This is due to the open conversation and development of understanding within these groups, and the wider spectrum of cultural ideologies, which lead to advantages that are absent during individual interviews as stated by Kritzinger (1994:116). Some of these advantages were also experienced during this sample group interview. The specified attention to the topic under discussion led participants to explore different ideas. This ensured that the data gained from the topic was interconnected as confirmed by Kritzinger (1994:116) mentioned another factor of focus group interviews such as the responses and statements influenced participants to change their minds on how facts and stories actually operated in the training and development scenarios within their learnership process e.g. detail regarding the "*career choice*

to select the Rigger Ropesman learnership” lead to different perceptions and answers received from participants. The following section uncovers the role of the researcher in this study.

3.7 RESEARCHER’S ROLE

During the course of the research study, a researcher will occupy several challenging functions and responsibilities (student, employee, marital and family responsibilities). Furthermore, church, sport and leisure activities may all contribute to “*role-strain*” as expressed by Roberts (2007:31). Creating a collaborative partnership with participants is essential to collect and analyse data with the main aim of creating understanding of how and what to do during the research processes. The researcher’s personal experience will be used to guarantee the correct perspective and spectrum of data collection. As mentioned before, the researcher will observe the participants’ actions and reactions during the interviews and remain unbiased.

The following functions form part of the researcher’s role:

- Preparing individual and focus group interviews;
- Preparing interview records and schedules;
- Conducting interviews;
- Observing participants during the interviews,
- Ensuring the transcribing of the interviews by a private person and
- Analysing documents, policies, directives, procedures, work skills plans and annual reports.

This study will be completed within the ambit of the principles as set out in the Ethical Code of Practice number NWU-0097-11-S2 of the North West University. Ethical moral commitment includes adhering to the following:

- Professional competence
- Professional relations
- Privacy, and
- Confidentiality, records, research and publication.
-

In this study, the researcher aimed to treat participants with dignity and to reduce their anxiety or discomfort. The researcher also obtained the necessary written informed consent from each participant as per attached Addendum C.

In line with Neuman (2000:283), the researcher also ensured the confidentiality of data. The researcher was open and frank on the purpose of this study and abstained from any form of dishonesty during the research period. According to Meyer and Botha (2004:310), the discipline of ethics in general context refers to what is right and what is wrong when dealing with other people and how we make decisions. In this regard, a detailed prescribed application form was submitted for approval by the NWU Office for Research Support – Ethics Committee.

The researcher acted as Project Head applied and declared the following prescribed ethical considerations as set by the NWU Office for Research Support (Ethics Committee). The researcher confirmed that the information in the application was, to the best of his knowledge correct and that no ethical codes were violated during the study.

- The researcher ensured that the project was managed ethically justifiably from beginning to end.
- The researcher explained to all participants the principle that their participation in the research study was voluntary, and that no pressure was placed on any participant to participate.
- The researcher clearly stated to all participants that any participant may withdraw from the project at any time. Any participant may have asked that his or her data no longer be used in the study, without stating any reasons for such withdrawal, and without fear of any form of discrimination.
- The researcher issued an informed consent form to each participant and ensured that every participant fully understood the information process.
- The informed consent forms were signed in writing before the study commenced.

The researcher ensured that any foreseeable risk was restricted to the minimum, any permanent damage was avoided and that all appropriate precautions and safety measures were in place at the different venues where the interviews were to be held.

The researcher ensured that all participants' information was respected and safeguarded.

- The quotations used in the data analysis were indicated with an “**I – Interviewee**” and the participants were kept anonymous throughout the study.
- The researcher committed himself to report any problems and complications to the Ethics Committee.

- The researcher undertook to respect intellectual property and to avoid any form of plagiarism.

Flick (2008:138, 139) highlighted, the researcher eventually also undertook the role of writer in clarifying the research process utilising the standards, procedures, strategies, methods and techniques to the readers of the research study. The above roles, research and increased understanding of the educational process all contribute to the impact of teaching and learning that ultimately leads to improve educational practice as concluded by Wiersma and Jurs (2009:1). The next section focuses on the limitations of the study.

3.8 LIMITATIONS OF AVAILABLE LITERATURE RELATED TO THE STUDY

Research reviews are a reproducible method to identify work performed by researchers, students and practitioners on programmes or previous studies (Fink, 2007:348). One of the major limitations of this study was the lack of literature related to the study topic. Robson (2002:509) identifies two factors that influence literature's relevance, which are:

- (1) Those factors already identified on the subject; and
- (2) The study's relationship to earlier studies.

The concept of referring to or conducting dialogue with other similar studies in the same field could not be justified as the researcher could not find other studies in the same field. This limitation obliged the researcher to form links to related subjects which supported the flow of the research process and study. Wisker (2008:169) accentuates the term "*theoretical perspectives*" in stating: "*there are debates and areas of work to which your own work can contribute rather than reviewing a dead set of theories.*" The dynamics of contributing to or starting new work promotes the synthesis of new ideas, new debates and different theories as the work contributes to new knowledge as confirmed by Wisker (2008:169-171). The research study on training development opportunities for the Rigger Ropesman in South Africa aims to clarify the relevance of this trade for artisans in Mining and Minerals Sector, since it is not such a well-known and familiar trade as other similar trades in South Africa, such as Electricians, Fitters, Plater Boilermakers and Diesel Mechanics.

Research by Anfara and Mertz (2006:195) stated qualitative enquiry as follows: “*qualitative forms of enquiry demand that theory be used with imagination and flexibility*”. The concept of “*imagination and flexibility*” confirms the complication of qualitative research study and the integration of the literature theory applied to the study. The reality of the limited available literature pertaining to this study encouraged the researcher to contribute new understanding by using flexible questions and arguments.

In agreement with Mertler and Charles (2011:58), one should consider restrictions or conditions beyond the researcher’s control such as non-user friendly issues regarding a case study. “*The single case study cannot easily generalise from one case*” (Wisker, 2008:216). The case study perspective must be clearly stated in order to confirm validity and effectiveness in other similar case studies. The case study of the Rigger Ropesman’s development in the Mining and Minerals Industry could for example be used for other non-prominent trades in the Mining and Minerals Industry, such as Carpenters and Plumbers. The usefulness of the case study cannot be stated in generic context, but is a good example of particular practices in a mine’s operation when viewing specific issues of practise on that mine as referred to by Wisker (2008:217).

3.9 CONCLUSIONS

The aim of this chapter was to clarify the selection of the specific research design as qualitative research design. The chapter started with a short discussion of both the quantitative and qualitative types of research design and then verified it by highlighting various advantages and disadvantages of the designs. The rationale for using qualitative research design was expressed. The various techniques used during the field work such as interviews where the interviews were scheduled on separate dates, times and venues by the researcher to accommodate the participants were done to assure multiple uses of data collection, site selection, document sourcing, and sampling were described in terms of the researcher’s role. The researcher’s role was clarified including the functions and ethical commitments made by the researcher. Limitations or conditions beyond the researcher’s control were described before the chapter was concluded.

The next chapter presents the analysis and interpretation of data and discusses the methods and techniques applied in the process. The validation, reliability and data triangulation are dealt with and followed by conclusions on the data.

CHAPTER 4

ANALYSIS AND INTERPRETATION OF DATA

4.1 INTRODUCTION

The previous chapter illuminated the research design and methodology employed in this study. The chapter clarified the selection of the research design based on the nature of the research problem. The chapter emphasised the advantages of the qualitative design method and techniques associated with the method employed in the study. Due to the researcher of this study's involvement in the specific artisan trade the qualitative role of the researcher created a close identified link with the individual and focus group interview participants. The major limitations of the study and the circumstances beyond the researcher's control were highlighted, including the response of the researcher to these situations.

This chapter analyses and interprets the data gathered in the previous chapter as explained by Creswell (2009:175). The chapter is endorsed by the following: the process of collecting raw data; data organisation and preparation for content analysis; data coding; clarification of themes and research questions; and interpreting the meanings of themes and descriptions.

Quality reinforcement is confirmed by the validation, and reliability and data triangulation before the chapter is concluded.

4.2 RAW DATA COLLECTION: INTERVIEWS AND ARCHIVAL SOURCES

Qualitative data are significant in that it illustrates diversity. Although statistics is not integrated, the diversity of human communication in this study is a major role-player in gathering raw data (Gibbs 2009:2). The collection of raw data were done by means of archival sources such as annual reports, legislation, and internet websites. The physical interaction with participants included conducting individual and focus group interviews.

The interviews were audio recorded and the following advantages of using this method to collect raw can be listed (Dawson 2007:69):

- The researcher did not have to make notes while talking and listening to the participants simultaneously.

- The researcher could concentrate on listening to the participants' responses and be part of their communication process during the interviews.
- The researcher could maintain eye contact with the participants, ensuring them of his undivided focus and attention while they were talking.
- When all the interviews were completed the entire records of the interviews were available to be verbatim transcribed for data analysis purposes.
- The audio recording method enabled the researcher to perform pilot runs with the equipment beforehand, to ensure that the equipment and circumstances would produce the quality desired for the data collection method applied.
- The advantage of the audio recording method to collect raw data ensured that ample of valuable quotations were available for the completion of the research report.

During the collection of raw data individual and focus group interviews were conducted. These interviews involved formulating questions and posing them to the participants as open ended questions in order to elicit data from the participants (Willis, 2008:244, 245). The focus was on comforting participants to respond to the questions with ease (Willis, 2008:246). The following guidelines were followed to ensure that all the questions asked were clear and understandable.

- The introduction to the interviews was a short description regarding the study.
- The researcher attempted not to deviate from the questions and the way it was ordered.
- Before the focus group interview session the participants were requested not to interrupt or respond on behalf of other participants in the focus group.
- The personal view and perceptions of the researcher were not discussed or expressed during the interviews.
- The responses of the participants were sometimes repeated to the participants, to ensure that their version of the response was stated correctly and exactly understood as per following quoted example:
 - Would you say the training and development provided for the Rigger Ropesman are of the same quality as provided to the other engineering trades in the learnership programme?
 - I: Yes.
 - R: Same?
 - I: Yes, it is the same.

- R: Thank you very much.
- Changes in wording were not made in the participants' responses as noted by Willis (2008:246).

The above guidelines created a fluent structure and ensured the clarity of questions and responses during the individual and focus group as confirmed by Creswell (2008:178). As far as available, archival data sources such as reports, articles, statistics, annual reports, expert opinions, legislation, and internet websites were collected during the process of the study at different time frames. The researcher had to be selective regarding the context of data material to ensure that it supported the aims and outcomes of the research study (Wisker, 2008:217).

4.3 DEMOGRAPHICAL INFORMATION OF PARTICIPANTS

The participants were requested to provide certain demographical information. This information is included here to clarify the spectrum of the Rigger Ropesman's trade aspects regarding racial and gender factors, and to represent the interviewed group's relevant Mining and Minerals Industry experience. These results are only briefly reported on in this section, as they do not have an impact on the achieving the research objectives.

Participant	Interview	Gender	Position	Mine Experience
Participant No:1	Individual	Male	HRD Supervisor	33 years
Participant No.2	Individual	Male	Engineering Foreman	7 years
Participant No.3	Individual	Female	Engineering Foreman	12 years
Participant No.4	Individual	Female	Foreman/Planner	12 years
Participant No.5	Individual	Male	Artisan	17 years
Participant No. 6	Individual	Male	HRD Officer	20 years
Participant No.7	Focus Group	Male	Learner	5 years
Participant No.8	Focus Group	Male	Learner	5 years
Participant No.9	Focus Group	Male	Learner	6 years
Participant No.10	Focus Group	Female	Learner	2 years

Participant No.11	Focus Group	Female	Learner	2 years
Participant No.12	Focus Group	Female	Learner	1 year

Table 4.1 Demographical Information of Participants

The selection of the above interview participants reflects valid information as confirmed in this paragraph. Gillham (2009:7) refers to Deutscher (1966: 54-235) regarding the issue that people express their attitudes and feelings verbally, regardless of whether these attitudes are acceptable or unacceptable; good or bad. The attitudes are expressed in the manner in which people talk about themselves and their experiences. This behaviour is typical expressions identified in the qualitative research scenario. During the interview sessions the participants were given the opportunity to express themselves in this manner to obtain realistic information from their experiences. The validity of using different kinds of methods, for example the use of both individual and focus group interviews, validates the evidence as explained by Gillham (2009:7) by referring to Gillham (2000b:4-91) and (Brewer and Hunter (1989). The above participant demographical information confirms the variance of persons involved in the real-world of work of the Rigger Ropesman trade in the Mining and Minerals Industry. This contributes to the validity of the research study.

4.4 ORGANISE AND PREPARE DATA FOR CONTENT ANALYSIS

The interview data collection method was used with the aim of focusing on what the participants thought, felt and did as well as what they had to say about their experience of the topic. The semi structured interview guided by interview questions provided the researcher with the participants' subjective reality, which was to be integrated into the research report (Henning *et al.* (2007:52). The researcher organised and prepared the raw interview data for content analysis. The interviews were audio recorded and saved on a computer file allocated for this study. It was also stored on a USB mass storage device (memory stick).

The process of converting the recorded interviews into text is called "Transcription" as confirmed by King and Horrocks (2010:142). The purpose of transcription is to type the data into text format so as to prepare for the data content analysis. The transcription produces a valid typed record of the interview data that was collected (Gillham, 2009:120). Data preparation in transcription format includes time and effort either by the researcher or another person to type (obviously at a cost incurred). The time consumed during the transcription

interpretive process is more or less four to six times longer than the time spent to gather data (Flick, 2009:10).

The management of the transcribed data is a sensible task, which includes the safekeeping of the data. De Vos *et al.* (2010:337) quoted Patton (2002:441) recommend that a master copy be kept of the transcribed data in a safe place. The researcher therefore kept copies on different computers of he only has the passwords and hard copies to ensure that the transcribed data would be available when needed in his office and personal study room at home. The interviews were transcribed word for word, and included additional non-linguistic utterances such as laughter, sighs and contextual features such as “Hmm”. This ensured that the verbatim typed data strengthened the quality of the qualitative data collection method (King and Horrocks, 2010:143-148).

Gibbs (2009:11) maintains that the reasons for transcription are evident although other researchers claim to analyse directly from their recording appliances. Transcription allows one to focus and concentrate while reading the interviews, which also simplifies the analysis and decision-making in terms of themes, categories and sub categories. According to Gibbs (2009:11), “transcription is a *“change of medium that introduces issues of accuracy, fidelity and interpretation.”* In line with Gibbs (2009:22), the transcription’s accuracy is important. For this reason the typed data was checked to ensure that it did not change the meaning of what was said during the interviews. The researcher ensured that the verbatim typed transcriptions were transparent of the data collected during the interviews. The researcher read through the data while making hand written notes to *“obtain a general sense”* (Gibbs, 2009:185).of the data before the coding of data commenced.

4.5 CODING DATA AS PER CONTEXT CODES

Wiersma and Jurs (2009:248) quote the well-defined description of coding from Weaver and Atkinson (1994:31) as: *“the strategy whereby data is segmented and tagged according to the researcher’s definition of units of meaning, so that those segments which have common or related meaning can be drawn together on one place for analysis”*. Before investigating the coding it is worthwhile to take note of the following: Robson (2002:290) amplifies the fact that it is too late to start thinking of analysing methods after the interviews have been completed.

The researcher therefore considered data analysis methods before the data collection process started. The interview structure in this study was thus set up with the aim to let the interviews inform the researcher of what he needed to know in order to broaden the knowledge context of this study.

According to Robson (2002:458) and Creswell (2009:187-189), the “*priori*” coding process is used to confirm predetermined themes in the research study. The data were divided into two smaller codes which were pre-determined, namely learner development and artisan development. Coding is the action taken by a researcher to apply meaning to raw data collected by assigning key words and phrases such as **learner development**, and **artisan development** as stated by Bloor and Wood (2006:101).

The coding process started with an overall perspective of the data by reading the verbatim typed data several times. The coding context means the data were organised and coded to ensure that the defined themes or words in the research questions could be analysed (Meyer *et al.* 2004:48). The researcher read through the transcription data and manually colour coded the specific codes as mentioned above as follows: learner development – orange; artisan development – green. The aim here was to make the information more visible in order to identify themes from the codes as explained by Marshall and Rossman (2006:161), when quoted by Whisker (2008:318). The themes were then divided into categories and sub-categories which are dealt with in the next session. The following themes were identified:

- Rigger Learnership
- Other Artisan learnerships
- Rigger Artisan Development
- Other Artisan Development

The coding, themes, categories, sub-categories were verified by an independent person who assisted as 2nd Coder to assure consistency of the coded material as discussed by Richards (2009:108). This person requested to stay anonymous but permitted the researcher to clarify his position as Principle of Further Education and Training (FET) College. He received his Masters in Education Degree at a local university in South Africa by submitting a Qualitative Design Dissertation. His experience and qualification in the same field as the researcher of this study proclaimed him to be an obvious choice as the 2nd Coder in this study.

4.6 CLARIFICATION OF CODES, THEMES AND CATEGORIES AS PER RESEARCH QUESTIONS

The clarification of the codes, themes, categories and subcategories as analogy can be expressed as an inverted tree as recapitulated by Gillham (2009:140).

- The tree metaphor portrays the trunk of the tree as the research title, which is the origination or starting point of the research.
- The thick branches represent the study codes.
- These branches then extend into two themes per branch.
- These themes are then amplified into categories and subcategories.
- The aim is to explore further information within the research topic (Gibbs, 2009:74).
-

The research questions were used to form the categories and subcategories as illustrated in **Figure 4.1** on the following page.

Inverted Tree Diagram of Category Formation

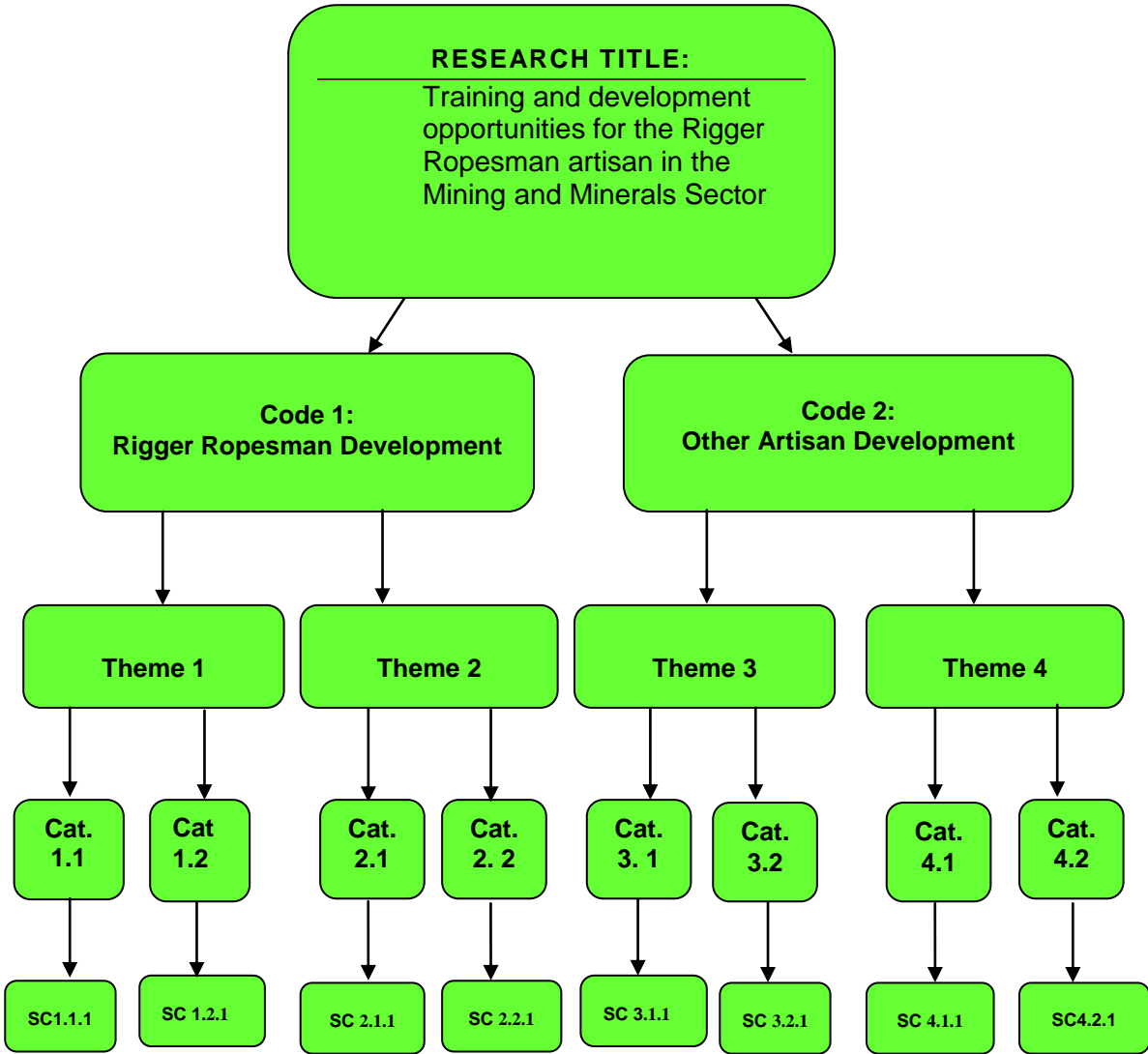


Figure 4.1: Inverted Tree Diagram of Category Formation

(Gillham, 2009:140)

4.7 INTERRELATED THEMES AND CATEGORIES RELATED TO SUBCATEGORIES

The themes and categories were divided into subcategories to explore the research questions set for the interviews. The open ended questions in the sub-categories enabled the researcher to quantify responses as affirmed by Dawson (2007:122).

The comparison mode is used for the data analysis as it provides a perspective on what the training and development opportunities the Rigger Ropesman offer in comparison with other engineering artisans such as the Electrician, Fitter, Plater/Boilermaker, Diesel Mechanic and

MC&I. This was used to establish possible training and development patterns as recorded in Mining and Minerals Sector Skills Plan and Anglo Platinum Workplace Skills Plans (2009:20).

All the identified codes, themes, categories and sub-categories are presented in Table 4.2.

Codes, themes, categories and subcategories via data analysis

Codes	Themes	Categories	Subcategories
1. Learnership Development	1. Rigger Learnership	1.1 Rigger Learnership Development	1.1.1 Rigger: Quality of Training and Development
		1.2 Contributing Factors	1.1.2 Rigger Career Guidance
	2 Other Artisan Learnerships	2.1 Other Artisan Learnership Development	2.2.1 Other Engineering Trades Quality of Training and Development Opportunities
		2.2 Contributing Factors	2.2.2 Other Engineering Trades Career Guidance
2. Artisan Development	3 Rigger Artisan Development	3.1 Rigger Earning Potential	3.2.1 Rigging Safety
		3.2 Rigger Artisan Numbers	3.2.2 Rigging Physical Demand
	4 Other Artisan's Development	4.1 Other Engineering Trades Earning Potential	4.2.1 Other Engineering Trade's Safety
		4.2 Other Engineering Trade's Numbers	4.2.2 Other Engineering Trade's Physical Demand

Table 4.2 Codes, Themes, Categories and Subcategories

4.8 INTERPRETATION OF THEMES AND DESCRIPTIONS

This section conveys the analysis and interpretation of the data gathered through the semi-structured interviews with the individuals, focus group participants, document analysis and literature review. The participants' quotes were not allocated to a specific participant as this is in line with the requirement described in Section 3.8. (The approach objective is to guarantee anonymity and confidentiality for all the participants who partake in the study). The themes, categories and sub-categories are conferred and expanded by literature, direct quotes from the participants' interviews and document reviews.

Please take note: The interview questions are included to clarify the content of the interpretations due to the fact that this field of research might be unfamiliar and confusing to the reader. The questions of the Researcher were indicated with the letter "R"

As this qualitative research aims to provide an in-depth analysis, as much of the relevant information was provided by stating the research question asked to the participant and then explicating the information obtained (King and Horrocks, 2010:151). The researcher discussed the question from the Rigger Ropesman's perspective as well as from the perspectives of other engineering trades such as Electricians, Fitters or Boilermakers. The discussions were grounded on the researcher's experience within the Mining and Minerals Industry engineering environment since 1987.

Quotations from the participants' interviews were transcribed verbatim. Therefore, the quotation reflects visible language or grammatical errors. The validity of interviews is judged by "*the contents of what is said is correct*" as referred to by Flick (2008:16) in quoting Legewie (1987:41). Gibbs (2009:78) states the value of coding data when he quotes the following explanation of Charmaz and Mitchell (2001:165): "*Coding provides the shorthand synthesis for making comparisons between: Data from the same people, scenes, objects or type of event (e.g. individuals with themselves at different points in time)*". The researcher intended to analyse and indicate the difference between learnership and artisan training, and development opportunities.

The researcher consequently selected the following two codes as indicated in Table 4.3.

<u>CODES</u>	
<p>1. Learnership Development: The Learnership development phase includes the enrolment, registration and training provided at the training centre and at the mine.</p>	<p>2. Artisan Development The artisan development consist of exposure at the various mine sections as well as the training development which lead to Engineering Foreman status.</p>

Table 4.3 Codes

The Themes, categories and subcategories will be discussed in the next section. The order in discussion and analysis will be done in the same order in which the interviews were conducted to ensure the correct understanding and spectrum in which the questions were asked during the interviews. The last column in each table will indicate the total number of participants (N=11), the Supervisor and Foreman combined number, the Artisan combined number and the Learners combined number as indication who responded to the questions asked during the interviews. The total number of participants was 11 persons.

4.8.1 Theme 1: Rigger Ropesman Learnerships

Theme1	N=12
1. Rigger Ropesman Learnerships	N=5

Table 4.4 Rigger Ropesman Learnerships

The following research question concerning the Rigger’s Ropesman learnership opportunities was posed to the participants during the interviews:

R: “Can you explain to me what the training and development opportunities are for a Rigger Ropesman learner and as artisan in the Mining and Mineral Sector?”

The participants clearly understood the training and development opportunities for a Rigger Ropesman learner and expressed their personal experiences as follows:

“you start by doing your learnership, you go to your phase one, you come back for your off-job training which is at the mines and when you are done, you go back to your training centre, ESTC, you do your phase 4, you go back to your off-the-job training modules and then when you are done, you go back to phase 6 and you write your trade tests”.

“It’s where we go to the training centre and do our modules and criterion test”.

“I came on our operation and do the on-jobs with the trainers about what we learned at the ESTC”.

“It’s where we got to have 4 subjects that is required as a learner”.

The above responses are the typical phases and activities that the learners experience during their learnership. The aim of the training phases is to *“teach, train and inform in a 21st century way”* as stated by Bayliss (1999:24). The process of the question is confirmed as truthful as described in Chapter 2.8 in the **Portfolio of Evidence (POE)**. The POE content is the reflective, signed off evidence of the progress made by the learner during his/her learnership programme.

4.8.2 Theme 2: Other Artisan Learnerships

Theme 2	N=12
2. Other Artisan Learnerships	N=2

Table 4.5 Other Artisan Learnerships

Theme 2 regarding the training and development opportunities for other artisan learnerships; was answered as follows:

“It is the same as the other disciplines”

“Eeh, the training is very good for both all the trades”.

The training and development for learners in all trades are based on the MQA accreditation guidelines whereby all training providers are audited to ensure the quality of learnerships throughout the SETA. This is necessary to conform to the prescribed quality standard of training and development. The following statement sums it up:

“Many education and training providers have applied for accreditation with the MQA and by doing so ensure that the training provided in the Sector is of an acceptable standard to the industry” MQA SSP Update (2009:16).

The responses for Theme 1 and 2 indicate that the participants agreed on the similarity of training and development opportunities for all the trades. The processes and phases run parallel without any major deviations and differences.

4.8.3 Categories 1.1 and 2.1: Development Differences

Category 1.1	Category 2.1	N=12
Rigger Learnership Development Differences	Other Artisan Learnership Development Differences	N=10

Table 4.6 Development Differences

The following question addressed the training and development differences amongst artisans:

R: *“Do you think there are differences in the training and development opportunities between the Rigger Ropesman and other engineering trades such as Electricians, Fitters or Boilermakers?”*

The replies from the interviewees were as follows:

“No the trainings is for both is brilliant, for all the trades it is exactly the same”

“No, not at all”.

“No, I think there is no difference because we get, we are doing the same phase tests and we are writing the same trade tests. Ya”.

“I think there is no difference”.

“I think there’s no difference, because at the end of the day we are going to write the same trade test from MQA”.

“I also think there is no difference, even the time we spend, we spend the same time, this other”

“Yes, if you are a Rigger Ropesman which means you are a mechanical, so you must follow the road of a mechanical. Ee.. like if you are in electrical, an electrician, you must follow the electrical road to become an electrical foreman”.

“I don’t think so, because if you start with your, if you are a qualified Rigger, you are just like a qualified fitter, if you need to be a foreman, they look at the development, it is the same development, you are going to go for the same courses that a fitter goes to and then you become a foreman”.

The learnership development among learners at the training providers follows the same trend or pattern during their learnership phases. King and Horrocks (2010:151) quote King *et al.* (2002:46-329) when they refer to *“integrative themes”*. These themes cut through a thematic theme structure (as in this case study). According to this structure all learners were guided

through the same learning process and only the content of engineering trades learning differed as replied by the above participants.

The Artisan Development Scheme at Anglo Platinum is designed into two categories namely the Electrical Foreman Scheme and the Mechanical Foreman Scheme. This incorporates differences with the related trades in the two engineering fields of development. The Electricians and MC&I artisans are developed to achieve the Electrical Foreman Certificate, while the Rigger Ropesman, Fitters Boilermakers and Diesel Mechanics are developed to achieve the Mechanical Foreman Certificate.

4.8.4 Categories 1.2 and 2.2: Contributing factors for training and development

The contributing factors for the differences in artisan training and development trends and patterns form part of the spectrum of the variance of the artisan trades in the Mining and Minerals Industry.

Category 1.2	Category 2.2	N=12
Rigging Contributing Factors	Other Artisan Contributing Factors	N=5

Table 4.7 Contributing factors

The following question was posed to the interviewees:

R: *“What do you think are the contributing factors to these differences?”*

The responses from the interviewees were as follows:

“For the artisans, the training serials for short courses is less than for electricians and boilermaker, to train the people”.

“Eeh, electricians and your artisans, boilermakers and fitters got the broader field than Riggers. Riggers is normally only for ropes and to uplift and move the stuff, for where artisans has a broader field, so you got your knowledge to apply to the standards you need”.

“I don’t think so, because if you start with your, if you are a qualified Rigger, you are just like a qualified fitter, if you need to be a foreman, they look at the development, it is the same development, you are going to go for the same courses that a fitter goes to and then you become a foreman”.

“Technology”.

“Responsibilities”.

The short courses referred to in the above responses are the artisan trade specific courses presented at ESTC. The following Rigger Ropesman courses were designed since 2000 in accordance with specific mining industry client needs:

- Inspection & Maintenance of Hoist Ropes
- Inspection & Use of Overhead, Gantry and Jib Cranes
- Rigging Skills
- Safety Detachment Hook
- Resin Capping

The smaller number of Rigger Ropesman courses (5) as mentioned above in comparison with Electrician courses (20) presented at ESTC is a reality. The reasons for these courses include the following:

- In terms of qualification registration, the Rigger Ropesman trade is smaller than the Electrician trade due to number of tasks included in the qualification.
- The “*broader field*” as mentioned by an interviewee is evident as the Electrician is a well-known, popular and high in demand occupation that is used in more industries than the Rigger Ropesman occupation.
- “*Technology*” plays a major role in the need of artisans. In the Rigging field technology causes trade reduction instead of trade growth, for example crane operations for lifting and moving of loads are done by all trades artisans or Crane Operators instead of Riggers. This is because of the upgraded technology and safety technology incorporated in crane designs. Riggers are replaced by electronic technological designs that perform the tasks that a Rigger would have performed, for example measuring and determining the mass of a load. Crane Operators these days use a Load Cell device to determine the mass of the load or object. In the past the Rigger would calculate the mass of the load or object.
- “*Responsibility*” seems to be a non-technical issue but it surely makes a difference in career development and opportunities. The researcher recalls his own experience to a scenario where he acted in an Electrical Managerial position for six months. When the position became vacant he was told not to apply since he was not an Electrician. As a

result he could not take (or sign for) the electrical legislative responsibility of the training centre.

Willis (2008:202) explains the use of multiple data sources (such as the researcher’s own experiences) in qualitative research on data analysis and interpretation. Multiple data sources were used throughout this study and it is clear that the sources influence each other. In turn, this leads to the amendment of data and information.

4.8.5 Subcategories 1.1.1 and 2.1.1: Quality of training and development

Subcategory 1.1.1	Subcategory 2.1.1	N=12
Rigger Quality of Training and Development	Other Engineering Trades’ Quality of Training and Development Opportunities	N=6

Table 4.8 The quality of training and development opportunities

The quality of research analysis is summarised by Mouton (2008:159) as the *“Combination of qualitative and statistical methods of analysis”*. The researcher included the question below into the interview questionnaire to ensure that the responses to this question would lead to a qualitative analysis training provider’s training and development. The aim is to ascertain training quality standards within all the trades catered for.

The training quality question posed was the following:

R: “Would you say the training and development provided for the Rigger Ropesman are of equal quality as the training provided to the other similar engineering trades that we talked about?”

The interviewees answered the following:

“Not the same. The other, it is just that other trades they get more courses than Rigging, but the quality is the same”.

“Yes, it is the same”.

“Mmm, yes, it is the same quality”.

“Yes, the qualities are the same”.

“Yes, it is equal qualities – the same”.

“Yes, I can say it is similar, because there is MQA ISO who regulates all the training, so the training quality will be equal”.

The interviewees agreed that the quality of training provided for the Rigger Ropesman and the other engineering trades were of the same quality standard. The one participant answered that the “MQA and ISO regulates the training.”

Wiersma and Jurs (2009:232) cite Lancy (1993) when verifying epistemology or assumptions in qualitative research. Lancy (1993) stated: *“The researcher operates in a natural setting in order to avoid missing something important”*. In this research study the natural setting for the learners was the training centre where the trainees attended long periods (\pm 15 continuous weeks per year) during their learnerships. The sustainability of the MQA accreditation and the ISO 9001:2008 quality audits formed part of the learning interventions as the learners were made aware of the procedures, standards and criteria to be audited as scheduled. The awareness of the quality of training and development amongst all trades unites with the Quality Objectives of the training centre which specify the objectives as to:

- Provide quality training to our learners
- Maintain MQA Accreditation
- Sustain ISO 9001:2008 Accreditation

The above undisputed comparison complements the training and delivery provided by the ESTC.

4.8.6 Subcategories 1.1.2 and 2.1.2: Career Guidance

Subcategory 1.1.2	Subcategory 2.1.2	N=12
Rigger Career Guidance	Other Engineering Trades Career Guidance	N=12

Table 4.9 Career Guidance

The issues of career guidance and career choices were raised during the interviews:

R: “Did you receive any career opportunity, development and guidance to become a Rigger”?

The responses to the above question were as follows:

"No, I haven't receive that one, I was just told that they only have Rigger Ropesman position, you take it or you leave it".

(1.1) "No, I had a chance to go to be a plater ... boilermaker, but I choose to be a Rigger".

"Yes, actually, I have a lot of them. 2 years after I qualified as a Rigger, they ask me if I want to develop myself, which discipline would I feel comfortable to work with so that I can get the development, then they took me to MCNI, which is instrumentation, and I did my learnership, finish everything and I wrote my trade test, and passed, wait for 2 years again and they looked into another development, then I went to a programme, to Plant Maintenance Officers Programme, as we speak now, I am a Plant Maintenance Officer for one and a half years".

"No, not at al".

"No".

(1.2)"Yes, I provide that for them because at this stage the ratio for on the mine – you need more electricians and more fitters and more boilermakers according to the Rigger. To give you an example, for the Rigger you need one Rigger for per shaft to do the slinging and all that work where you need ten electricians, so the job opportunities there is much more than for Riggers, and ya, that is the reason for..."

"I didn't get any training about Rigging but as I was working in the operation for 5 years, I used to see how the Riggers were doing their jobs and the electricians and all the other trades".

"I wasn't exposed to Rigging. I saw Rigging at the ESTC".

"No exposure".

"I've never heard of what is Rigging before, but I knew it only on mining when I just joined mining, so I learned to know what is Rigging".

"I knew all about other things like electricians, boilermakers and all that stuff".

"When you apply for learnership, there's more people rushing for electricians and fitting and the other, so in Rigging, there is less competition".

"And then, on FET Colleges, we've got less information about Rigging only because the electricians and other fitters and boilermakers, that's why most of the guys they go to other trades".

The reflection of career guidance to become a Rigger Ropesman in accordance with the above interviews clearly indicates that career guidance is not extended to the Learnership applicants. The interviewees confirmed that other influences, such as verbal notifications, mine position vacancies, previous mine exposure, and mine vacancy ratio demands, actually challenged them to become Riggers, without them making a personal choice in terms of considering this as a career . The researcher had a similar experience in January 1987 when he approached a gold mine for a position. He asked to be enrolled as an Electrical Apprentice but was told that he was going to be a Rigger apprentice. On enquiring what it meant to be a Rigger, he was told that he would see what it means at a later stage.

Interviewee (I.1) had the choice between Rigger and Boilermaker and became a Rigger Learner. She made excellent progress and qualified as Rigger artisan. She then decided to start another learnership as MC&I Technician and also completed that successfully. She then approached the Planned Maintenance Office career and is currently still occupied in this position. Two of the other interviewees made progress and qualified themselves as Mechanical Foremen.

Interviewee (I.2) was involved as Learnership Recruiter and therefore stated that he did provide career guidance in accordance with the “mine’s ratio demand”. The choice of the applicant will therefore certainly be influenced by available vacant positions instead of knowledge about the different artisan trades. There has been an increase in employment opportunities in middle-level occupations such as artisans and associate professionals, and these opportunities must be highlighted and educated to potential learnership applicants in order to stimulate the artisan growth process in South Africa as confirmed by Coetzee *et al.* (2007:5) when referring to DOL (2005). The career guidance topic is included in the recommendations of this study in chapter 5.

4.8.7 Themes 3 and 4: Trades Development

Theme 3.1	Theme 4.1	N=12
Rigger Artisan Development	Other Engineering Trades Development	N=9

Table 4.10 Trades development

The Rigger and other artisan development questions were aimed at investigating the choice made by the learners to become Riggers.

R: “How did you become a Rigger Ropesman learner”?

The responses were the following:

“I heard of any engineering until I found out when they told me I am going to be a Rigger”.

“Eeh, I applied for a learnership and then I didn’t decide that I wanted to go to a Rigger, but I applied for a learnership so they decided that I must go to Rigging. But as I was saying, that I saw Rigging at my operation, so I decided no, it is good, I will take Rigging”.

“Yes. When you apply for learnership, there’s more people rushing for electricians and fitting and the other, so in Rigging, there is less competition”.

“For me, it’s like, I wanted to know more about it, so that’s why I decided on Rigging”.

“I saw the learnership, then I applied for that learnership and then actually I didn’t want to be a Rigger but because of the score that I’ve got on the learnership, they decided to put me on the Rigging and I ended up enjoying it and continuing it”.

“I applied for a learnership, so my supervisor chose for me to be a Rigger”.

“Yes. I applied and did the assignment, then they submitted us to our trade according to those assignment. So the high score was for Rigging, so I went for Rigging”.

“Well, I was selected by the Manager Engineer. He explained to me what a Rigger is and that there is no other opportunities to go for electrician or fitter and that he can help me with a Rigger Ropesman apprenticeship, and he explained to me what it is and I was interested”.

“I did apply for a electrician, but eh the answer was said that the electricians are full, so they give me a Rigger Ropesman”.

When analysing the above responses, the influence of mine officials in persuading learners to take up learnership positions was quite evident. Several reasons, such as aptitude tests (called learnership tests, assignments), whether correct, truthful and ethical or not, were used to convince the learners to become Riggers. The decision of the official to inform an applicant that he or she would be a Rigger is not a fair career choice and should be discontinued.

The selection of learners will be addressed in the next chapter as these trends and patterns during learners’ recruitment and appointment is obviously not a strong growth point in any company or mine environment.

4.8.8 Categories 3.1 and 4.1: Earning Potential

Category 3.1	Category 4.1	N=12
Rigger Earning Potential	Other Engineering Trades Earning Potential	N=7

Table 4.11 Earning potential

The obvious question related to any occupation is its potential salary scale. The following interview question was posed to the participants:

R: “Do you think that the earning potential, of the other trades has a bearing on the selection of the Rigger Ropesman”?

The question was asked in the *inductive* format where the specific instance is withdrawn from conclusions on the population and numbers of the Riggers in comparison with other engineering trades as explained by De Vos *et al.* (2010:47) with reference to Leedy (2001:35).

The earning potential question asked was responded to as follows:

“No, I don’t think so, because between them there is no differences”.

“Not really. The boilermaker, the fitters, and the electrician get the same, and the Riggers get the same salary excluding the instrument mechanician, but as we speak now, they are the same, the entry level is the same”.

“No, the earnings is exactly the same. The Rigger and artisans and electricians are exactly the same”.

“No, I don’t think so”

“The earning are the same also”.

“I think the salary is the same, it is just that people they do not understand Rigging, so they don’t go to Rigging, but the salary is the same”.

“I think others they are afraid of Rigging, only because we work much time than the other trades, and maybe it is because we are getting more money because of the overtimes and things like that”.

The participants’ responses confirmed that the earning potential of artisans on the mine did not influence their choice not to become Riggers. On the contrary, some of the participants thought that, due to overtime, Riggers might be earning more than workers in the other trades. The rationale for this perception is that Riggers do all the maintenance and repair work during

weekends when the production of the mine is at its lowest cycles and the machinery and equipment can be maintained and repaired.

4.8.9 Categories 3.2 and 4.2: Rigger and other artisan numbers

Category 3.2	Category 4.2	N=12
Rigger Artisan Numbers	Other Engineering Trade’s Numbers	N=6

Table 4.12 Rigger and other artisan numbers

The capacity of the Rigger Ropesman trade can be observed from the statistics and mining reports. These are dealt with after the following responses of the interviewees to the question:

R: *“Why would you say is there such a difference between the numbers of the Rigger Ropesman and the other similar engineering trades”?*

“Yes, there is a big difference. The numbers for Riggers is much smaller than for other trades”.

“Ehm, at the working area, the Rigger’s job is less demanding than the other trades like electrician, boilermakers or the fitters”.

“It all depend on the section we work, if we are at the conveyer section or pump station section, the demand for the fitters and electricians is higher, and ... ya well ... if you work on the shafts, also the ropes that you need to maintain, also require actually 1 Rigger per shaft and maybe 2 electricians and 2 fitters and 2 boilermakers due to the fact of the maintenance”.

“Because there is no career guide for people about Rigging, for these people they don’t now what is Rigging or Rigger Ropesman, so they don’t have much info on the trade itself”.

“I think it is only because, like, when comparing to the other trades, they get more information about other trades than about Rigging, because most of us didn’t get information about Rigging”.

“Just mainly they see that there is not too much jobs available to many people in that field”.

The interviewees’ information is valid in the sense that realistic “World One” truths were expressed. The demands for Riggers are much smaller than for other trades in the Mining and Minerals Industry. This is due to the task requirements within the engineering fields. The

Rigger Ropesman tasks include the start and completion of an activity. Other trades perform smaller but more continuous repetitive tasks, which mean that more persons are required on a continuous basis. The total spectrum of the engineering field in the Mining and Minerals Industry requires artisans to maintain the systems and processes while the Rigger Ropesman responsibility is focused on Shafts, Winders, Steel Wire Hoist Ropes, and the lifting and moving of loads. The spectrum of the Rigger Ropesman trade itself is smaller and more defined than the bigger trades such as Electricians and Fitters. Chapter 2 explored the statistics regarding artisan and learnership numbers in Tables 2.10, 2.11 and 2.12. Career guidance was highlighted as a reason for the smaller numbers, while the demand for artisans was a primary determined factor in the appointment of an artisan.

The following questions were more physical orientated as these factors cannot be separated from the Rigger Ropesman trade requirements.

4.8.10 Subcategories 3.1.1 and 4.1.1: Rigger and other engineering trade’s Safety

Subcategory 3.1.1	Subcategory 4.1.1	N=12
Rigging Safety	Other Engineering Trade’s Safety	N=12

Table 4.13 Rigger and other engineering trades Safety

The following question was asked to the interviewees:

R: *“Would you say the dangers and risks involved in Rigging has an influence on the person’s choice to become a Rigger?”*

The following responses were received from the interviewees:

No. Yes. I would say yes.

Because sometimes other people are afraid of working at heights.

And they think if ever I become a Rigger then I would be going up there and what if ... then...

I would say yes because a lot of people are afraid of working with heavy stuff.

Heavy stuff, they all want to work with fine things.

So, it is dangerous. To what they said, most of us are not exposed to Rigging, so I cannot say that because of the physically things and challenges, we don’t know what is happening at Rigging until we see Rigging.

Yes, you find different kinds of Riggers, Riggers who are working at heights, not everyone is happy with working at heights. Eeh... slinging all the cages, lots of people

depends on the slinging of on the splicing of the Rigger, so the difficult part and the danger part for Rigger that you must take responsibility, is much higher, eeh.. and a Rigger is direct responsible for that people and some people don't want that – to take that responsibility.

Yes, if someone thinks about the winders, heights, ee, heavy loads, hey, it is a bit difficult.

Ya, for some individuals, they look at the way the Riggers are working, doing such dangerous work, for some people, yes it is not that big challenge for them.

Yes. Yes, working at heights is one of the areas, danger areas.

I think people are just scared when they see what Riggers are doing, they think it's a... I don't know, risky,

I think no, because each and every trade it has its dangers, like working with electricity is very dangerous. So I think every trade has its dangers, like boilermaking, they are in danger because of they are using gasses.

With the exception of one participant all the other participants agreed that the dangers and risks included in the Rigger Ropesman's trade influence the person's choice to become a Rigger Ropesman. The responsibility factor and hazardous circumstances (such as working at heights) require the Rigger Ropesman to display confidence and trust in the preparation processes before the actual task is started. Risk assessment management is a major factor in this engineering field as the consequences for non-compliance are undesirable. Recommendations in this regard are made in the next chapter.

4.8.11 Subcategories 3.1.2 and 4.1.2: Rigger and other engineering trades' physical demand

Subcategory 3.1.2	Subcategory 4.1.2	N=12
Rigging Physical Demand	Other Engineering Trade's Physical Demand	N=7

Table 4.14 Rigger and other engineering trades' physical demand

The last question during the interviews was as follows:

R: "Do you think the physical activities and work influence the person's choice to become a Rigger"?

Several interesting responses were received regarding the physical demand of a Rigger.

“Ya, because, let’s say, they have been working in the mine as an assistant, maybe I’m working in the process as an operator, so I saw some Riggers are working, then I would say that they are working hard and I would say, NO, I don’t want to become a Rigger, so that’s why I say...”

“I think even the equipment Riggers they are using, people they are scared of them, like chain blocks, they think chain blocks, it is not easy to work with the chain block, but they don’t know if you are using it in the right way and using the right size of a chain block, that will make your work easier.”

“Absolutely yes”.

“Yes”.

“Yes, when you are already in the field, there is chances that people might be afraid of choosing to become a Rigger Ropesman, because they look at how the Riggers are working, but for other people, they don’t know what is Rigging, so they won’t decide whether they want to become Rigger or not, because they don’t have much info”.

“Ya, of course yes. Because a Rigger must do splicing with spikes and that stuff, eeh ...you don’t work with small spanners, so the people must have got a little bit of power to do splicing and all that stuff, so it cannot be a thin guy so it must be ...all that stuff, that it ai... really the person must have got the power to do Rigging work”.

“Yes”.

In the real “World-One” it is evident that Rigging includes physical activities in completing Rigging tasks. The researcher worked in Gold Mines for ten years as an Underground Rigger Ropesman. The period between 1987 until 1997 will always be remembered as the physical years in his career. The experiences of working between 16 and 24 hours non-stop on major tasks created respect and endurance characteristics that other persons might desire but do not want to experience in their working environment. The physical demand of the Rigging tasks could be very strenuous. If the correct methods are applied these tasks may however become durable and achievable for a person. The participants acknowledged the physical demands of the occupation. Nevertheless, not one of them mentioned their intention to step out of the trade. Pride in the physical occupation is visible in a worker’s attitude and in the satisfaction of having successfully completed the task. The physical demand can therefore be managed indeed. This is further confirmed by the numbers of female learners enrolled as Rigger Ropesman learners.

Recommendations regarding Rigging Plans are made in Chapter 5.

4.9 VALIDATION OF DATA

The **Validity** of qualitative research has been argued by Bloor and Wood (2006:148), “*Data validation reflects the need to improve understanding (rather than accuracy) in terms of the research subject.*” In this research study the concept of understanding the research topic and the underlying engineering trades involved in the study were prioritised and expressed in ways to ensure the reader will comprehend the meaning of the study at large.

This study’s main aim is therefore to create a clear understanding of the training and development opportunities of the Rigger Ropesman in the Mining and Minerals Industry. Another approach in analysing the interview situation is to assure the degree of authenticity in order to bring justice to the issues in the study (Flick 2006:373). The validity of the data deals with what we intend to do in the research study, thus the believability of the data which is supported by the credibility of the participants in the research study (Mertler and Charles 2009:199).

The interviews were verbatim typed and audio recorded as evidence to ensure the credibility and validity of the method concluded. Quotations from the participants’ interviews were verbatim transcribed. The validity of an interview is judged by “*that the contents of what is said is correct*” as referred to by Flick (2008:16) when quoting Legewie (1987:41). Individual and Focus group interviews were used to gather data. This confirms that more than one source of data was used to bear on a single point.

4.10 RELIABILITY OF DATA

This qualitative research study applied the criteria of **Reliability** to assess the qualitative research performed with data collection methods such as verbatim interviews and dependability of data as correlated by Flick (2006:371). Leedy and Ormrod (2005:93) stipulates that **Interrater Reliability** is a measurement criterion where two or more individuals or researchers evaluate the same product and give the same result (where the characteristic or interview questions remained unchanged). This applies to this study as the same questions were used with all participants. Using a consistent standardised instrument form one situation to the next (one interview to the next) improves the reliability of the instrument.

4.11 DATA TRIANGULATION

The credibility of the methods used in this research study is enhanced since the techniques of using more than one data source focus on a single point. The independent input and perspective was also utilised in this aspect. This technique is known as **Triangulation** as referred to by Glanz (2006: xiv) in quoting from Marshall & Rossman (1999:146). The interviews were scheduled on separate dates, times and venues by the researcher. This was done to accommodate the participants but also to assure greater awareness of the research question as observed by the participants. The view and responses of the participants are addressed in Chapter 4 of the study. The different data sources of information are examined and used to construct a coherent justification for establishing the themes for data analysis and interpretation (Creswell 2009:191).

4.12 CONCLUSION OF DATA ANALYSIS AND INTERPRETATION

Marshall (2006:163) correlates several models of report writing when she refers to Patton (2002:503) presenting *“balancing description and interpretation. Description provides the skeleton frame for analysis that leads to interpretation”*. This describes the typical phase description for this study at this stage, as the analysis and interpretation phases are within the context of Chapters 4 and 5. Chapter 4 dealt with specifics in the collection of the raw data including the physical interaction with participants which included the conducting of the interviews. The collection of the demographical information formed part of the interaction with the participants. The researcher organised and prepared the raw interview data for content analysis. The verbatim transcription of the interview data was clarified and it was ensured that the data would be available as and when needed. The coding of the data was the starting point of setting the themes, categories and sub categories to be described, analysed and interpreted.

The presentation of the “Inverted Tree” set the image of the codes, themes, categories and sub-categories of the analysis process which were then laid-out in Table 4.2 Codes, themes, categories and subcategories. Section 4.8 described the analysis and interpretation of the data gathered through the semi-structured interviews with the individuals and focus group participants. The validation, reliability and triangulation of data, concluded the chapter. In the words of Mouton (2008:124), Chapter 5 can be described as the *“concluding most important chapter in the thesis as it presents the end product of the endeavour.”* The chapter emphasises the contribution, findings and recommendations of the study.

CHAPTER 5

FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.1 INTRODUCTION

In the previous chapter the specifics in the collection of the raw data including the physical interaction with participants which included the conducting of the interviews were verified. The collection of the demographical information was a portrayal of the status of the participants in the study. The raw interview data for content analysis were discussed. The verbatim transcription of the interview data was clarified. The coding of the data launched the setting of the themes, categories and sub categories to be described, analysed and interpreted. The data validation, reliability and triangulation with the conclusion closed off the chapter.

This chapter concludes the study with regards to Rigger Ropesman artisan trade, which is evidently not as renowned and well known by the public as the more exposed artisan trades such as Electricians, Fitters or Boilermakers. The Rigger Ropesman trade nevertheless plays a role player in some industries, such as the Mining and Minerals Sector, Construction Industry and Chemical Industry. In the engineering environment the Rigger Ropesman is in demand for its ability to lift and move heavy loads and equipment. This study aimed to re-consider the training and development opportunities of the Rigger Ropesman specifically within the Mining and Minerals Sector as the trade is legislatively linked to this sector. The Mines Health and Safety Act (MHSA) – Act 29 of 1996 and the Occupational Health and Safety Act (OHS) – Act 85 of 1993 stipulate the legislative requirements of the Rigger Ropesman within the mine. These requirements include the Rigger Ropesman's responsibility with regards to the following: Shafts; winder ropes; installing and maintaining Rigging lifting equipment, lifting machinery, and lifting tackle; and safe lifting practices on the mine.

The research questions in the study revolved around Rigger Ropesman training and development; differences between the Rigger Ropesman and other engineering artisan trades as mentioned; the training quality; and the safety and physical demand aspects of the trade in the mining environment. These questions are due to variable artisan trade numbers when compared and due to the multiple required scenarios in which the Rigger Ropesman must be able to work and perform. The study's qualitative orientation method aimed to gain information "*out of the horse's mouth*" in the sense that participants were randomly selected to take part in

the study. The participants and documentary information, for example the numbers of learners trained during a certain time frame; all reflected their direct involvement with the trade.

This chapter allows the researcher, who was directly involved in the study as author, interviewer, field worker, listener, reader and event planner to summarise, conclude and interpret the study findings as stated by De Vos *et al.* (2010:353) when referring to Rossman and Rallis (2003:337).

This chapter will deal with the Rigger Ropesman trade's contribution to the study, the specific company involved in the study, namely Anglo American - Platinum, and the MQA. The creation of sustainable support and working environments in a diverse educational context such as the SETAS and the Mining and Minerals Industry within the ETD field will be discussed. The sustainable empowering in learning environment within learning institutes will be dealt with and the findings and recommendations will finally be projected.

5.2 CONTRIBUTION OF STUDY

5.2.1 Contribution of study towards the Rigger Ropesman trade

The Rigger Ropesman trade is not concealed as an individual artisan trade that operates and functions independently from other engineering trades. The reality indicates that this trade largely depends on other trades for job creation and demand. The new and current designs, construction and development in the engineering and mining world constitute the need for the Rigger Ropesman as artisan to render a service in the installation, construction and maintenance of equipment in these fields. New mining and engineering development and projects raise the demand for trained, skilled and competent Rigger Ropesman in the process flows of such projects.

It is therefore imperative for Rigger Ropesman learners to ensure that they grasp opportunities to enrich their learning intervention with knowledge and experience in order to position their status as qualified artisans that will be in demand by other companies and organisations. A good example in this regard is one of the female interviewees that participated in this study, who received three different job offers from three mining plants after she had completed her trade test. This reaction clearly indicates that this learner did more than what was expected of

her. She excelled in her learning interventions to become an outstanding candidate for new job opportunities and challenges.

This study aimed to comment on the career opportunities and development of Rigger Ropesman within the mining and engineering field. The awareness of Rigger Ropesman learners must be awakened by creating an understanding of the existence of equal learning and development opportunities within the Mining and Minerals Sector. Evidence of these opportunities was indicated by three of the ten interviewed Riggers Ropesman who made progress in their careers either by becoming Mechanical foremen or by moving into advanced positions within their working environments.

The researcher demonstrated in his career that progress and promotion lies within the personal development aspirations of the individual. Moving from apprentice to managerial status is possible for a Rigger Ropesman provided that the concept of development forms part of the individual's daily work and dedication to advance his/her career. As highlighted in this study, mental inspiration influences the individual's frame of mind on a daily basis and therefore plays a major role in the self-development targets that he/she sets for him or herself. The Rigger Ropesman's motivation therefore includes his/her awareness of career opportunities.

5.2.2 Contribution of the study towards Anglo American Platinum

The researcher regards himself fortunate to be a staff member of Anglo American – Platinum for several reasons. It is a kind and honourable status to be able to be healthy and involved in daily responsibilities at work. This is more so when being involved in the training and development of people who will contribute to the growth of the economy by the output of their occupations.

This study aspires to contribute to this company by confirming the positive feedback received from the interviewees who participated in the study. Their confidence in the quality and content of their learning experience supplements the training delivery of ESTC and staff members involved. The realistic and constructive feedback regarding the learnership development programme underline the learners' holistic approach regarding the progress anticipated for the learnership phases.

A matter of concern is the process applied by mining staff members when learners are selected for the various artisan learnership trades, for example the trade of Electrician, Fitter, Boilermaker, MC&I, Diesel Mechanic and Rigger Ropesman. The Learnership Recruitment and Selection Strategy appear to not be applied. This chapter will address findings and recommendations in this regard.

5.2.3 Contribution of study towards the Mining Qualifications Authority (MQA)

The MQA will surely benefit from this study if the training and development of all learnerships and artisans are executed and managed without any of the concerns mentioned in the study. The MQA accreditation focuses on several factors and criteria to ensure quality training of the highest possible standard and status by accredited training providers. The actual engineering standards, quality of equipment, learning facilities, workshops and lecture room venues are all included in the audit criteria as pre-requisites for accreditation.

The researcher has been involved in numerous audits with MQA ETQA members to accredit training providers in South Africa and Botswana. The exposure to these audits adds value to the prominence of training providers' quality training. Requirements for training centre lay-outs and pre-audit inspections form part of the researcher's liaison with other training providers for the MQA. The study's contribution to the MQA will serve as recommendation for the ETQA to set selection criteria for learners within engineering trades. This would eliminate the trend by mines to appoint learners in positions of trades that are irrelevant in terms of learners' interests and career guidance. The MQA supports objective decision-making with regards to learnership skills development. Objectivity in this matter will minimise the incorrect placement of learners.

The next section will set out the role of the SETA in the working environment of the learner.

5.3 THE ROLE OF DIVERSE EDUCATIONAL CONTEXT IN CREATION OF SUSTAINABLE SUPPORT AND WORKING ENVIRONMENTS

According to the Human Resource Development Strategy for South Africa 2010-2030 (2009:8) when referring to Ziderman (1997:352), South Africa uses certain HRD terms and phrases repetitively as the need for specific changes has become the field where many countries seek a competitive advantage. Terms such as "training and development", "skills", "qualifications" and "competence" have become integral key terms in the public vocabulary.

The educational and qualification diversity causes discomfort for a person who is not exposed to the latest ETD transformation paradigms in the country. The working environment had to adapt to new legislation to accommodate these transformational trends to ensure they are affiliated in this process. The Skills Development Levies Act (1999) is a realistic example of what companies had to cater for. Meyer *et al.* (2004:11) confirm that training legislation regulates the training interventions in South African organisations. The sustainability of working environments are influenced by the ETD practices as it impacts on human resource development in organisations.

ETD components support the main activity or purpose of the company's work to be performed by skilled and competent persons. Erasmus and Van Dyk (2003) define *education* as “*the activities directed at providing the knowledge, skills, moral values and understanding required in the normal course of life*” (Meyer *et al.* 2004:16). In other words, education starts during childhood and continues in the life cycle as the components mentioned in the definition do not expire in the human life. *Education* subsequently fulfils a fundamental role during times of unstable and diverse scenarios in the work environment and its development phases.

The *training concept* of ETD is focused on certain criteria and specified skills to enable a person to successfully complete a task. Training delivers the capability of a required new skill needed in the work environment. In turn, this creates sustainable of delivery of required tasks. The *development concept* spreads a broader spectrum whereas development programmes are created to set opportunities in order to develop the employees of a company instead of the individual. These trends improve and maintain high levels of competitiveness in organisations which stimulates the growth and development of the employees Meyer *et al.* (2004:16).

In summary we can say that the creation of sustainable support and working environments within diverse educational contexts such as the SETAS and the Mining and Minerals Sector ETD field is beneficial because of the following reasons:

- I. The ETD processes and advancement made by the improvement in the working environments.
- II. The improved quality of life for the employees
- III. Freedom of potential of employees is created within their working environment.

The following section highlights the role of the SETA in learning environments in learning institutes.

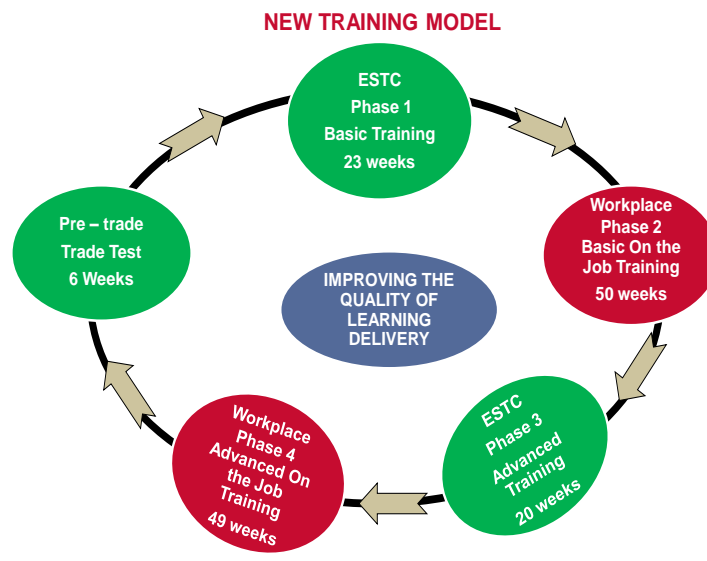
5.4 SUSTAINABLE EMPOWERMENT FOR LEARNING ENVIRONMENTS IN LEARNING INSTITUTES

The previous section discussed the essential contribution that the ETD brings to the enhance sustainability within employees' work environment. The motivation for the role of the ETD in the work environment and work force is the mandate of skills development support provided by the MQA. The role of the MQA includes administering skills development initiatives, skills programmes and learnerships. The framework is to "ensure that the Mining and Minerals Sector has sufficient competent people who will improve health and safety, employment equity and increase productivity" MQA Pocket Sheet (2012). The learning institutes or learning providers accredited by the MQA are monitored and evaluated by reviewing their training delivery, capacity and quality of skills development within the Mining and Minerals Sector. The ESTC as official engineering training provider for Anglo American-Platinum continuously strives to improve the end product of their core business, which is learner competence. The quality of training delivery are continuously monitored and improved where possible. Several additional initiatives were launched to increase the productivity and learning experience of learners during their learnership programmes.

Two of the most current initiatives are:

1. The initial Phase One learning phase was completed at the ESTC where the training period was 15 weeks. During site visits to the mines by ESTC staff members and feedback from engineers during meetings, the concern was expressed that learners lacked skills after Phase One and Phase Four at ESTC as their exposure to various tasks were limited.

2. The "New Training Model" schedule was introduced whereby the exposure of the learner was drastically increased to longer periods at ESTC. For example, Phase 1 was extended to 23 weeks while the second year Phase 3 was extended to 20 weeks. The purpose of extending the time was to increase both productivity and learning experience. The on-the-job Phase 2 and Phase 4 were increased to 50 and 49 weeks respectively. The feedback from the mines during the last three months clarified the "New Training Model" (Figure 5.1) as a tremendous improvement in competence of learners.



1

Figure 5.1 The New Training Model

- The other training quality initiative by the ESTC and Occupational Skills Development On-the-job training colleagues was to re-design the MQA On-the-job modules into Learner-On-Job Portfolios. These portfolios include an Introduction, Safety Risk Assessment of task, Outcomes, and Process of task. The signatures of the learner, Coach and Assessor must appear on the marking sheet of the task and the number of times the task was performed must also be indicated. The task must be performed several times as the learner must be able to demonstrate that the task has been mastered and not just done once.
- These two initiatives contributed to the self-confidence, ability and skills of the learner since the focus was re-aligned for the learners to become masters in their learning. The learners who participated in this study experienced the above initiatives and responded in their interviews being exposed to the above initiatives. The initiatives did not have an impact on the Rigger Ropesman trade related interview questions as the initiatives were practised across the full spectrum of all engineering learners without exception of specific trade.

The role of the MQA is to support the above initiatives and similar scenarios as role modules for other training providers in the SETA. A last comment regarding the MQA is the complimentary adapted culture that it creates amongst training providers. The culture is endorsed whereby learning institutes support one another to provide quality training and development instead of competing against one another. The view is that artisans for the country is trained and

developed. The sustainability and empowerment of learning environments in learning institutes are therefore supported. The next section looks at the findings of the study.

5.5 FINDINGS

The findings of this study should clarify the main research question and outline the other questions that were asked during the study. The aim is to demonstrate whether the end result is being achieved or not as referred to in the theoretical assumptions as mentioned in Chapter 1.7.2 as the following:

The theoretical assumptions of this study:

- There should not be variance between the training and development of the Rigger Ropesman and that of other similar engineering trades.
- If such a variance exists, what are the contributing factors?
- The Rigger Ropesman's training and development opportunities must enjoy equivalent status to other artisans in the Mining and Minerals Sector.
- The Rigger Ropesman's quality of training and development must be congruent with other artisans in the Mining and Minerals Sector.
- Career development opportunities for the Rigger Ropesman must be equivalent to that of all artisan trades in the Mining and Minerals Sector.

The end result of the study will set the platform to address the challenges recorded regarding training and development opportunities within the Mining and Minerals Industry. The next section will elaborate on the results of the Themes, Categories and Subcategories in relation to the abovementioned theoretical assumptions.

5.5.1. Theme 1: Rigger Learnerships and Theme 2: Other Artisan Learnerships

The main research question is the basis of this research study:

R: "Explain what the training and development opportunities are for a Rigger Ropesman learner and an artisan in the Mining and Mineral Sector"?

The research question clearly indicate the aim of the study to identify the training and development opportunities of a specific trade, therefore the training and development opportunities in other trades mentioned in the study are not elongated on, as it would deviate from the core value of the research question in the study. The researcher did not consider using learners or artisans from other engineering trades in the study, such as Electrician, Fitter, Diesel Mechanic, MC & I, Plater Boilermaker as they would not have insight or knowledge of the Rigging related research questions. The interviewees clearly indicated their understanding of the learnership process and how the qualified artisan status should be achieved.

The other part of the question related to artisan development opportunities. The progress route in becoming a foreman was not clearly spelled out by the focus group interviewed as their status priority as learners focused on learnership development. A recommendation should be made for learners in this regard. The artisan interviewees were all familiar with learnership development. They were all able to explain the Foreman certification scheme with ease. The training and development opportunities for the Rigger Ropesman in the Mining and Minerals Sector did not raise new questions for the experienced artisans as they were all involved in that process in one or the other way.

5.5.2 Categories 1.1, 1.2 and 2.1, 2.2: Differences in artisan training and development

The question about differences in training and development among the engineering artisans were responded to by only indicating the different routes for mechanical and electrical artisans.

R: *“Do you think there are differences in the training and development opportunities between the Rigger Ropesman and other engineering trades such as Electricians, Fitters or Boilermakers?”*

The Artisan Development Scheme at Anglo Platinum is designed into two categories, namely the Electrical Foreman Scheme and the Mechanical Foreman Scheme. The Electricians and MC&I artisans are developed to achieve the Electrical Foreman Certificate while the Rigger Ropesman, Fitters Boilermakers and Diesel Mechanics are developed to achieve the Mechanical Foreman Certificate.

5.5.3 Categories 2.1, 2.2: Contributing factors for training and development differences

The major difference between the Rigger Ropesman and the other Engineering artisans was the spectrum of the qualifications. The Rigger Ropesman trade operates and functions in a smaller capacity than the bigger trades such as the Electricians, Fitters and Boilermakers who are more exposed to the Engineering field than the Rigger Ropesman. A recommendation will be made to the Rigger in this regard.

5.5.4 Subcategories 1.1.1 and 2.1.1: Quality of training and development

The training quality provided by the provider was complimented by the interviewees and learners complimented the learning institute. Learners had positive responses to the parallels drawn to training quality.

5.5.5 Subcategories 1.1.2, 2.1.2: Career Guidance and Themes 3, 4: Trades Development Choices

The career guidance question was:

R: "Explain if you received any career opportunity, development and guidance to become a Rigger?"

The findings based on the interviewees' responses are as follows:

Not one of the ten who were Riggers interviewed and who were employed over the last 12 years (as indicated in the Demographical questions asked. Table 4.1), were exposed to proper career guidance before they were appointed as Rigger Ropesman learners. The above undesirable trends and patterns in the company were confirmed in the responses to the question on how the learners became Riggers. Their responses clearly confirmed that it was not by their own choice but rather by influence or superior decision-making.

Recommendations will be made regarding career guidance to MQA, Anglo Platinum and future learners with reference to various engineering trades.

5.5.6 Categories 3.1 and 4.1: Earning Potential

The potential in artisan earnings was definitely not an argument as all agreed that the Rigger is not neglected or mistreated regarding remuneration or salary scales.

5.5.7 Categories 3.2 and 4.2: Rigger and other artisan numbers

The question regarding the small Rigger numbers in comparison with other trades surely raised the demand and supply issue. The understanding is that due to the low demand for Riggers, the appointment of Riggers will evidently also be lower. Rigger availability will be part of the recommendations as this will influence the demand for more Riggers. The career guidance factor was also linked to this as it may have influenced choices made by applicants during their job application interviews.

5.5.8 Subcategories 3.1.1 and 4.1.1: Rigger and other engineering trades' safety

The following question was posed to the interviewees:

R: "Would you say the dangers and risks involved in Rigging has an influence on the person's choice to become a Rigger"?

The impact of workplace safety and high risk working circumstances definitely plays a major role in the choice to become a Rigger Ropesman artisan. This is reflected in the responses of the interviewees. Recommendations to the Rigger will be made in 5.6.2.

5.5.9 Subcategories 3.1.2 and 4.1.2:

Rigger and other engineering trades' physical demands

The last question during the interviews was as follow:

R: "Do you think the physical activities and work influence the person's choice to become a Rigger"?

The physical demands of the Rigger Ropesman trade are inevitable as the nature of the tasks confirm the physical involvement of the person doing the task. It is and will always be a "hands-

on” trade as the lifting machinery, equipment and tackle must be man handled. The degree and intensity of physical demand vary as per different tasks but does not disappear at all. Again the challenges of the physicality involved in the trade are manageable as proved by the numbers of ladies involved in the trade. Recommendations regarding Rigging Plans are made in 5.6.2.

5.5.10 CONCLUSION OF FINDINGS

To conclude the findings of this study, it can be said that the concerns, challenges and recommendations justify the efforts made during the study. The future of the Rigger Ropesman trade can only be beneficial if these findings and recommendations are addressed.

The significance of the findings is demonstrated by genuine occurrence as discovered by the research done. In the findings these occurrences were quoted from the real experiences of the participants (Whisker, 2008:322)

The reliability of the findings may be illustrated in an identical way if another researcher were to carry out the same research activities with the same kind of group. If different groups of other artisan disciplines e.g. Fitters, Electricians were used the detail and knowledge of the Rigging research questions would not be reliable as the other trades do not have knowledge or experience of the Rigging trade specifics. This research was nevertheless performed authentically by the researcher and participants.

The validation of the findings was imposed by appropriate questions, approaches and techniques applied in the collecting the information and evidence. As a result, the study is able to perform realistic and fair judgments.

The recommendations for the relevant parties involved are addressed in the following section.

5.6 RECOMMENDATIONS

The recommendations will have an implication for the practice and policies regarding the recruitment, appointment, training and development of learners in the Mining and Minerals Industry (Robson, 2002:510). Changes regarding the abovementioned factors might be obligatory to ensure that the relevant processes are fulfilled in accordance with best practice and national Mining and Minerals Industry standards.

5.6.1 LEARNER RECOMMENDATIONS

The recommendations to engineering learners in the process of being appointed (especially in the mining environment) will influence their working careers. The decisions made when applying for a position must be a decision that the individual can live with and have peace with for the rest of his/her life. The consequences of accepting a job which was forced on one could be devastating for a very long period in one’s life. This decision should be made with the confidence and persuasion that it is the right job to make a career of and to become a subject matter expert in. Figure 5.2 clearly indicates the engineering career path that could be pursued. The recommendation in this regard to engineering and Rigger Ropesman learners is to make their own choice of who they want to be in the engineering field and find a company that would be willing to offer them the opportunity to train and develop in that field.

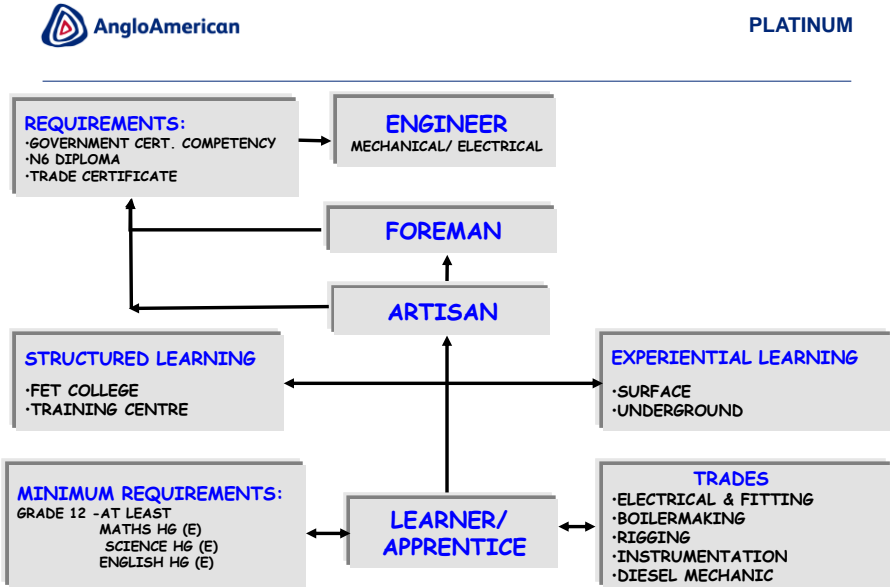


Figure 5.2 Anglo Platinum Engineering Career Paths

An important recommendation to all Rigger learners is to ensure that they do not start a task before their Safety Risk assessments have been completed and signed so that they can be authorised to perform the task.

5.6.2 RIGGER ROPESMAN RECOMMENDATIONS

The availability of Riggers on the mine is always a matter for debate in the work environment. The fact is that Rigger availability influences the demand for more Riggers. The recommendation strives to influence the working attitude mind-set of the artisan to ensure

his/her availability. The paradigm is the reality that decision-makers in the work environment must admit that they need a Rigger present when Rigging tasks are performed. The “do it yourself” paradigm is slowly but surely diminishing the demand factor for Riggers in the engineering world. This factor is further increased by the latest trend on mines to reduce the number of artisan assistance drastically. The result of this is that the artisan must perform many more basic tasks him-/herself. The recommendation to the Rigger Ropesman is not to kill this occupation but rather to revive and stimulate the need for it to the benefit of future Rigger artisans. The demand for Riggers should be stimulated and Riggers should contribute to the growth of the trade numbers in the Mining and Minerals Sector.

The next recommendation for the Rigger Ropesman is to assure his/her own development and experience in the broader field of other engineering trades. The silo job mentality will not contribute to the survival of job opportunities; neither will it enhance progression in career development. In mining terms, the recommendation is to gain experience in working in Plants, Shafts, on Winder ropes and in underground sections to ensure a full spectrum of knowledge and skills in the trade relevant tasks.

Safety Risk assessments is the last recommendation for the Rigger Ropesman. The Rigging safety risks are considered to be one of the highest risk factors in the mining industry worldwide. Anglo American substantiates this by categorising Rigging practice as one of the major Fatal Risk Standards. The recommendation includes using the Hazard Identification Risk Assessment process in conjunction with the Rigging Plan Checklist before a task is started. The safety perspective of the Rigger Ropesman trade is in the hands of the current Rigger Ropesman working on the mines at this stage. It is the Rigger Ropesman artisans who determine their safety including that of the people working with them every day.

5.6.3 SETA RECOMMENDATIONS

The contribution of this study to the MQA is unquestionably to recommend to the ETQA to set criteria for recruiting and selecting learners within engineering trades. This will eliminate the trend on mines to appoint learners in positions that are irrelevant to their trade interests and career guidance.

Recruitment and appointment processes of engineering learners should be included in the accreditation specifications. This would ensure that learners are appointed according to set criteria and not by random choice of mine officials. This recommendation will likewise influence the drafting and compilation of the WSP for the mines as it should enforce the SDF to do a proper analysis of skills required for the mine.

Career guidance by the MQA is also an essential issue to be addressed. This study indicated that FET colleges and schools were not receiving information regarding smaller trades trained and developed in the Mining and Minerals Sector via the MQA. This initiative should be accompanied and supported by the MQA with the setting up of additional financial resources to train and develop these scarce skills within the Mining and Minerals Sector.

5.6.4 EMPLOYER RECOMMENDATIONS

Recommendations to employers such as Anglo Platinum regarding career guidance are vital in that wider involvement in this regard is needed in communities where mines operate. The various engineering trades, especially the smaller trades are not promulgated and promoted effectively enough to future mine employees. The marketing of the engineering world in the mining industry therefore needs to be highlighted by mines in their immediate communities.

Learner recruitment and selection demonstrated to be a major challenge for Anglo Platinum as it was indicated to be a major flaw in the company's actual Recruitment and Selection policy. The fact that several learners stated they were told to become Rigger Ropesman applicants with total disregard to their own preference is an unacceptable practice by mine officials. This study recommends that the policies and procedures that guide this practice should be more effectively managed and executed.

5.7 RECOMMENDATION FOR FUTURE STUDIES

This study covered Rigger Ropesman trade at Anglo American Platinum with a small selected group of participants. The qualitative study assured the findings of the study to raise the awareness regarding engineering learnership recruitment and appointments. The findings in the qualitative study cannot be generalised over the complete spectrum of Rigger Ropesman or

engineering learners as the focus of the study was on participants employed by Anglo Platinum and not the full spectrum of the Mining and Minerals Sector.

Future quantitative studies with large numbers from the MQA data base will be able to focus over a much larger group with the effect of reaching high numbers of participants on more mines. The hypothesis of other trades not being exposed to proper career guidance to influence their choice of learnership could be raised and viewed with a bigger perspective.

This study did not exhaust all routes and processes, thus allowing for other studies to add on the foundation being laid by the training and development opportunity research conducted in this study.

5.8 CONCLUSION

The Rigger Ropesman trade in the Mining and Minerals Sector is and will be part of the mining sector as it contributes to the sustainability and growth of mining operations. The enrichment of the trade within the Mining and Minerals Sector will benefit the engineering working environment. This will reflect the skills and development interventions that have taken place in the mines. The development of relevant learnership skills is essential for the output of the artisan and results in the work flow instead of delays.

The mine is a catalyst not only in extracting minerals but also in developing skills. This notion is encouraged by a national approach to influence the growth of a skilled work force. The mining sector's future plans include promoting positive ideals for regions, cities, towns, and communities, which in turn paves the way to economic growth and prosperity.

The aim of this study included the promotion of the Rigger Ropesman's education, training and development environment while also emphasising the progress of the other prominent engineering trades active in the Mining and Minerals Sector. The study aspires to sway the involved parties to enhance training and development opportunities of the abovementioned engineering trades, especially those of the smaller engineering trades.

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ADDENDUM B VERBATIM INTERVIEWS

R: Good morning. Thank you for joining me for this interview. Hope you are doing well.

R: As I am communicating with you verbally, telephonically or by emails, I'm doing these interviews to gather information for my research study to enable me to complete my Masters Degree in Training and Development Field at the North West University. I would like to give you the following insurances and guarantees regarding the interview questions and answers: The principle of your participation in the research project is voluntary and that no pressure will be placed on you to take part. You as a participant may withdraw from the project at any time and may ask your data no longer to be used in the study without stating any reasons for withdrawal and without fear of any form of discrimination. I did issue an informed consent form to every participant and ensured that every participant understands the information process fully. The informed consent forms will be signed in writing before this study commences. I want to insure you that all the information of the participants will be respected. All your responses will be treated as confidential and at no time will your name be linked to your responses. I would like to start with the interview questions by asking you a few demographical questions. Is it in order with you and can we start?

I: Yes.

R: Thank you very much.

Ok, the first question is: What is your gender, for record purposes only.

I: I am a Female.

R: Female. Thank you very much.

How long are you working for Anglo Platinum?

I: 12 years .

R: 12 years. Thank you very much.

Can you explain to me what the training and development opportunities are for a Rigger Ropesman learner and artisan in Anglo Platinum and the Mining Mineral Sector?
Training and development opportunities.

I: It is the same as the other disciplines: you start by doing your learnership, you go to your phase one, you come back for your off-job training which is at the mines and when you are done, you go back to your training center, ESTC, you do your phase 4, you go

back to your off-the-job training modules and then when you are done, you go back to phase 6 and you write your trade tests.

R: Good. And after you have written trade tests, any training and development opportunities then?

I: Yes, actually, I have a lot of them. 2 years after I qualified as a Rigger, they asked me if I want to develop myself, which discipline would I feel comfortable to work with so that I can get the development, then they took me to MC&I, which is instrumentation, and I did my learnership, finished everything and I wrote my trade test, and passed, wait for 2 years again and they looked into another development, then I went to a programme, to Planned Maintenance Officers Programme, as we speak now, I am a Planned Maintenance Officer for one and a half years.

R: Ok, thank you very much. What do you think could be, and if there are any differences in the training and development opportunities between a Rigger Ropesman and other engineering trades, such as electricians, or MC&I, or boilermakers? You think there are any differences in the training and development opportunities?

I: I don't think so, because if you start with your, if you are a qualified Rigger, you are just like a qualified fitter, if you need to be a foreman, they look at the development, it is the same development, you are going to go for the same courses that a fitter goes to and then you become a foreman.

R: Ok, thank you very much.

Would you say the training and development provided for the Rigger Ropesman are of the same quality as provided to the other engineering trades in the learnership programme?

I: Yes.

R: Same?

I: Yes, it is the same.

R: Thank you very much.

Does the earning potential of the other trades have a bearing on the selection of the Rigger Ropesman?

I: Not really. The boilermaker, the fitters, and the electrician get the same, and the Riggers get the same salary excluding the instrument mechanician, but as we speak now, they are the same, the entry level is the same.

R: Ok, thank you very much. Did you receive any career opportunity development or guidance to become a Rigger Ropesman?

I: No, I had a chance to go to be a plater boilermaker, but I choose to be a Rigger.

R: Ok, thank you very much. Why would you say is there such a difference between the numbers of the Rigger Ropesman and the other similar engineering trades. Why is there a difference in numbers?

I: I think people are just scared when they see what Riggers are doing, they think it's a... I don't know, risky, or it's a... it ... you have to have power to be a Rigger, you have to be physically or a giant to be a Rigger.

R: So, you would then say that the dangers and physical activities have got a big influence in the person's choice to become a Rigger?

I: Yes.

R: Definitely.

Ok. Thank you very much. It is appreciated.

R: Good morning. Thank you for joining me for this interview. Hope you are doing well.

I: Yes sir.

R: As I communicated with you verbally, I'm doing these interviews to gather information for my research study to enable me to complete my Masters Degree in Training and Development Field at the North West University. I would like to give you the following insurances and guarantees regarding the interview questions and answers: The principle of your participation in the research project is voluntary and that no pressure will be placed on you to take part. You as a participant may withdraw from the project at any time and may ask that your data no longer be used in the study without stating any reasons for withdrawal and without fear of any form of discrimination. I did issue an informed consent form to every participant and ensured that every participant understands the information process fully. The informed consent forms will be signed in writing before the study commences. I want to ensure you that all the information of the participants will be respected. All your responses will be treated as confidential and at no time will your name be linked to your responses. I

would like to start with the interview questions by asking you a demographical question, and the first question will be:

How long are you working for the Anglo American Platinum or in the Mining Mineral Sector?
If I may ask...

I: I've been working for 5 years.

R: Thank you.

I: 5 years.

R: Also 5 years.

I: 6 years.

R: 6 years.

I: 2 years.

R: 2 years.

I: 2 years.

R: 2 years.

I: For a year

R: 1 year, thank you very much.

R: The next question that I want to ask is: can you explain to me what the training and development opportunities are for a Rigger Ropesman learner and an artisan in the mining and mineral sector or at your mine – the training and development opportunities?

I: We have courses we attend.

R: Courses that you attend.

I: It's where we go to the training centre and do our modules and criterion test.

R: Ok, thank you. Next one.

I: I came on our operation and do the on-jobs with the trainers about what we learned at the ESTC.

R: Ok, that's good.

I: It's where we got to have 4 subjects that are required as a learner.

R: Ok, anybody else?

I: We also have phase tests.

R: Phase tests.

I: Trade tests.

R: Trade test at the end. Yes.

Ok, thank you. So the next question:

Do you think there are differences in the training and development opportunities between the Rigger Ropesman and other engineering trades with the examples of electricians, or fitters or boilermakers. Do you think there is a difference in the training and development opportunities between artisans and learners?

I: No, I think there is no difference because we get, we are doing the same phase tests and we are writing the same trade tests. Ya.

R: Ok.

I: I say Yes and No.

R: You say yes and no. Ok. Can you explain to us why.

I: Let's take for an electrician. There is, I think there is more danger to him compared to a Rigging, compared to a Rigging. Electricians, they do more fault finding,

R: Ok.

I: We just do a job with seeing and expecting and assuming that we need this and this.

R: Ok.

I: I think there is no difference.

R: No difference. Ok.

I: I think there's no difference, because at the end of the day we are going to write the same trade test from MQA.

R: Ok.

I: I also think there is no difference, even the time we spend, we spend the same time, this other...

- R: Same time spend at the training centers. Ya. Ok, thank you very much.
Why do you think is there differences? The ones that you think that there is differences, why do you think that there would be differences between the training of a Rigger and the training of an electrician for example? What causes those differences?
- I: Technology.
- R: Technology. Yes, that's a good answer. Anybody else?
- I: Responsibilities.
- R: Responsibilities. Yes, that's also a very good answer.
- Ok, let's go to the next question.
Would you say the training and development provided for the Rigger Ropesman are of equal quality as the training provided to the other similar engineering trades that we talked about? The training, do you think the quality is the same, or is there a difference in the quality of training between the different artisan or learners.
- I: They are not the same.
- R: Not the same?
- I: Not the same. The other, it is just that other trades they get more courses than Rigging, but the quality is the same.
- R: So you feel the quality is the same, but the number of training modules and courses are different. Ok. Anybody else?
Ok, thank you.
Em, do you think that the earning potential, the salary scales, of the other trades have a bearing on the selection of the Rigger Ropesman? Do you think that the salary scales, there is a difference and that more people become other trades than Riggers because of salaries?
- I: I think the salary is the same, it is just that people they do not understand Rigging, so they don't go to Rigging, but the salary is the same.
- R: Ok, thank you very much.
- I: I think others they are afraid of Rigging, only because we work much time than the other trades, and maybe it is because we are getting more money because of the overtimes and things like that.
- R: Ok. So you say that the time spend at work for a Rigger is more than the time spend by the other trades, and that causes a difference, but it is not a negative influence on the way that people select to become Riggers.

I: And again it is because according to the HR recruitment, they will find, they will see whether they are in short of Riggers and electricians.

R: Ok. The recruitment process.

I: Ya.

R: Ok.

Ok then, em, did you receive any career opportunity and development and guidance to become a Rigger? Did they tell you beforehand what a Rigger does or what a fitter does or what a electrician does and that's why you decided to become a Rigger?

I: I didn't get any training about Rigging but as I was working in the operation for 5 years, I used to see how the Riggers were doing their jobs and the electricians and all the other trades.

R: Ok. Thank you.

I: I wasn't exposed to Rigging. I saw Rigging at the ESTC.

R: Ok. No exposure.

I: No exposure.

R: Ok.

I: I didn't get any information about Rigging.

R: Ok, no information before Rigging purposes.

I: I also never know the trade called the Rigging, I heard of any engineering until I found out when they told me I am going to be a Rigger.

R: They told you, you are going to be a Rigger?

I: Yes.

R: Ok.

I: I've never heard of what is Rigging before, but I knew it only on mining when I just joined mining, so I learned to know what is Rigging.

R: Ok.

I: I knew all about other things like electricians, boilermakers and all that stuff.

R: Ok. Ok, thank you very much.

Then, the next question: how did you decide to become the Rigger learner?

I: Eeh, I applied for a learnership and then I didn't decide that I wanted to go to a Rigger, but I applied for a learnership so they decided that I must go to Rigging. But as I was saying, that I saw Rigging at my operation, so I decided no, it is good, I will take Rigging.

R: Ok. So you were exposed beforehand, and that make you decide on that.

I: Yes.

When you apply for learnership, there's more people rushing for electricians and fitting and the other, so in Rigging, there is less competition.

R: O, ok. So you did it for a job opportunity.

I: Yes, for the job. And development opportunities.

R: Ok.

I: For me, it's like, I wanted to know more about it, so that's why I decided on Rigging.

R: O ok.

Ok, thank you.

I: I saw the learnership, then I applied for that learnership and then actually I didn't want to be a Rigger but because of the score that I've got on the learnership, they decided to put me on the Rigging and I ended up enjoying it and continuing it.

R: Ok, thank you.

I: I applied for a learnership, so my supervisor chose for me to be a Rigger.

R: So the supervisor decided that you must become a Rigger?

I: Yes. I applied and did the assignment, then they submitted us to our trade according to those assignment. So the high score was for Rigging, so I went for Rigging.

R: Oh, according to the aptitude testing?

I: Yes.

R: Ok, thank you.

Ok, then, ehm, why would you say is there such a big difference between the numbers of the Rigger Ropesman learners and other similar engineering trades, if you look at the quantities?

I: I think it is only because, like, when comparing to the other trades, they get more information about other trades than about Rigging, because most of us didn't get information about Rigging.

R: Ok.

I: I also think it is because people they think that Rigging is difficult, it is a difficult job, they don't know, they don't have that knowledge that Rigging is not difficult. If you work with it in a right way, everything is simple and easy.

R: Ok.

I: Just mainly they see that there is not too much jobs available to many people in that field.

R: Ok.

I: And then, on FET Colleges, we've got less information about Rigging only because the electricians and other fitters and boilermakers, that's why most of the guys they go to other trades.

R: Other trades ya.

I: Yes.

R: At FET colleges for presentations?

Ok. Thank you. And then, would you say the dangers and risks involved in Rigging have an influence on the person's choice to become a Rigger?

I: No.

R: No?

I: No.

Yes. I would say yes.

R: Yes?

I: Because sometimes other people are afraid of working at heights.

R: Ok?

I: And they think if ever I become a Rigger then I would be going up there and what if ... then...

R: Ya, ya. Ok

I: I would say yes because a lot of people are afraid of working with heavy stuff.

R: Ok, heavy stuff.

I: Heavy stuff, they all want to work with fine things.

R: Oh, ok.

I: I think no, because each and every trade it has its dangers, like working with electricity is very dangerous. So I think every trade has its dangers, like boilermaking, they are in danger because of they are using gasses.

R: Ya ya.

I: So, it is dangerous.

To what they said, most of us are not exposed to Rigging, so I cannot say that because of the physically things and challenges, we don't know what is happening at Rigging until we see Rigging.

R: Ok.

Ok, then. The last question: Do you think the physical activities and work influence the person's choice to become a Rigger?

I: Ya, because, let's say, they have been working in the mine as an assistant, maybe I'm working in the process as an operator, so I saw some Riggers are working, then I would say that they are working hard and I would say, NO, I don't want to become a Rigger, so that's why I say...

R: Ok.

I: I think even the equipment Riggers they are using, people they are scared of them, like chain blocks, they think chain blocks, it is not easy to work with the chain block, but they don't know if you are using it in the right way and using the right size of a chain block, that will make your work easier.

R: Ok.

Ok, thank you very much for contributing to this interview. It is much appreciated and once the project is completed, you will be given feedback on it. Thank you very much.

I: Thank you.

Thank you, Sir.

R: Good afternoon. Thank you for joining me for this interview. Hope you are doing well.

R: As communicated with you verbally and telephonically, I'm doing these interviews to gather information for my research study to enable me to complete my Masters Degree in Training and Development Field at the North West University. I would like to give you the following insurance and guarantees regarding the interview questions and answers: The principle of your participation in the research project is voluntary and that no pressure will be placed on you to take part. You as participant may withdraw from the project at any time and may ask that your data no longer be used in the study without stating any reasons for withdrawal and without fear of any form of discrimination. I did issue an informed consent form to every participant and ensured that every participant understands the information process fully. The informed consent forms will be signed in writing before the study commences. I want to insure you that all the information of the participants will be respected. All your responses will be treated as confidential and at no time will your name be linked to your responses. I would like to start with the interview questions by asking you a few demographical questions. Is it in order with you and can we start?

I: More than welcome, Martin.

R: Thank you.

Ok, the first question is: what is your gender, for record purposes.

I: I am a male.

R: Male. Thank you.

How long are you working for Anglo Platinum in the mining mineral sector?

I: For 17 years now.

R: Ok. Thank you.

Can you explain to me what the training and development opportunities are for a Rigger Ropesman learner and artisan in Anglo Platinum and the Mining Mineral Sector?

I: While you are a learner, there are opportunities for training at the training centres, but as soon as you are a qualified artisan, the opportunities became less because of the work demand.

R: Ok. Thank you. Do you think there are differences in the training and development opportunities between the Rigger Ropesman and other engineering trades, such as electricians, fitters and boilermakers?

I: No, not at all.

R: Ok, thank you.

What do you think are the contributing factors to these differences? So, there are no differences, so there won't be contributing factors?

I: Yes.

R: Would you say the training and development provided for the Rigger Ropesman are of equal quality as provided to the other similar engineering trades in the learnership process?

I: Mmm, yes, it is the same quality.

R: Ok. Thank you.

Does the earning potential of the other trades have a bearing on the selection of the Rigger Ropesman?

I: Please repeat the question again.

The earning potential of the other trades, does it have a negative impact on the selection of the Rigger Ropesman?

I: No, I don't think so.

R: Ok. How did you become a Rigger Ropesman?

I: Well, I was selected by the Manage Engineer. He explained to me what a Rigger is and that there is no other opportunities to go for electrician or fitter and that he can help me with a Rigger Ropesman apprenticeship, and he explained to me what it is and I was interested.

R: Ok. There was no other career guidance given to you with regards to other trades?

I: Eh, not at all.

R: Ok. Why would you say is there such a difference between the numbers of the Rigger Ropesman and the other similar engineering trades?

I: It all depend on the section we work, if we are at the conveyer section or pump station section, the demand for the fitters and electricians is higher, and ... ya well ... if you work on the shafts, also the ropes that you need to maintain, also require actually 1 Rigger per shaft and maybe 2 electricians and 2 fitters and 2 boilermakers due to the fact of the maintenance.

R: Ok. Thank you very much.

Would you say the dangers and risks involved in Rigging have an influence on the person's choice to become a Rigger?

I: Yes. Yes, working at heights is one of the areas, danger areas.

R: Ok.

Do you think the physical activities and work of a Rigger, influence a person's choice to become a Rigger?

I: Absolutely yes.

R: Ok, thank you very much.

R: Good afternoon. Thank you for joining me for this interview. Hope you are doing well.

I: Yes sir.

R: As I communicated with you verbally, I'm doing these interviews to gather information for my research study to enable me to complete in Development Field at North West University. I would like to give you the following insurances and guarantees regarding the interview questions and answers: The principle of your participation in the research project is voluntary and that no pressure will be placed on you to take part. You as a participant may withdraw from the project at any time and may ask your data no longer be used in the study without stating any reasons for withdrawal and without fear of any form of discrimination. I did issue an informed consent form to you and ensured that every participant understands the information process fully. The informed consent forms will be signed in writing before the study commences. I want to ensure you that all the information of all participants will be respected. All your responses will be treated as confidential and at no time will your name be linked to your responses. I would like to start with the interview questions by asking you a few demographical questions. Is it in order with you and can we start?

I: We can start.

R: Thank you. Ok. The first questions is, What is your gender? for record purposes only.

I: I'm a male.

R: How long are you working for Anglo American Platinum?

I: For 7 years now.

R: Thank you.

Can you explain to me what the opportunities are for a Rigger Ropesman learner and artisan in Anglo American Platinum?

I: You start with Rigger Ropesman and then you go through on the job training and then do the job at ESTC Randfontein and then you qualify as a Rigger Ropesman artisan then you work as an artisan for some years and then you enrol for foremen certification skill and then you go through the training development for you to do all your technical courses and managerial courses and thereafter you qualify as a Mechanical Foreman.

R: Thank you very much.

Would you say the training and development provided for the Rigger Ropesman are of equal quality to similar engineering trades?

I: Yes, I can say it is similar, because there is MQA ISO who regulates all the training, so the training quality will be equal.

R: Thank you very much. Does the earning potential have a bearing on the selection of the Rigger Ropesman?

I: No, I don't think so, because between them there is no differences.

R: Ok, thank you. Did you receive any career opportunity, development or guidance to become a Rigger Ropesman?

I: No, I haven't receive that one, I was just told that they only have Rigger Ropesman position, you take it or you leave it.

R: Ok. Thank you very much.

Why would you say is there such a big difference in numbers of Rigger Ropesman and d the other trades like fitters, boilermakers and electricians?

I: Because there is no career guide for people about Rigging, for these people they don't know what is Rigging or Rigger Ropesman, so they don't have much info on the trade itself.

R: Thank you very much.

Would you say the dangers and risks involved in Rigging have an influence on a person's choice to become a Rigger?

I: Ya, for some individuals, they look at the way the Riggers are working, doing such dangerous work, for some people, yes it is not that big challenge for them.

R: Thank you. Do you think the physical activities of the Rigger Ropesman can influence the person's choice to decide to become a Rigger Ropesman – the physical activities?

I: Yes, when you are already in the field, there is chances that people might be afraid of choosing to become a Rigger Ropesman, because they look at how the Riggers are working, but for other people, they don't know what is Rigging, so they won't decide whether they want to become Rigger or not, because they don't have much info.

R: Thank you very much for your contribution in the interview. It is much appreciated.

I: Ok, thank you Sir.

R: Ok. Good morning. Thank you for joining me for this interview. Hope you are doing well.

I: Morning and I'm doing well thanks.

R: As I communicated with you verbally, I'm doing these interviews to gather information for my research study to enable me to complete my Master Degree in Training and Development Field at the North West University. I would like to give you the following insurance and guarantees regarding the interview questions and answers: The principle of your participation in the research project is voluntary and no pressure will be placed on you to partake. You as participant may withdraw from the project at any time and may ask that your data no longer be used in the study without stating any reasons for withdrawal and without fear of any form of discrimination. I did issue an informed consent form to you and ensured that every participant understands the information process fully. The informed consent form will be signed and has been signed by yourself before this study commenced. I want to insure you that all the information of the participants will be respected. All your responses will be treated as confidential and at no time your name will be linked to your responses. I would like to start with the

interview questions by asking you a few demographical questions. Is it in order with you and can we start?

I: Yes.

R: Thank you

Ok, the first question is: What is your gender, for record purposes only

I: Female

R: Female, Thank you very much.

How long are you working for Anglo American Platinum?

I: I'm 12 years now.

R: 12 years. Thank you

Can you explain to me what the training and development opportunities are for a Rigger Ropesman learner and artisan in Anglo American Platinum?

I: Ehm, I was a Rigger Ropesman learner for 3 years and then qualified as a Rigger Ropesman artisan, worked for a Rigger Ropesman artisan for 5 years and now I am in the progress of being a mechanical foreman.

R: Ok, thank you very much

Do you think there are differences in the training and development opportunities between the Rigger Ropesman and other engineering trades such as electricians, fitters and boilermakers

I: No, they are the same

R: Good morning. Thank you for joining me for this interview. Hope you are doing well.

I: I'm doing well, thanks.

R: As I communicated with you verbally and by email, I'm doing these interviews to gather information for my research study to enable me to complete my Masters Degree in Training and Development Field at North West University. I would like to give you the following insurances and guarantees regarding the interview questions and answers: The principle of your participation in the research project is voluntary and that no pressure will be placed on you to take part. You as a participant may withdraw from the project at any time and may ask that your data no longer be used in the study without

stating any reasons for withdrawal and you don't have to fear for any form of discrimination. I did issue an informed consent form to every participant and ensured that every participant understands the information process fully. The informed consent forms will be signed in writing before the study commences. I want to ensure you that all the information of participants will be respected. All your responses will be treated as confidential and at no time will your name be linked to your responses. I would like to start with the interview questions by asking you a few demographical questions. Is it in order with you and can we start?

I: Aaa, it is in order. We can start. I'm happy.

R: Ok. The first question is: What is your gender? For record purposes only.

I: I'm the male.

R: Thank you.

How long are you working for Anglo American Platinum in the Minerals Mining Sector?

I: I'm working 33 years.

R: Thank you very much.

Can you explain to me what the training and development opportunities are for a Rigger Ropesman learner and artisan in Anglo Platinum and Mining Minerals Sector?

I: Eeh, the training is very good for both all the trades.

R: Thank you very much.

Do you think there are difference in the training development opportunities between the Rigger Ropesman and other engineering trades such as electricians, fitters and boilermakers?

I: No the trainings is for both is brilliant, for all the trades it is exactly the same.

R: Ok thank you, and for the artisans?

I: For the artisans, the training serial for short courses is less than for electricians and boilermaker, to train the people.

R: Ok thank you. What do you think are the contributing factor for these differences? Why is there a difference in artisan development than for Riggers?

I: Eeh, electricians and your artisans, boilermakers and fitters got the broader field than Riggers. Riggers is normally only for ropes and to uplift and move the stuff, for where

artisans has a broader field, so you got your knowledge to apply to the standards you need.

R: Ok. Thank you very much.

Would you say the training development provided for the Rigger Ropesman is of the equal quality as provided to the other similar engineering trades?

I: Yes, it is equal qualities – the same.

R: Ok thank you.

Does the earning potential of the other trades have a bearing on the selection of the Rigger Ropesman – the earning potential...?

I: No, the earnings is exactly the same. The Rigger and artisans and electricians are exactly the same.

R: Ok, thank you very much.

Do you provide any career opportunity development or guidance for learners to become a Rigger Ropesman?

I: Yes, I provide that for them because at this stage the ratio for on the mine – you need more electricians and more fitters and more boilermakers according to the Rigger. To give you an example, for the Rigger you need one Rigger for per shaft to do the slinging and all that work where you need ten electricians, so the job opportunities there is much more than for Riggers, and ya, that is the reason for...

R: So do you say that there is a big difference in numbers between Riggers and other trades?

I: Yes, there is a big difference. The numbers for Riggers is much smaller than for other trades.

R: Ok thank you. Would you say the dangers and risks involved in Rigging have an influence on the persons choice to become a Rigger?

I: Yes, you find different kinds of Riggers, Riggers who are working at heights, not everyone is happy with working at heights. Eeh... slinging all the cages, lots of people depends on the slinging of on the splicing of the Rigger, so the difficult part and the danger part for Rigger that you must take responsibility, is much higher, eeh.. and a Rigger is direct responsible for that people and some people don't what that – to take that responsibility.

R: Good, thank you very much. Then the last question: Do you think physical activities and work influence the person's choice to become a Rigger?

I: Ya, of course yes. Because a Rigger must do splicing with spikes and that stuff, eeh ...you don't work with small spanners, so the people must have got a little bit of power to do splicing and all that stuff, so it cannot be a thin guy so it must be ...all that stuff, that it iy... really the person must have got the power to do Rigging work.

R: Ok, thank you very much for the time spending with me. Thank you for the answers from the interview. You will be given feedback when the project is completed.

I: Ag, that's fine Martin. But feel free to ask some more questions if something ditch up there and you want some more information about the Riggers, feel free to contact me. I 'm at my office. Thanks a lot.

R: Thank you very much.

ADDENDUM C INFORMED CONCENT FORM

Informed Consent for Research Project

Date: _____

This document is to provide you, the potential participant, with more information on the research project.

1. Title of the Project:

Training and development opportunities for the Rigger Ropesman artisan in the Mining and Minerals Industry.

2. Institution:

North West University - Faculty of Education Sciences

3. Name and contact details of the researcher:

Martin HS Pieters

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4. Details of the research supervisor:

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Tel: 018-299-4740 (Int. +27182994740) Fax: 018-299-4740 (Int. +27182994740)

5. The purpose/ aim of the project:

The purpose of the study is to:

- investigate what factors influence the training and development ratio of Rigger Ropesman learners to be different from similar engineering trades
- determine what causes the difference.

6. What will be expected of you as participant:

The interventions that will involve your participation will include:

- Semi-structured individual interviews with the identified participants
- Qualitative data will be collected through individual, semi-structured interviews with:
 - HRD Managers,
 - Learnership Coordinators,
 - MQA and MERSETA Chief Operating Officers
 - One Focus Group interview consisting of six Rigger Ropesman Learners at ESTC.
- All the interviews will be audio recorded and verbatim typed for data analysis.

7. What precautions were taken to protect you the participant?

- Participants will be individually interviewed in their specific workplace environment to ensure comfort and welfare of the participants.
- The privacy of the participant will not be violated as the focus of the interview will be training of learners orientated and not impact on the performance of the interviewee.
- The Focus group interview will be with anonymous learners based on a sampling group of 15 learners of which the first 6 equal numbers will be interviewed.

8. How will the findings of the project be made available?

In the end a summary report will be compiled that will be available to all participants for future interventions and reference regarding artisan ratios.

I..... agree to voluntary participate in this research project and acknowledge that it was done without strain and demands sited on me to partake in this project.

Signed:

Date: