A thesis submitted in fulfilment of the requirements for the degree of Doctor in Business Administration

Strategies to reduce the emigration of Engineering Professionals in the South African Petroleum Refining Industry

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DECLARATION

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Signed: Ntsikelelo Sipho Ngonyoza

Date: 08 February 2023

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- My friend HTT who supported and encouraged me.

ABSTRACT

The South African refining companies have been losing experienced engineers, due to emigration, which has negatively impacted the refinery Operations. This study aimed to explore the factors that affect the emigration of engineers working in the South African petroleum refining industry. The study used a mixed method approach combining qualitative and quantitative research techniques using structured, in-depth interviews and an electronic survey questionnaire. The study participants were refinery engineers with a formal engineering diploma or degree from a recognized University or University of Technology. The findings revealed that more than half of the engineers had a positive emigration potential and were actively applying for jobs overseas (56% for interviews and 52% for the surveys). The preferred emigration destinations were the Middle East and Europe for a duration of 5 years. The engineers were Millennials, aged between 31-36 years with 5-15 years' work experience. The emigration drivers were a rapidly deteriorating macroeconomic climate resulting in a higher cost of living and unhappiness at work due to poor career advancement, poor work-life balance, and a perceived inaccurate and unreliable performance appraisal system where promotions and recognition awards were affected by manager bias. Some recommendations were to have clear career progression paths incorporating job redesign strategies, reduce appraiser bias in the performance appraisal process, incorporate appraisee feedback, and review company benefits to ensure they meet the work-life balance needs of a changing workforce. The study has contributed to the body knowledge by developing a method to measure the emigration potential of petrochemical refining engineers and plot it on an emigration potential matrix. As well as to better understand the critical factors that lead to a positive emigration potential and propose strategies to reduce it by implementing the developed emigration potential reduction framework.

Keywords: Emigration Potential, Matrix, Career Progression, Work-Life Balance, Bias, Favouritism

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LIST OF ACRONYMS AND ABBREVIATIONS

ANOVA - Analysis of Variance

CPI - Consumer Price Index

CV - Curriculum Vitae

CTL - Coal to Liquid

EP - Emigration Potential

EAP - Employee Assistance Program

GTL - Gas to Liquid

LNG - Liquified Natural Gas

MTPA - Million Tons Per Year

NERSA - National Energy Regulator of South Africa

PA - Performance Appraisal

SMART - Short, Measurable, Achievable, Realistic, Timebound

SARB - South African Reserve Bank

QWL - Quality of Work Life

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CHAPTER 1: STUDY INTRODUCTION AND OVERVIEW

1.1 Introduction

International migration is not a new phenomenon, in fact, existing migration data dating back to the 19th century when European migrated to the to the New World (Elsner, 2015). The world has however moved to an age of rapid globalisation and freedom of movement, which has increased international migration, global security, and adversely affected climate change across the whole world (Żółnowska, 2020; Castles and Miller, 2009 as cited in Weeks, 2012).

Emigration is a move towards a country that offers a more comfortable position whether the main driver is a better income, better healthcare, better weather, or a safer environment (Ullah and Haque, 2020).The consequence of increased emigration has been that of developing countries losing their skilled labour to developed countries, since the early 1960s. The rate of emigration of South African engineering professionals in the petroleum refining industry is widely believed to be high, even though statistics are available due to unreliable data, poor record keeping and because Statistics South Africa (Stats SA) only started gathering migration data from the 2016 Community Survey where a sample of 1.3 million households were surveyed. The emigration of highly skilled South African professionals is not a new phenomenon. It has however become more common which has resulted in a high loss of investment due to the expenses incurred for the education and training and education of these professionals (Ince, 2020; Statistics South Africa – as cited in Swart, 2009; Mittner - as cited in Eagar, 2008).

1.2 Study Overview

Chapter 1 gives an introduction of the study by giving the background to the study explaining the research gap, motivation, and problem statement for the study. The problem statement, which this study seeks to resolve, is that South African refineries are facing a brain drain and fuel security challenges partly due to the reducing refining capacity caused by poor reliability of these aging assets which has resulted in mechanical integrity incidents, for example fires, and explosions which have led to unplanned long-term shutdowns at Engen and Astron Energy refineries.

Chapter 2 covers an in-depth literature review of a range of topics such as immigration, management theory, work environment and motivation. The chapter will also put in place the theoretical context to address the research questions focusing on the neo classical economic theory, push and pull factor theory, Adam's Equity Theory, Hertzberg's two-factor theory, and Maslow's Hierarchy of needs theory among others.

Chapter 3 covers the research methodology, research philosophy research design methods used by this study. A mixed-method approach combining interviews and electronic surveys (Basias and Pollalis, 2018; Dadhe, 2016). While both the qualitative and quantitative methods were used, it is important to note that this research study leaned more towards the qualitative side (Basias and Pollalis, 2018; Johnson and Waterfield, 2004; Creswell, 2003). The study's research design conforms to the UKZN ethics requirements and is assigned the protocol number HSS/1774/016D by the ethics committee.

Chapter 4 analysed the collected data from the interviews using thematic analysis and coding to enable descriptive statistic. The study findings from the interviews revealed an extremely high emigration potential among the engineers with 56% of the engineers actively applying for jobs overseas, mostly to the Middle East. The engineers with the highest Emigration Potential were 31-36 years of age with their main drivers for emigration being a combination of an unhappy work environment and rapidly decline macro-economic environment which is reducing their disposable income due to high inflation. Even though inflation was a concern, most of the interviewed engineers (59%) were happy with their current salaries. Some of the items of engineer dissatisfaction were found to be: (1) Company benefits offered little practical value to their day-to-day lives. (2) A lack of clear career progression. (3) Perceived manager bias and favouritism in the workplace experienced

Chapter 5 analysed the quantitative survey results to determine the emigration potential of refining engineers. To quantify the emigration potential of the engineer, the responses from the survey questionnaires were processed, analysed, and assigned an emigration potential score using a product of their individual planning and connectivity scores. The EP score was measured against the migration potential matrix developed by the researcher in Figure 5.2. The emigration potential analysis revealed that 52% of the engineers had a positive emigration potential, meaning that more than half of the surveyed engineers were actively applying for jobs overseas, with Middle East as their most preferred location, as indicated by 40% of the engineers.

The demographics of the engineers showed the dominating age range with the highest emigration potential engineers between 31-35 years of age with 5-10 years' work experience. A notable observation is that most of respondents in the very high EP subcategory, said a 15-25% salary increase was a sufficient trigger to emigrate, which is not a substantial increase for unearthing one's life and moving to a new country. The ANOVA F-test and T-test results for the pull and push factors for the EP various EP groups analysed confirmed that the differences in the means are not statistically significant.

In terms of the work environment, the positive findings were that the working relationship between the engineers and their colleagues and managers was shown to be good. The negative revelations from the survey questionnaire was that the engineers had a negative outlook about their career advancement, while the analysis of the job specific factors showed that they experienced overstress and a lack of appreciation and recognition.

Chapter 6 interrelated and compared the findings from interviews and the survey questionnaire discussed in Chapter 4 and chapter 5 respectively. Chapter showed good relatedness between findings emanating from the interviews those emanating from the survey questionnaire. The main similarities were the high number of positive EP engineers with the approaches showing more the half (56% for interviews and 52% for the surveys) of the engineers were actively applying for jobs located outside of South Africa. The top destination for both the data sets compared was the Middle East, with Europe as the 2nd most referred destination. The nature of emigration was mostly short term between 3 to 5 years. The demographics of the positive emigration engineers showed: The age range between 31-36 years had the highest emigration potential with an experience level of 5-15 years.

The first critical factor that influenced the decision to emigrated was a lack of career progression, particularly for participants who were in the same role for approximately 5 years or more and had developed feelings of stagnation and poor job challenge. The second critical factor was perceived favouritism in the performance management process where, promotions, recognition awards being reserved for cliques. The third critical factor was a lack of work life balance. This was primarily due to employees reporting to line managers with little relevant field experience which resulted in work overload, short deadlines, limited resources, and time. 61% of the survey respondents believed job challenge was more important than a higher salary abroad.

Chapter 7 presented the study findings in relation to the research questions and main objectives of the study. This chapter starts by determining the emigration potential of the interviewees and the survey participants and ends by discussing the proposing strategies refining companies can use to reduce the emigration potential of their engineers. Emigration related aspects such as the desired length of emigration, the preferred region and the demographic of the high EP group are also presented. The demographics of the positive emigration potential engineers is explored in terms of age range, the experience level, and qualifications. This chapter also discusses the critical factors in the workplace like career growth, relations with colleagues and managers, and their general views and experiences of the work environment.

Chapter 8 presented the study recommendations, the limitations of the study, the areas of future work, implications of the study and highlighted the contribution to the body of knowledge. The study recommendations are to: (1) Have clear career progression paths and to use job redesign strategies to prevent feelings of career stagnation. (2) Reduce appraiser bias and subjectivity in performance appraisal process and incorporating appraisee feedback once the PA process. Also, to investigate and apply methods reduce or eliminate bias from the performance review process, and to appoint experienced line managers and strengthen SMART goal setting (3) Provide relevant employee benefits of a dynamically changing workforce like flexible work hours to improve work-life balance. (4) Reduce hiring bias and hire more female engineers who had a lower emigration potential.

The study has contributed revealing the high emigration potential of South African refinery engineers and potential brain drain facing this industry. The study contributes by providing a tool to quantify and evaluate the emigration potential using a five-by-five matrix that can be used to measure emigrations potential of respondents. Furthermore, this study also proposed and presented an interventions framework emanating from the study findings to reduce the emigration potential.

1.2.1 Background of Study

The developed first-world countries and regions like Canada, Australia, New Zealand, Great Britain as well as oil rich Middle East countries are viewed as the preferred destinations for these highly skilled professionals (Statistics South Africa Community Survey, 2016; Wakefield, 2015). The growth and diversification projects by Middle East petroleum refining companies has resulted in a high demand for experienced and skilled human resources.

The world has severe technical experience and skills shortages creating competitive environment for acquiring talent, and South Africa’s petroleum refining industry is not immune to this global competition for talent. The Middle East region plans to tender 615 oil and gas projects between 2021 and 2025. Most of these projects, 395, will be downstream projects covering refining of crude oil into gasoline, diesel, and other fuels (83 refinery projects) and petrochemical complexes which produce olefins like ethylene and propylene as well as aromatics like Benzene, Paraxylene and Toluene (312 petrochemical projects). The planned upstreaming projects, 77, will cover raw crude oil and natural gas exploration and production while 143 projects will be midstream covering thee processing, storage and transportation of LNG, oil, and natural gas (Methane).

South Africa’s neighbouring country, Mozambique has recently discovered 100 trillion cubic feet offshore gas reserves making it a big new player in the global gas industry (McKenzie and Ghazi Balkiz, 2022; Abiq, 2021). Mozambique shipped its first liquefied natural gas (LNG) cargo from the Corul Sul Floating LNG (FLNG) facility to Europe in November 2022. Total Energies’ and Mozambique LNG are planning a to start a $20 billion, 2.8- million tons per year (mtpa), project in the North of Mozambique in 2022.

With the first shipment targeted to reach Europe in January 2023, Europe will become increasingly independent from Russian gas whilst Mozambique's economy transforms into an industrialized economy which inevitably will require an influx of foreign skills' (Hollands, 2022). With an increase of skilled South African's engineers emigrating, the emigration potential of the remaining skilled petrochemical engineers needs to be understood. It is only when the main drivers for them wanting to stay or leave South Africa are well understood, that effective retention strategies can be developed to improve the retention of these critical skills ensure that the South African petrochemical industry remains globally competitive.

1.2.2 Significance of Research Study

Contribution of Research

Research plays an essential role the economic development and growth of a country, whilst contributing to societal progress in various areas like education and health. Research is therefore an important indicator of future growth and development of a country's economy (Rao, 2014). Universities now have research centres that strongly focus on industry funded research topics to find solutions to problems faced by industry and society. For example, the research studies contributed to identifying mental health as an important issue facing society during the COVDI-19 pandemic (Jubaer et al., 2021).

Signification of this Study

The brain drain and loss of critical tacit knowledge, expertise and experience leads to a loss of efficiency, that will ultimately compromise the organisational performance and profitability of the South African petrochemical refineries (Guilding, Lamminaki and Mcmanus – as cited in Deri, Zaazi and Bazaanah, 2021; De Long, 2002). As it is still unclear what the actual emigration potential is among South African engineers working in the Petrochemical sector, and what the reasons are for engineers wanting to leave South Africa to work abroad. Refining companies have largely believed the reason for the engineer exodus to be solely due to higher earning abroad. This research study closes that gap by determining the emigration potential of the refining industry engineers, and unearthing the most significant factors that determine whether they want to stay or leave. Furthermore, the study proposes strategies to reduce the emigration of engineering professionals in the South African petroleum refining industry, to ensure the long-term survival and global competitiveness of this vital sector.

1.3 Research Gap and Motivation for Study

Prior to the Stats SA 2016 community survey which sampled 1.3 million households, migration studies had not been conducted by Statistics South Africa. This means that emigration was invisible as no comprehensive emigration statistics were available prior to 2016 (Statistics South Africa Community Survey, 2016; Wakefield, 2015). Invisible migration is where migrants leave without following formal migration processes to record their departure, which makes obtaining quality statistics and subsequent research challenging (Ullah and Haque, 2020). Consequently, the South African petrochemical industry therefore has no industry specific emigration statistics and is therefore unable to gauge the extent of the current or potential risk of brain drain and threat to their operations due to the emigration of engineering professionals.

1.5 Problem Statement

South Africa faces a severe shortage of engineers with several established companies having to complete for engineering talent which is in short supply while simultaneously losing the few available engineers to emigration. Developed countries like Australia and the Netherlands currently have emigration programs which encourage South African engineering professionals to apply with the option to extend and potentially obtain residency and citizenship. (Fraser, 2023; Ridout, 2022; New World Immigration, n.d). With insufficient emigration available for analysis, and free movement contributing to invisible emigration, refining companies cannot quantify the potential brain drain due to emigration. Without the emigration statistics, the demographic analysis of the emigrating engineers cannot be done, and the reason(s) for them wanting to emigrate are not known. Without this valuable information, refining companies are unable to mitigate against this brain drain threat due to emigration. The research questions and research objectives of this study were developed to close this gap.

South Africa's six petrochemical refineries provide various products, for example petrol, diesel, liquified petroleum gas bitumen, jet fuel etc. to the nation. While they supply 18% of South Africa's primary energy and add 8.5% to the gross domestic product, they are facing an uncertain future due to poor reliability and a widespread loss of experienced engineers who poses critical skills and knowledge (SAPIA, 2021). This loss of tacit knowledge negatively impacts refining companies the following ways: (1) It increases the likelihood of equipment failures which result in unplanned shut downs which impacts revenue and profits. (2) Increases the probability of health and safety incidents and accidents, for example, the recent fatal explosion and a fire at the refineries owned by Glencore Plc and Petroliam Nasional Bhd respectively, which make up 43% of the country's oil-refining capacity, have resulted in unpanned lengthily shutdowns (Burkhardt, 2021). This has increasing South Africa's reliance on imports to meeting the national fuel demand. Furthermore, the future of South Africa's downstream is uncertain due to the national clean fuels legislation which will require large investments to upgrade the refinery equipment in or to produce fuels with a lower Sulphur content by 2027.

With the announcement of the Petroliam Nasional Bhd Engen refinery shutting down permanently in 2023 and converting it into fuel storage terminal, the sale of the SAPREF Refinery joint venture between Royal Dutch Shell Plc and BP Plc and the review of Sasol's Natref refinery has made the need for emigration reducing interventions critical to ensure safe, profitable operation of South African refineries (Burkhardt, 2021; Roelf, 2021).

1.6 Focus of Study

The study focused on evaluating the emigration potential of engineers currently working in the South African Petrochemical Refinery industry. It explored the critical factors like demographics, salary, work environment, organisational leadership, and culture to understand how and to the extent to which they have influenced the engineers with a positive emigration potential to look for work opportunities abroad. It also explored the main barriers that prevented the emigration of the engineers. The survey done for the study focused on engineers at all levels from form junior employees to engineering management, while the interviews focused on employees with 5 years working experience in the petrochemical refinery industry. The research objectives and questions are below.

1.7 Overall Research Aim

The emigration of engineers working in the refining industry has believed to be high, even though the extent to which is currently happening is unknown due invisible emigration and absence of credible data. The primary drivers for the emigration are not understood and the potential threat of brain not quantifiable. The overall aim of this research is to measure the current emigration potential of the engineers currently working in South Africa’s refining industry to help evaluate the brain drain threat, and to develop strategies to reduce the emigration of experienced engineers. The research objectives and research questions are discussed below.

1.7.1 Research Objectives

The main objectives of this study were to:

Objective 1: Determine the emigration potential of current engineering professionals in the South African petrochemical industry.
Objective 2: Explore the demographic characteristics of the engineers who want to emigrate.
Objective 3: Identify the main factors contributing to current employees wanting to emigrate
Objective 4: Propose strategies to reduce emigration of engineering professionals in the South African petroleum refining industry.
Objective 5: Propose hiring strategies that can be used to ensure a higher retention rate of future staff.

1.7.2 Research Questions

The key research questions that needed to be answered by this study are below:

Question 1: What is the current emigration potential amongst engineering professionals in the South African Petroleum sector?

Question 2: What are the demographic characteristics of the personnel who intend to emigrate?

Question 3: What are the critical factors that determine whether the employees will stay or leave?

Question 4: What strategies can be employed to reduce the emigration potential of current staff?

Question 5: What hiring strategies can be used to ensure a higher retention rate/lower emigration potential of future staff?

1.9 Research Framework

The research framework showed In Figure 1.1 used to study the emigration potential of the engineering professionals combined international migration theories i.e., push and pull factors theory, the neo classical economic theory and theories that pertain to work environment and motivation. For example,, Adams' Equity Theory, Maslow's Hierarchy Theory, Hertzberg's two-factor theory and Work Redesign etc.

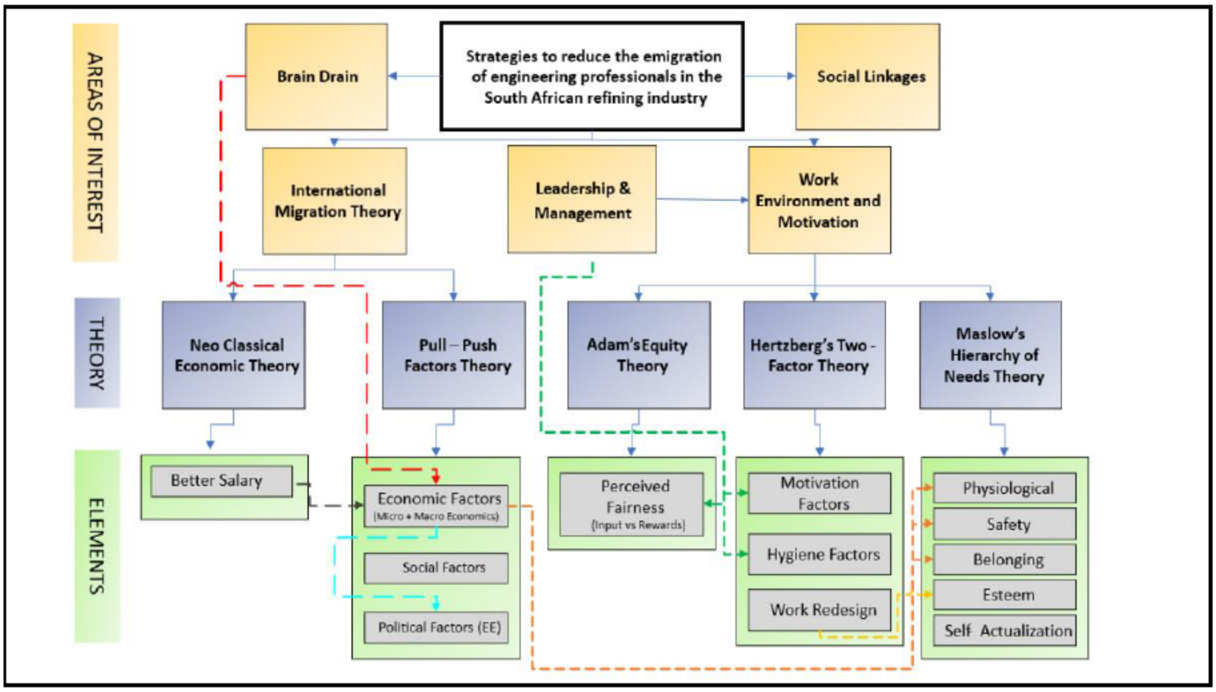


Figure 1.1: Research framework for this study (Source: Author)

1.10 Research Design and Approach

The importance of the research design cannot be understated because, it forms the foundation of the entire research as it has a significant influence on the reliability of the research conducted (Kothari, 2004).

1.10.1 Research Philosophy

The Critical Realism research philosophy investigates the status quo and to understand the underlying reasons and relationships of the status quo (Saunders and Tosey, 2013). The critical realist philosophy was used to understand the extent of the potential skills loss by measuring the emigration potential of current staff. The underlying reasons for emigration potential has been examined using the work environment and motivation. For example, Adams' Equity Theory, Maslow's Hierarchy Theory, Hertzberg's two-factor theory and Work Redesign.

1.10.2 Research Approach

Creswell and Creswell (2018, p.40) define research approach as the plans and procedures to be used that cover all aspects of the research from the vaguest assumptions to the most detailed procedure to be used for data collection, analysis, and reporting. The three research approaches broadly used are the Qualitative research approach, the quantitative research approach, and the mixed method research approach.

Bhandari (2022) defines qualitative research as an approach that involves collecting and analysis of data that is in the form of audio, text, or video to better understand behaviour, feelings, thoughts, views, or opinions of participants. Quantitative data can be collected using a single or a combination of techniques, for example interviews, focus group discussions, survey questionnaires using open ended questions and observation. McLeod (2018) and Bhandari (2022) write that some of the downsides of qualitative research are:

- A general difficulty for findings to be generalised or replicated due to the researcher subjectivity in the data analysis and interpretation steps.
- The data collection, coding and analysis can be time consuming and labour intensive.

The quantitative research approach utilises statistical techniques to test theories pertaining to the behaviours and attitudes that people have, and for testing relationships between different variables. This approach enables researchers to explore patterns in the data using descriptive statistics or through hypothesis testing using sophisticated statistics software. Findings can be generalized to apply to the wider population if the sample size is large enough (Bhandari, 2022; Creswell and Creswell, 2018; Coghlan and Brydon-Miller, 2014). The downside to quantitative research is that the respondents may not be completely honest and lie, when completing the questionnaires because, they may not want to answer questions that are personal or sensitive in nature or may want to create a reality that is different from their circumstances. For example, they may want to appear richer and more successful to build their self-concept (Hahgani et al., 2021; DeLamater, 2016).

The mixed methods research approach combines the qualitative and quantitative research approaches. This integration of research approaches usually gives a more comprehensive picture of the topic under study because it uses multiple data collection and data analysis procedures to gain deeper insights that help to solve the research problem and answer the research questions with greater credibility. Some of the drawbacks of the mixed method approach is the high workload due the use of multiple data collection methods and subsequent analysis of each collected data set using different techniques. This approach can also cause a confliction in the results making it difficult for the researcher to decide, or to know, how best to proceed with the study to completion (Bhandari, 2022; George, 2021; Creswell and Creswell, 2018).

For this study which focuses on the threat of brain drain to the petroleum refining industry, a mixed method approach was used to yield more credible results (Creswell, 2018; Saunders et al., 2009; Johnson, Onwuegbuzie, and Turner, 2007).

1.10.3 Triangulation Types

This study used methodological triangulation to strengthen the research and improve the credibility and validity of the research findings Methodological triangulation uses two or more data collection methods. For example, interviews, questionnaires as used in this study (Noble and Heale, 2019; Carter, Bryant-Lukosius, DiCenso, Blythe and Neville, 2014). Creswell, and Plano Clark (as cited in Čížek, 2009) describe four triangulation implementation models. This study will use a combination two of the four models i.e., the data transformation and convergence model triangulation implementation models.

Data transformation model: This triangulation implementation model, shown in Figure 1.2, analyses the qualitative data and quantitative data separately. The qualitative data is then transformed into quantitative data and thereafter the two quantitative data sets are compared prior to performing the data interpretation step (Polit and Beck, 2018; Ackermann 2017).

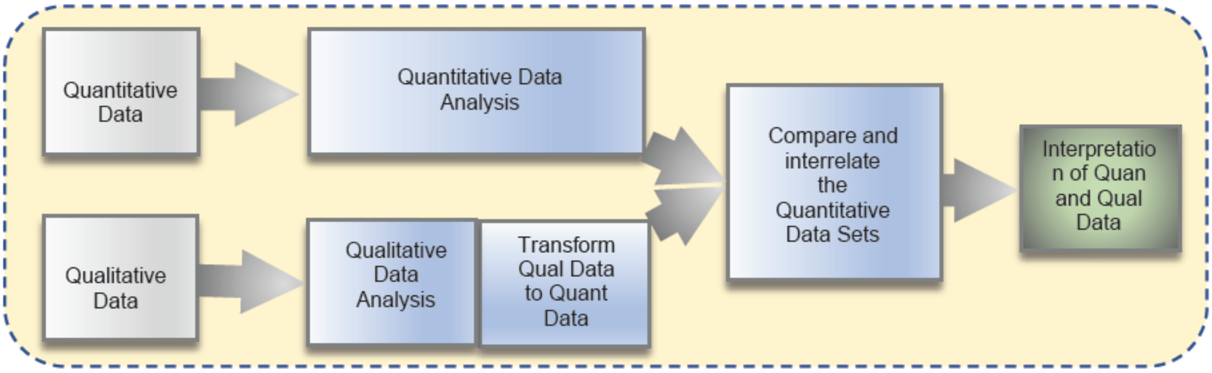


Figure 1.2: Data Transformation Triangulation Design (Creswell n.d. p63 - as cited in Ackermann, 2017)

(i) **Convergence model:** In this model, shown in Figure 1.3, data is collected using two different methods which are analysed separately, for example, qualitative interviews and quantitative survey questionnaires. The results from the data analysis are then integrated and converged through comparison during the data interpretation stage (Polit and Beck, 2018; Direko and Davhana-Maselesele, 2017)

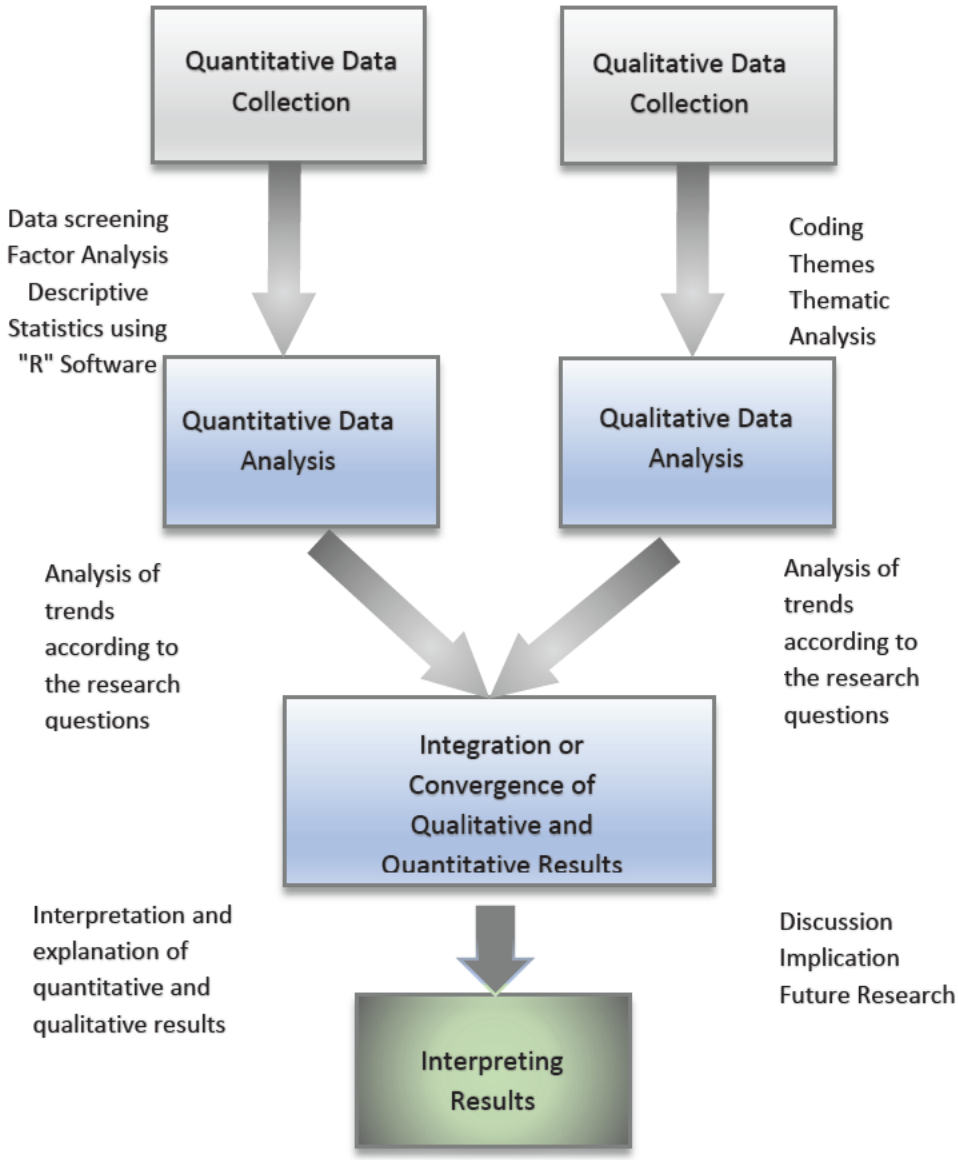


Figure 1.3: Mixed method data analysis process using concurrent triangulation strategy adapted for this study (Basias and Pollalis – as cited in Nzeru, 2020; Creswell, 2009; Creswell and Plano Clark, 2007; Ivankova, Creswell and Stick, 2006)

1.10.4 The Sample

Sampling was used by selecting some of the elements in the population to draw conclusions about the entire population (Rao, 2014; Cooper and Schindler,2014, p.336). Participants were those who hold a formal engineering diploma or degree from a recognized University or University of Technology, working in technical roles such as engineers, technologists, and technicians, in the South African petroleum refining industry. The sample size for the interviews was 25 participants. According to a study by Guest, Bunce, and Johnson (2006) the minimum sample size required for qualitative research using interviews is 12, to ensure that sufficient data saturation and theoretical saturation are achieved (Guest, Bunce, and Johnson - as cited in Onwuegbuzie and Collins, 2007). The researcher analysed 87 completed quantitative survey questionnaires. The questionnaire surveys were used to make analytic generalisations and not statistical generalisations.

1.10.5 Data Collection Instruments

Primary Data

The qualitative data is this research was collected through questionnaires/surveys based on well-structured multiple Likert scale questionnaires and qualitative data was collected through structured interviews (Saunders, 2009).

Secondary Data:

Secondary data from previous research in migration, government reports, web articles and websites and official statistics were also used (Swart, 2009).

1.10.6 Data analysis and Methods

The study used mixed method approach where the data qualitative and quantitative data were analysed separately, interpreted, and brought together to reach balanced conclusions. The collected data underwent quality check to determine response errors and unanswered questions, which resulted in the 121 received questionnaires being reduced to 87 complete questionnaires analysed in the study. Manual thematic analysis was used to analyse the data obtained from the interviews. Thematic analysis involved the identification, analysis, coding, categorizing, analysing of the data, reporting and accurately interpreting patterns (Saldana, 2009; Braun and Clarke, 2006; Kothari, 2004).

1.10.7 Validity, Reliability and Trustworthiness of the Study

Internal validity is the extent to which the research outcome truthfully represents a research subject and therefore deals with the accurate of data collection (Khawaja, Haim, and Dileep, 2012; Saunders, Lewis, and Thornhill, 2009). External validity is about the ability of the researcher to generalise the research by making make analytic generalisations and case to case transfers (Saunders et al., 2009; Miles & Huberman, 1994, cited in Onwuegbuzie and Collins, 2007). Reliability is about consistency in data collection which will result in consistent findings when the research is conducted by a different researcher or on a different sample (Saunders, Lewis, and Thornhill, 2009; Kothari, 2004). Trustworthiness or rigor in research can be defined as the to the extent to which confidence in the data collection, data analysis methods and interpretation established and maintained to ensure that the findings from the study are truthful and credible. (Polit and Beck, 2018; Direko and Davhana-Maselesele, 2017; Connelly 2016).

1.10.8 Bias

Bias can threaten the study's trustworthiness and validity and significantly skew the research findings through errors in inference and or misinterpretation. Bias can be present during the Participant Selection, Data Collection and Data Analysis phases of research. While bias cannot always be eliminated, it is important to minimize it in every level of research where it can be present in the form of the researcher's background, and cultural views, participant selection bias, and flawed data collection methods. Bias is independent of sample size and statistical analysis and can cause estimates of association to be greater or smaller than the true association (Polit and Becker, 2018; Creswell, 2014; Smith and Noble, 2014; Pannucci and Wilkins, 2010).

1.10.9 Ethical considerations:

Research ethics defined as set of rules that govern human behaviour, while ethics applied in research are an extension of those rules to guide researchers on how to conduct research. It is the appropriateness of the researcher's behaviour in relation to the rights of the participants in the study and those affected by it. For this study, a strict ethical code was followed as required by the University of KwaZulu-Natal ethical code and, code of conduct. Ethical clearance was granted against study code HSS/1774/016D (Wagle, 2020; Cooper and Schindler, 2014; Saunders, 2009).

1.11 Chapter Summary:

The rate of emigration of South African engineering professionals in the petroleum refining industry is widely believed to be high even though statistics, due to unreliable data and poor record keeping, are not available. The world's severe technical skills shortages have created a competitive environment for acquiring talent, creating a potential risk of brain drain that threatens refinery operations and profitability. This research study closes that gap by unearthing the most significant underlying factors that determine if engineers want to stay or leave, which inadvertently impacts organisational attrition rates. Furthermore, it proposes strategies to reduce the emigration of engineering professionals in the South African petroleum refining industry, supporting the long-term stable operation and profitability.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The previous Chapter 1 introduced the research and a brief description of the research study. After giving an overview of the study, the problem statement, research gap and significance of the study were described. This was followed by a briefly discussion of the processes and procedures to be followed in this study to answer the research questions and achieve the objectives of the study.

This Chapter, 2, executes an in-depth review of existing literature to provide the theoretical content to answer the research questions and meeting the objectives of this study introduced in section 1.7. This chapter is structured to cover the various areas identified discussed in the study framework presented in section 1.9. The literature was also used to refine the and clarify the problem statement and provide the author with sufficient knowledge to enable accurate and detailed contextualisation the findings emanating from this study by linking them to the existing, well-developed theories, for example, (1) The neoclassical economic theory that look at the increased salary as the primary motivator for emigration to a new country. (2) The Push and Pull factor theory that looks at the social, economic, and political factors in the sending country and receiving country as drivers for emigration. (3) Various theories pertaining to work environment, and motivation, for example the Adam's Equity theory that look at the importance of justice and fairness in the workplace, Vrooms expectancy theory that explored the relationship between motivation and anticipated reward through incentives schemes in the workplace among others.

2.2 Literature Review

2.2.1 Overview of South Africa's Petroleum Refining Industry

South Africa has 6 petroleum refining companies that supply fuel to the country, 4 of which are crude oil refineries and the remaining 2 are synthetic fuel refineries i.e., coal to liquid (CTL) and gas to liquid (GTL) which employ the Fischer-Tropsch process to convert a Syngas, a mixture of Carbon Monoxide and Hydrogen, into liquid hydrocarbons (SAPIA, 2021). The CTL and GTL refineries are owned by Sasol and

PetroSA respectively, while Shell & BP, Sasol, Astron Energy and Engen own the crude oil refineries. It is important to note that currently three of the four crude oil refineries owned by Shell & BP, Engen and Astron Energy are currently not operational, as of January 2023, due to recent flooding caused by torrential rain at the Shel & BP refinery and explosions which resulted in major asset damage at the Engen and Astron Energy refineries, shutting them down and reducing South Africa's refining capacity and further increasing the countries 60% reliance on imported fuel products (Govender, 2022; Reuters, 2021).

2.2.2 Emigration

2.2.2.1 International Migration

The world has moved to an age of globalisation, which has increased international migration, global security, and adversely affected climate change across the whole world (Żółnowska 2020; Castles and Miller, 2009 cited in Weeks 2012). Emigration can be defined as the act of leaving the borders of one's country, for a short time or permanent basis, to take residence in a new country where you were not born (Ince 2020; Han, 2017). Simply put, migrants are therefore people who were born in a different country and/or are citizens of a different country to that of their current residence (UN DESA, 2019; Scruton, 1982). With travel between countries being more now than ever before, the word has become a global village allowing workers to take up employment outside of their countries, border due to a lack of opportunities, instability, and insecurity in the home countries (Babar et al., 2018). The net effect of easier global travel means that migrants are more likely to up emerging work opportunities in the global labour market because they are more responsive than natives to these changes in the labour market that result that result in work opportunities (Guzi, 2018).

According to the United Nations (2019), an estimated 272 million international migrants live abroad worldwide which is an increase from the estimated 214 million in 2009 and the 244 million in 2016, with the number worldwide the migrants in 2019 accounting for 3.5% of the world's population and the fastest growing population group (Ullah and Haque 2020; UN DESA 1019; Jana and Ivan, 2009; United Nations

Population Division, 2009 - cited in Weeks 2012). More recently developing countries have been losing their skilled labour to developed countries, through migration, since the early 1960s (Topkaya, 2015). Ullah and Haque (2020), Topkaya (2015) and Jana and Ivan (2009) further state that countries that have high skills shortages attract skilled labour from countries abroad by offering lucrative incentives and immigration programmes. Broadly speaking, a skilled employee can be defined as person who has undergone education and training through a recognised institution of higher learning. A skilled labour force forms the core of many major organisations because, they utilise their specialized skills to grow their organisations and the economy (Mattes and Richmond, 2000; Mattes and Mniki, 2004). Without a concerted effort to motivate and retain skilled workers whilst attracting new skilled workers, quality in the core organisational functions will be compromised (EMN 2017, IOTA Consultancy Services 2001 - cited in Wamundila 2008).

The COVID-19 pandemic has resulted in unprecedented extended lockdowns which has greatly affected migrant workers, who generally are the most vulnerable to job losses during this pandemic. The skilled migrant workers are offered better protection from job losses through pandemic policy responses, while the unskilled migrant workers are often left with little social protection because, they are usually not included in these policy responses. Some of the policy responses include wage subsidies, temporary unemployment benefits and subsidized COVID-19 testing, for example (Akman et al., 2020). It is important to note that during the COVID-19 pandemic, affected countries like Brazil, Saud Arabia, Portugal, New Zealand, and Malaysia had various interventions for migrant workers which ranged from wage subsidies and treating migrant workers as permanent residents to ensure access to free health screening and health checks (ILO Monitor 2020 - as cited in Akman et al., 2020).

2.2.2.2 Engineering Profession Shortage in South Africa

With a chronic shortage of engineers, workforce planning has become a critical aspect of business sustainability. South Africa has a low tertiary educated working age population between 25-64 years of age, of below 10%, when compared globally to other countries. According to Figure 2.1 only China has a less tertiary educated population than South Africa with Russia having the highest number of 52% (Statistics

South Africa – cited in LMPI, 2016). Japan who ranks third highest behind Canada and Russia, had approximately 3306 engineers per million citizens which much higher when compared to South Africa's 473 engineers per million citizens (Lawless 2005 – cited in du Toit and Roodt, 2008).

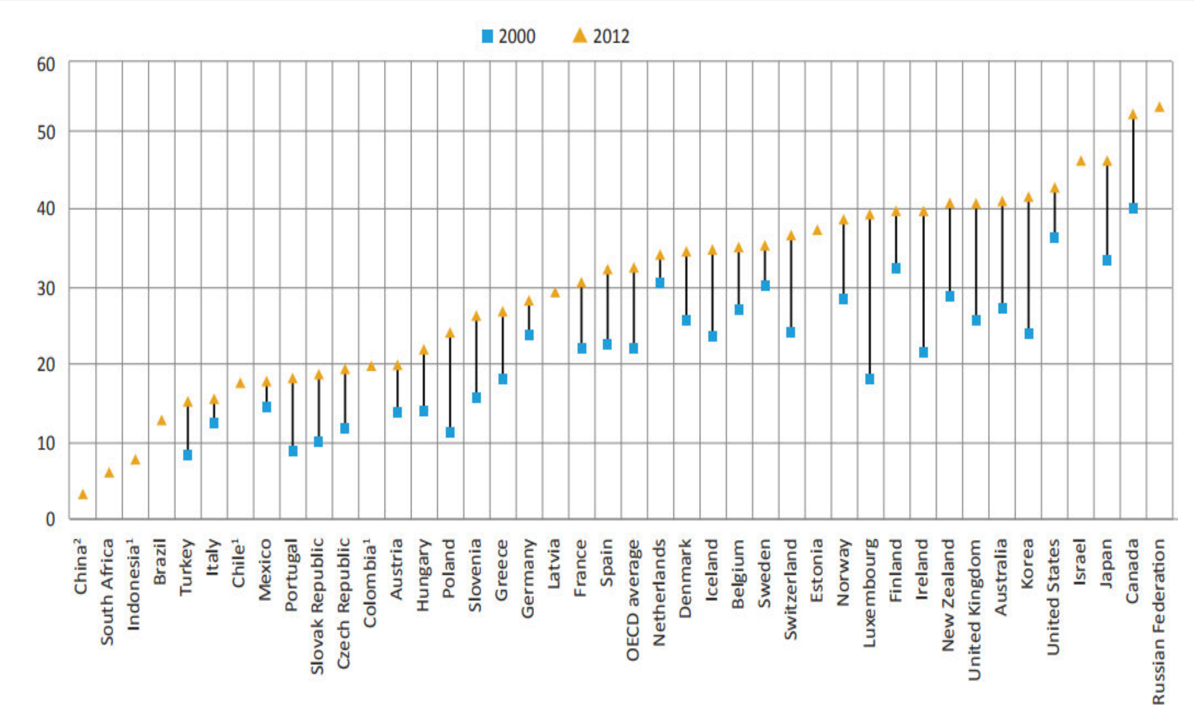


Figure 2.1: Comparative statistics of tertiary educated 25 to 64-year-olds in different countries (LPID 2016)

The work of du Toit and Roodt (2008) further states that South Africa's shortage of engineering professionals, which is one of these worst scarce skills, is caused a shortage of matriculants who meet the entry requirements to study engineering at tertiary institutions as well as competition from other lucrative career fields like accounting, finance, and economics. As shown in Figure 2.2 South Africa produced a little more than 2000 engineers which is below the number of engineering graduates that Japan produces as aforementioned.

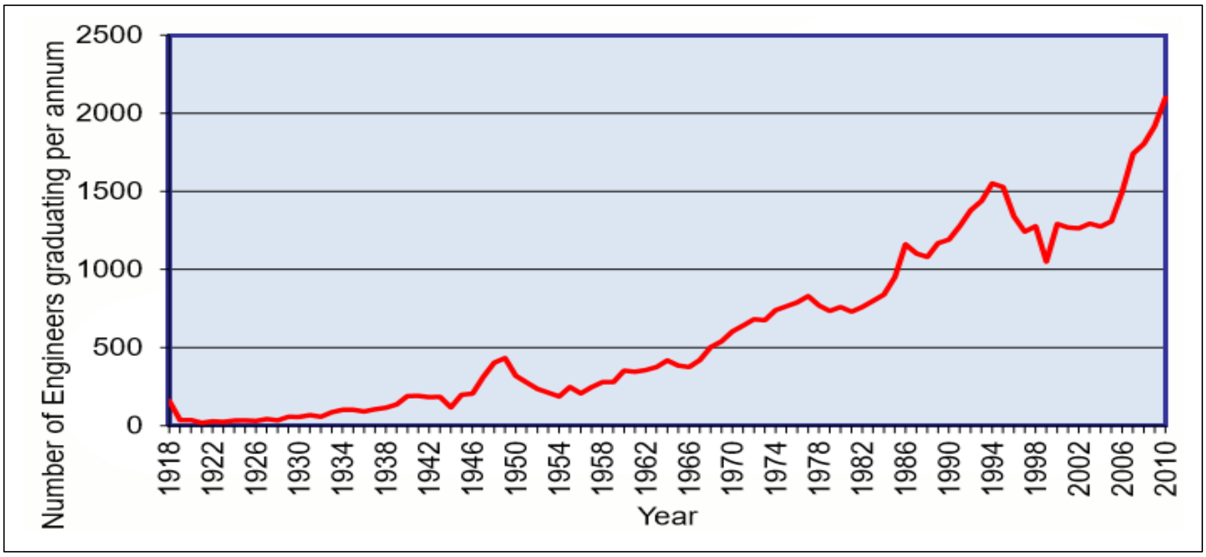


Figure 2.2: Graduation trend of South African Engineers between 1918 and 2010 (Lawless 2013)

The petrochemical refining industry faces an uncertain future due to the South African governments clean fuel legislation intended to reduce Sulphur emissions from 2027, which will require the six refiners to invest $3.9 billion in the required equipment upgrades. The upgrade requirements could force the South African refining firms to showdown indefinitely without a financial support mechanism (Burkhardt 2022; Reuters 2021).

2.2.2.3 Emigration in South Africa

Invisible migration where migrants leave without following formal migration processes to record their departure makes obtaining quality statistics and subsequent research challenging (Ullah and Haque, 2020). It therefore goes without saying that, without industry specific emigration statistics for its industry, the Petrochemical industry is unable to quantify the extent of the current or potential brain drain and threat to their operations due to the emigration of engineering professionals. Prior to the Stats SA 2016 community survey which sampled 1.3 million households, migration studies had not been conducted by Statistics South Africa meaning no comprehensive emigration statistics were available (Statistics South Africa Community Survey, 2016; Wakefield, 2015).

Previous research on the South African skills migration in the medical and research and development (R&D) professions showed the preferred emigration destinations for South Africans to be the developed countries like; Australia, the United Kingdom, Canada, the United States and New Zealand (Crush et al, 2014; Khan, Blankley, Maharajh, Pogue, Reddy, Cele and du Toit, 2004). The number of South Africans emigrating to developed countries is higher than the global averages. International migration trends show that in 2019, 56% of migrants lived in in developed countries, while the remaining 44% lived in less developed countries (UN DECSA, 2019), while migration trends for South African professionals showed that seventy five percent (75%) migrated to developed countries in 1999 with a further increase to 83.9% in 2016 as shown in Figure 2.1 (Stats SA Community Survey, 2016; Kaplan, Meyer, and Brown, 1999). The developed countries in Figure 2.3 include Australia, Germany, United Kingdom, United States of America, and Canada, whilst the less developed countries are the United Arab Amirates, China, Cuba, and American Samoa.

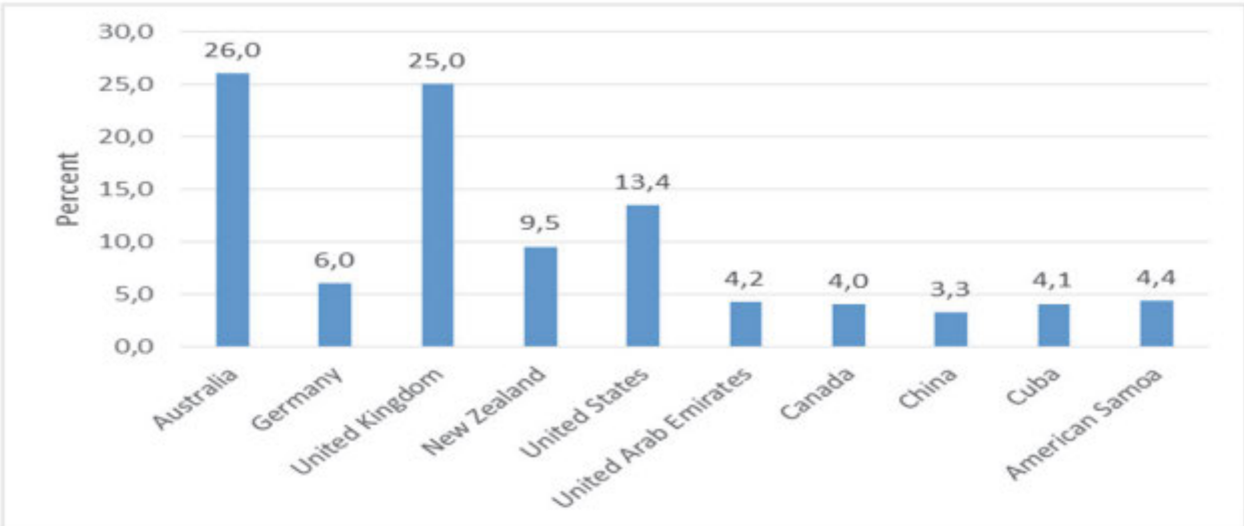


Figure 2.3: Top ten overseas destinations for South African emigrants (Stats SA Community Survey, 2016)

The emigration trend between 2006 and 2016, taken from the Stats SA community survey (2016), is shown in Figure 2.4. Figure 2.4 shows that emigration has been gradually increasing since 2011 with a sharp increase in 2015. What is alarming about Figure 2.4 is that 25.7 percent of the South Africans who emigrated between 2006 and 2016 did so in 2015 which coincides with period of political and economic instability and dissatisfaction with former President Jacob Zuma's presidential term, which is discussed in detail under the Political factors section of the literature review. The trends migration trends past 2016 will only be known at after the next community survey.

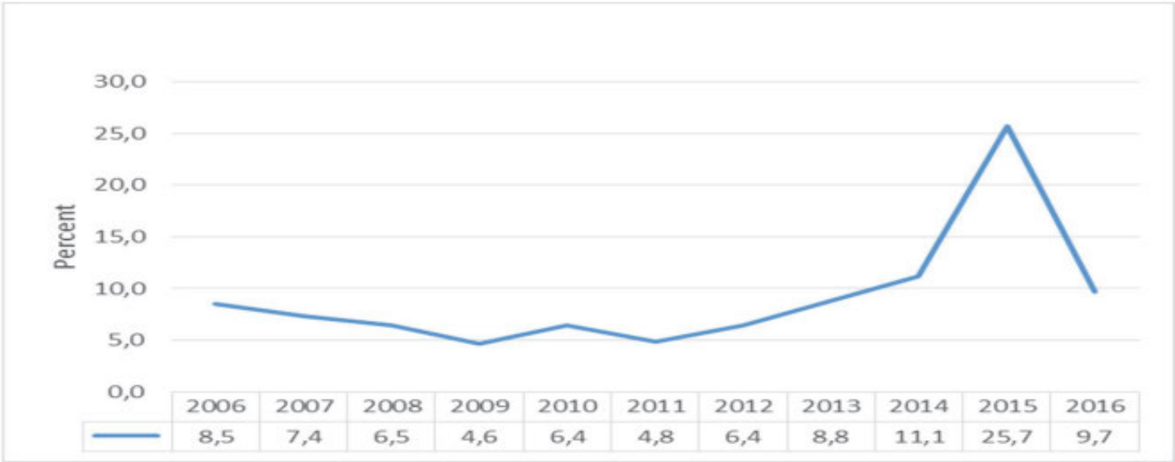


Figure 2.4: Trend of South African emigrants between 2006 and 2016 (Stats SA Community Survey, 2016)

2.2.2.3(a) Working Age

In many societies globally, the young adults are the age group with the highest propensity to migrate due to them being their productive and reproductive prime in addition to the age and life-cycle changes that affect most humans in various societies (Cao and Han, 2019;Acheampong - as cited in Assan and Kharisma, 2019; Weeks 2012). Research conducted by Bastianon (as cited in Okičić, 2019) on youth migration in Georgia and Moldova showed that the decision to migrate was done at an individual level, motivated by personal aspirations and capabilities, while household aspirations did not play a major role in the decision to emigrate. This individualized approach to migration of the youth is more consistent with the neoclassical economic theory, than the household economic theory.

The age-related migration phenomena have very strong links with the "law" of migration (Tobler 1995, cited in Weeks 2012). One of the fundamental concepts in demography is the age-structure of the population which is normally in the form of an age pyramid. The advent of globalisation has resulted in the age-structure of migration to become an equally important concept which can be describable with a multiexponential model migration schedule (Rogers, 2009). Earlier work shows the multiexponential model migration schedule to have main families that demonstrate the regularities found in age patterns of migration i.e., standard, elderly retirement peak, elderly post-retirement upslope and post-retirement upslope Standard (Raymer and Rogers, 2006). Figure 2.5a-d shows these main families of the multiexponential model migration schedule indicating the migration peaks, upslope and downslope age patterns caused by life course events. The work of Cao and Han (2019), Okičić (2019) and Weeks (2012) on youth migration showed a similar migration peak between the ages of 24 to 39 were consistent with the standard migration peak of the multiexponential model by Raymer and Rogers (2006) in Figure 2.5a. The age patterns in Figure 2.5a-d exhibit similar peaks i.e., during infancy, during the early years of labour force participation and at retirement. As this study aims to understand the develop strategies that reduce the emigration potential of engineers, the main of interest is therefore the labour force migration upslope, peak and downslope between the ages of 20-60.

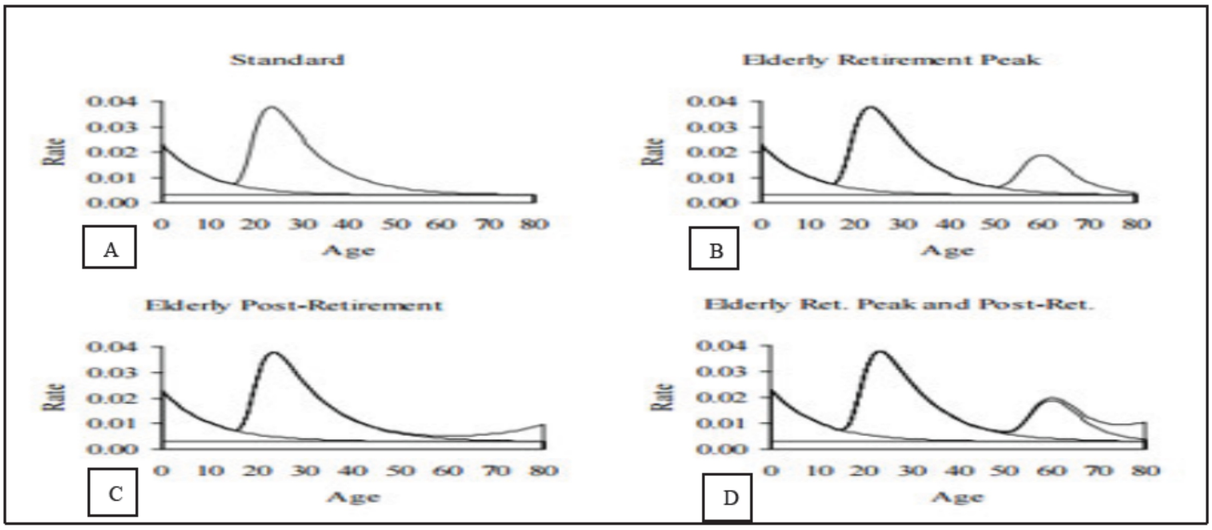
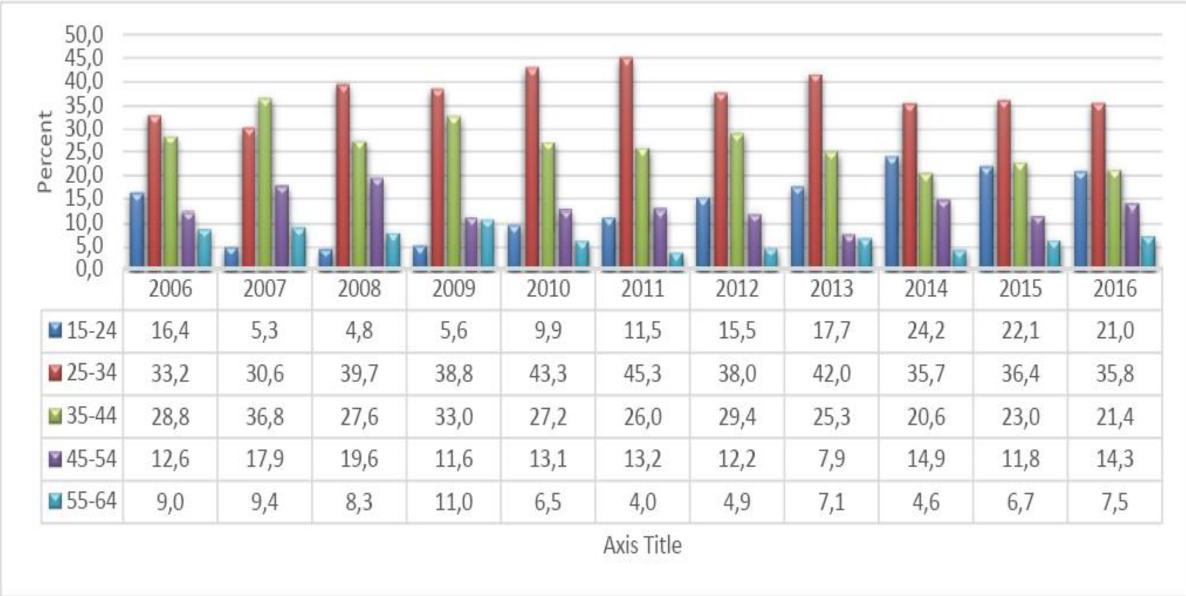


Figure 2.5a-d: The main families of multiexponential model migration schedules (Raymer and Rogers, 2006)

Analysis of South African emigration data from the Statistics SA community survey (2016) also shows close agreement with the multiexponential model migration schedules explained in the work of Raymer and Rogers (2006). South African emigration data, shown in Figure 2.6, shows that the 25-34 working age group has mostly experienced the highest rate of emigration between 2006 and 2016, with 2007 being the only year where the 25-34 age group was placed second behind the 35-44 age group with regards to total number or percentage of emigrants. The 25-34 age group has accounted for 30-45% of all emigrants between 2006-2016. The second highest working age group is the 35-44 years' group which accounted for approximately 7-20% of the total emigrants between the same period i.e., 2006 – 2016 (Statistics SA community survey, 2016).



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15-24	16,4	5,3	4,8	5,6	9,9	11,5	15,5	17,7	24,2	22,1	21,0
25-34	33,2	30,6	39,7	38,8	43,3	45,3	38,0	42,0	35,7	36,4	35,8
35-44	28,8	36,8	27,6	33,0	27,2	26,0	29,4	25,3	20,6	23,0	21,4
45-54	12,6	17,9	19,6	11,6	13,1	13,2	12,2	7,9	14,9	11,8	14,3
55-64	9,0	9,4	8,3	11,0	6,5	4,0	4,9	7,1	4,6	6,7	7,5

Figure 2.6: Working age of South African Emigrants between 2006 and 2016 (Stats SA Community Survey, 2016)

2.2.2.3(b) Gender

The Statistic SA community survey (2016) shows that more males, as compared to females, emigrated between 2006 and 2016. This is shown in Figure 2.7 where 54% of the emigrants were male and 46% of the emigrants were female (Statistics South Africa Community Survey, 2016). The bar chart, in Figure 2.7, showing a difference in gender distribution by gender is consistent with the global gender migration trends published by the UN, where 52% of the emigrants were male and 48% were female. The traditional societies where the status of women is lower as in the cases of sub-Saharan Africa, North Africa and Western Asia had less women emigrating as compared to the regions of the world where women enjoy a more equal status with men, like in Europe, North America, Latin America, and the Caribbean (UN DESCA, 2019; United Nations Population Division 2009 – cited in Weeks, 2012).

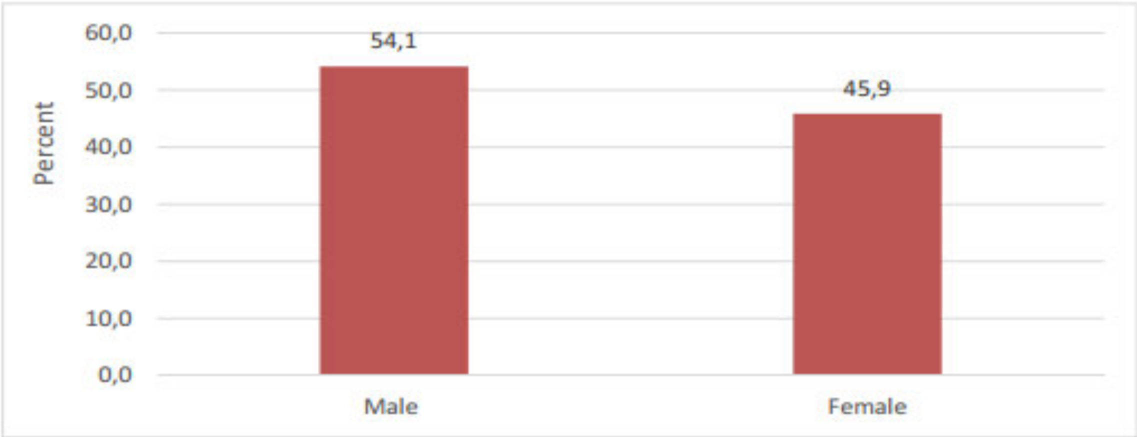


Figure 2.7: Gender distribution of the South African emigrants between 2006 and 2016 (Stats SA Community Survey, 2016)

Emigration data from the gender equal societies shows that the share of female migrants is higher than that of the male migrants, with North America and Europe having 51.8% and 51.4% female migrants respectively. This was much higher than the females in unequal societies of sub-Saharan Africa with 47.5%, North Africa with 35.5% and Western Asia with 35.5% (UN DESCA, 2019). This 9% difference in the South African male-female emigration distribution is therefor expected to grow smaller as it transforms into a gender equal society because women will increasingly choose to migrate on their own rather than following their husbands.

2.2.2.4 Emigration Potential & Workforce Planning

Workforce planning is an integral part of a thriving petrochemical company and all possibilities, including emigration, should be taken into consideration during workforce planning. It must be noted that planning for emigration can be complex as not all employees who express the desire to emigrate will end up doing so (Crush, McDonald, and Williams, 2000). The South African Migration Projected (SAMP) developed an index to evaluate the true emigration potential of South Africa's skilled population which showed that 2%, approximately 32 0000 individuals, had a very high emigration potential, 10% had a high emigration potential and 25% had a moderate potential to emigrate (Crush - as cited in Fourie, 2006). Work conducted by Crush et al., (2000) and a few years later by Mattes and Mniki (2004), measured the concept of emigration potential of the studies' participants by evaluating the indicators listed below:

- Whether or not the desire to emigrate exists?
- To what extent has emigration been given thought or consideration?
- How much action has accompanied the desire to emigrate. For example, have they applied for jobs, have visa applications been made, have they put up any of their assets for sale etc.?
- What barriers which are beyond their control may prevent them from emigrating?

2.2.2.5 The Economic Impact of Emigration

The emigration of highly skilled South African professionals is not a new phenomenon. It has however become more common which has resulted in a high loss of investment due to the expenses incurred for the education and training and education of these professionals (Ince, 2020; Statistics South Africa – as cited in Swart, 2009; Mittner - as cited in Eagar, 2008). Research conducted by the South African Migration Programme estimated loss of investment due to the emigration of medical professional to be USD 1.4 Billion (Crush, Chikanda, Bourgeault, Labonte, and Murphy, 2014). In instances where the entire family emigrates, those employed by the emigrating family as domestic workers, gardeners, nannies etc. become jobless, which only puts further strain on the economy and government social grant welfare system.

An additional consequence is reduced tax revenue due to a shrinking of the tax-base, which is a real danger for South Africa because between 2017 and 2018, the number of taxpayers decreased by 574 000 from 5.491 million to 4.917 million while social grant recipients increased to 17.616 million in 2018/19 (Brothwell, 2020). The loss of highly knowledgeable and skilled employees results in labour mismatches and consequently lowers productivity levels, adversely affected economic growth and innovation which ultimately compromises the countries competitiveness.

The loss of skilled workers also results in mismatch in filling vacancies with either underqualified or overqualification candidates resulting lower productivity. In some instances, the current employees are expected to take up to take on the additional responsibilities to close the gap resulting from the vacancy (Brothwell, 2020; Guzi, 2018; Glassy and Choi – as cited in Bailey, 2003). The extent to which migration policy can address the issue of labour shortages and skill gaps is a being widely debated, though Estonia has recently made legislative changes to their immigration system and Work in Estonia Action Plan to attract skilled migrants and close the skills gaps in Estonia (EMN, 2017).

2.2.2.6 Economic Gain Remittances

The gain from the emigration of skilled employees is in the form of individual, private, non-market money transfers i.e., remittances from the host countries to South Africa (World Development Bank, 2016; Ragarajan, 2009). The neoclassical migration is driven mainly by resource constraints in the home country, for example, poor salaries or high unemployment, which is evident from the USD 700 million remittance flows into back to South Africa in 2006. Remittances can also contribute to the economy by allowing entrepreneurial households to pursue more risky asset accumulation strategies, explore business ventures that can contribute to South Africa's long term growth potential (Acosta et al., 2007 – cited in Ragarajan, 2009). One way of reducing household income risk is through family income diversification by the labour migration of a family member(s) with the sole aim of the family member(s) abroad being to remittances. This can result in more emigration if the remittances result in a better quality of life (Porumbescu, 2015; Weeks, 2012). High income counties like the USA and Saudi Arabia are the leading sources of remittance outflows, with approximately US$149 Billion and US$46 Billion respectively in 2017. Global remittances in 2017 were the largest source of external funding, amounting to a total of $625 billion, with US$41 billion going to sub-Sahara Africa alone (Pew Research Centre, 2019).

The fundamental emigration drivers of the household economic theory towards an improved quality of life and security, are similar to those that drive the individual level neoclassical economic theory, a case in point being Chinese migrants in Africa spending the first year's salary on the repayment of a mortgage loan or down payment for a new apartment or flat in China, that will provide financial, emotional and social security upon their return to China as it enhances the prospects of finding a marital partner (Driessen 2016). Remittances often bypass government controls, but the increasing government debt in South Africa, the government has as of the 2021 tax year revoked the tax-free benefit on remittance income and has put in place a revised tax regime for expatriates where the first 1.25 million rand is tax exempt (Businesstech, 2021; Bastiaens, 2019). To quality for this exemption, the expats must spend more than 183 days outside of South Africa during a 12-month period, of which a minimum of 60 days must be consecutive (Businesstech, 2021).

2.2.3 Brain Drain, Brain Gain and Brain Chain

2.2.3.1 Brain Drain

Brain drain is defined as the emigration of the skilled labour with their talent, knowledge and experience which results in the depletion or loss of critical skills in a variety of technical and professional roles in a country's private sector, thereby negatively affecting its economic growth. (Babar *et al.* 2018; Topkaya 2015; Crush, McDonald, and Williams, 2000). This economic effect is especially pronounced when the sending country is small, as in the case of the some of the countries in the Caribbean like Jamaica, Haiti and Trinidad and Tobago (Elsner, 2015).

Brain drain, also called brain export or talent exodus, has been an increasing threat to South Africa. South Africa has experienced high rate of emigration of its healthcare personnel to the United Kingdom and other developed countries due to the perception of higher wages better safely and security which has put a strain on our healthcare resources (Adepoju et al., - as cited in Lehohla, 2015). The brain drain not only applies to the employed, but also to bright minds who choose to further their post-graduate education, which has now been made easier due to cheaper transportation, better communication, foreign student exchange programs that provide students with adequate financial support during the studies. (Epping, Morissens and Vossensteyn, 2011). To close the skills gap in the workplace, some methods used by employers include increasing wages and benefits, increased focus on training and development to upskills less skilled workers, making changes in the production and work processes, increasing imports, and hiring a migrant labour force (Martin and Ruhs, 2011– cited in Guzi 2018; Elsner 2015). The biggest concern for South Africa is that, unlike the unskilled migrant labour force that helped to rapidly redevelop the Western European countries after World War II, it's receiving a high number of economically inactive immigrants who contribute less to development of the country when compared to the large number of highly educated professionals lost due to emigration.

Furthermore, the professionals leaving the country are tax paying citizens, for example, engineers, architects, medical professionals, accountants, as well as secondary and university educators. These individuals have many years of working experience, often in highly specialized fields, with a high potential for innovation, they are high performers who are leaders in capacity and intelligence (Ince, 2020).

2.2.3.2 Brain Gain

Brain gain can be broadly defined as the process whereby a host country gains from the movement of migrants, as result of the increase in skills, knowledge, and experiences. In addition to attracting skilled individuals, host countries are realizing more and more the benefits of retaining students after their graduation, a significant number of the students do not return home after graduation resulting in brain gain for the host country and drain for the sending country (Shin & Moon - as cited in Ince, 2020; Epping, Morissens and Vossensteyn, 2011). While South Africa has suffered from brain drain, it has also benefited from an influx of highly skilled labour, brain gain, from African countries like countries like Zimbabwe, Ghana. Zambia etc. (Adepoju et al., – as cited in Lehohla, 2015; Kabwe-Segatti and Landau 2008). It is important to note that adopting strategy of closing the skills gap with the influx of skilled labour can result in overdependence on a migrant workforce, as in the case of Qatar where less than 1% of the private sector workforce is made of Qatari nationals with most of the jobs occupied by foreign nationals (Babar et al., 2018). Brain gain also has an impact on the economy with the OECD/OIL (2018) report showing that economically active migrants make a substantial contribution to the South African economy, with their GDP contribution of around 9.1% in 2011 which is 0.1% less than their share in employment of 9.2%.

2.2.3.3 Brain Chain

The brain chain is created when professionals and/or students move abroad to gain new knowledge, skills and expertise and later return home, a few years of being abroad. These returning or repatriating emigrants now use their newly acquired skill set, experience, and knowledge to contribute to the development of their home countries by starting new businesses and sharing their knowledge through training and education (Epping, Morissens and Vossensteyn, 2011). As stated by Winters (2008) and Batalova et al*.,* (as cited in Ince, 2020), for brain recirculation to be effective and mutually beneficial to both the sending and receiving country the following three basic dynamics that promote it must exist:

(i) Increased level of awareness about the importance of foreign professionals and their potential contribution to development.
(ii) The signing of bilateral agreements.
(iii) The development of educational infrastructure which are the cornerstone of brain recirculation due to them being centres of excellence that produce a highly skilled force.

The research done by Shin sand Moon (2018) to determine if foreign University Doctoral students were planning to return to their home countries after graduation. The findings showed that 48% of the 2323 Doctoral students wanted to remain in the United States of America after graduation, 40% were still undecided with only 12% saying they're considering returning home after graduation. This work emphasizes the importance of bilateral agreements, to promote brain recirculation, that will allow post-graduate students to return home after they've completed their studies. Without these signed agreements, the probability is strong for these postgraduate students to remain the host country.

2.3 Theoretical Review

2.3.1 Push and Pull Factors

International migration is influenced by factors that "push" the migrants away from their country and "pull" factors that pull them to the desired country of residence (Ullah and Haque 2020Lee, 1966, cited in Hager-Zanker, 2008; Asch, 1994). Besides the traditional economic push factors that result in highly skilled employees leaving their home countries i.e., economic problems such as unemployment and a high cost of living, taxation, a lack of infrastructural development, recent studies have shown that other factors linked to quality of education, and social and cultural problems like poverty, crime and war as well as natural phenomenon like climate change, natural and environmental disasters can also play a major role in the decision to emigrate (Driessen 2016; Topkaya, 2015; Mattes and Richmond - as cited in Campbell, 2002).

Some of the pull factors that can result in the emigration of skilled employees to the desired country are better wages, career advancement, a better quality of life and social welfare systems, better work-life balance and advanced democracies that built on human rights and religious liberty (Tan, Toan & Tuyet - as cited in Okičić, 2019; Asch, 1994). Research by Dilanchiev (2015) showed that Georgian citizens are emigrating in their hundreds of thousands to look for work in other countries. While the primary driver was economic reasons, factors that contributed to the decision ranged from poor governance, electricity and energy shortages, a deterioration of public service, a strained economy resulting in high rates of unemployment that are making the general living environment very difficult.

2.3.3.1 Economic Push and Pull Factors

Micro-Economic Factors - Better Salary in New Country

The neoclassical economic theory has long been the main theory used to explain the motivation for international migration. This theory states that the salary difference between the home country and the destination country services as the primary push or motivation for emigration (De Haas - as cited in Lee et al., 2017; Todaro, 1976 – as cited in Bohlman, 2010). The higher salary abroad, along with depreciation of salaries in the home countered, will increase the incentive to emigrate from the lower-wage region to the higher-wage region, especially for liquidity-constrained or indebted individuals (Djajica, Kirdarb and Vinogradovac, 2016; Weeks, 2012). Research of Dilanchiev (2015) found economic reasons to be the main driver for large scale emigration of Georgian citizens, is consistent with the neoclassical economic theory because the emigration was towards countries that had a growing or stronger

economy. The study by Djajica et al., (2016) further showed that emigration was more pronounced when the migration related costs were lower, which was consistent with the emigration model developed by Shields and Shields (1989) which was based on earlier work by Sjaastad (as cited in Bodvarsson and Van den Berg, 2013).
Emigration is therefore expected to continue until the gap in wages is reduced merely to the costs of migration (Weeks, 2012). In their work, Shields, and Shields (1989) developed a model (I) to explain the movement of labour from location A to location B If the wage in B is higher than in A.

$$M_{AB} = \alpha_{AB} (W_B - W_A) \quad \text{(I)}$$

Where: M is the number of migrants, W is the wage, α is represents the barriers to migration, for example distance, uncertainty due to insufficient information, migration related costs etc. The value of α will decrease as the barriers to migration increase thereby making emigration more pronounced when the factors like costs and uncertainly due to insufficient information are low (Djajica et al., 2016; Shields and Shields, 1989). Emigration will therefore continue until the wage difference reduces to a point where it equals the cost of migration or when the wages of the non-emigrants in the home country rise sufficiently, due to the skills shortages and lack of competition in jobs that have the highest rate of emigration i.e., the non-emigrants and therefore get greater salary bargaining power (Elsner 2015; Sjaastad 1962). In summary, migrant will choose to work in the location that yields the most benefit for them after comparing the cost and benefit of working in their current location relative to the cost and benefit of working in the new prospective location. This benefit can be experienced by the migrant and the host country because it can result in social and cultural exchange, enculturation, in addition to knowledge, skills and technology transfer where appropriate migrant policies exist (Ullah and Haque, 2020).

Macro-Economic Factors - Price levels and Inflation

Macroeconomics is the subset of the economics that studies how the economy as whole behaves or functions by examining economy-wide phenomena such as the average price levels and inflation, the exchange rate, interest rates, gross domestic product, and economic growth, unemployment, and the labour market (Jochumzen, 2010). Inflation is defined as the percentage increase of the consumer price index between two points in time, typically one year, where the consumer price index is defined as; a “basket” of goods. In simpler terms, inflation is the percentage change in the price level of goods and services causing money to lose purchasing power year on year (Jochumzen – as cited in Tulong and Handayani, 2018). The price levels play a central role in the field of economics. Price levels in microeconomics deal with the prices of individual goods and services whereas price levels in macroeconomics deals with how prices in the economy change on average, over a specific time, and is therefore a weighted average of several different prices (Jochumzen, 2010).

Figure 2.8 shows that the general yearly average inflation range between 2000 and 2017 is between 4-6.5%, which is within the South African Reserve Bank targeted inflation of 3-6%, even though some high peaks and low drops exist, for example the high peak of 12.5% in January 2003, and the low drop to 0.2% in January 2004 (Naidoo, 2022; Taborda, 2017).

Figure 2.8: South Africa’s inflation for a 16-year period between the years 2000-2016 (Taborda 2017)

Table 2.1 below shows the month to month and yearly average headline CPI between 2016 and 2020. The yearly average headline CPI for the period between 2016 and 2020 ranges between 3.3 % to 6.4%, with the highest average headline CPI of 6.4% being in 2016 and the lowest headline CPI average of 3.3% being in 2020. The yearly average headline CPI between 2016 to 2020 has been steadily decreasing by 0.6% to 1.1%. The year 2020 had the largest annual headline CPI decrease of 1.4%, between January and December, since 2017 where the yearly decrease was 1.9%. This 1.4% decrease in headline CPI was due to dropped from a 4.5% CPI in January to a 3.1% monthly headline CPI in December 2020. The two months with the lowest monthly CPI for the period under consideration i.e., 2016 – 2020, were May and June 2020 with a monthly CPI of 2.1% and 2.2% respectively. The low 2020 headline CPI of 3.1% coincides with a democratic era record low repo rate of 3.50% by the South African Reserve Bank (SARB) in November 2020 (Ndaba, 2021). The SARB slashed the report rate four times in 2020, to an accumulative 275 basis points, in attempt to limit the impact of the Covid-19 pandemic on the South Africa's crippled economy, which has been a strategy followed by central banks globally (Friedman et. al., 2020). According to Ndaba (2021) the 3.5% repo rate was largely expected to be maintained throughout 2021, although there is room for a further 25 basis point reduction in the report rate to a repo rate of 3.25%.

Table 2.1: South Africa's headline CPI between 2016 and 2020

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average[1]
2016	6,2	7,0	6,3	6,2	6,1	6,3	6,0	5,9	6,1	6,4	6,6	6,8	6,4
2017	6,6	6,3	6,1	5,3	5,4	5,1	4,6	4,8	5,1	4,8	4,6	4,7	5,3
2018	4,4	4,0	3,8	4,5	4,4	4,6	5,1	4,9	4,9	5,1	5,2	4,5	4,7
2019	4,0	4,1	4,5	4,4	4,5	4,5	4,0	4,3	4,1	3,7	3,6	4,0	4,1
2020	4,5	4,6	4,1	3,0	2,1	2,2	3,2	3,1	3,0	3,3	3,2	3,1	3,3

Source: Stats SA (2020)

South Africa's CPI inflation range of 3-6% is 100% to 300% higher than that of the popular emigration destination countries for skilled South Africans. The popular host countries like Australia, New Zealand, United Kingdom, USA, Germany, and UAE, had a CPI inflation of 2.1%, 2.2%, 2.9%, 1.9%, 1.5% and 1.9% respectively in May 2017, compared to 5.4% for South Africa for May 2017 (Trading Economics, 2017). By July 2022, South Africa's CPI had raised to a 13-year high after it reached 7.8%, which prompted the South African Reserve Bank to raise repo interest rates sharply by 75-basis points from 4.75% to 5.5% in attempt to rein in the CPI inflation rate that had reached 7.8%. The inflation on the perishable and non-durable items are of particular concern for the population because, the inflation on these items, for example medicine, food, drinks fuel, electricity is around 14.4% which is almost 300% higher than the inflation for durable goods and services which had a CPI of 4.8% and 4.2%

respectively in July 2022. By December 2022, South Africa's CPI inflation rate had dropped to 7.2% (Naidoo, 2022; Stats SA, 2022).
The higher CPI inflation for South Africa means that the cost-of-living increases at a faster rate when compared to the popular host countries for skilled South Africans. Furthermore, it can also result in a lower disposable income for many households should their salary increases be lower than the inflation rate. The Stats SA (2022) CPI data from November 2022 showed that the following food price increase from the previous year, November 2021:

- Onions increased by 43.3%
- Bread four and cake flour increased by 27.7% and 33% respectively.
- Coffee beans and/or ground coffee increased by 24.8%.
- Ice cream increased by 24.6%.

The astronomical rise in the cost of fuel between 2021 and 2021 has left many South Africans bewildered. Between July 2021 and July 2022, the price 95-octane petrol increased by 56.2% from R17.39 to R26,74. The price of diesel increased from R16.58 to R26.61 in the same period. Another factor that has increased the pressure on the general population are annual municipal electricity tariffs which are increased in July each year, which increased by 7.5% in 2022 which was on par with the National Energy Regulator of South Africa (NERSA) benchmark of 7.5% (Stats SA, 2022).

Macro-Economic Factors - Interest Rates

The interest rate is commonly defined as a percentage or portion of a loan amount which the lender charges as interest to the borrower, typically per year (Jochumzen, 2010 – as cited in Tulong and Handayani, 2018). The South African Reserve Bank (SARB) which oversees the banking system and is responsible for regulating the amount of money in the economy, uses the headline CPI as the inflation target measure to guide the setting of interest rates to keep the economy balanced i.e., achieving stable economic growth, stable prices, and the target employment rates (Folger, 2017; Jochumzen – as cited in Tulong and Handayani, 2018). The general relationship between inflation and interest rates in inversely proportional i.e., inflation increases as the interests decrease. This inversely proportional relationship is because lower interest rates enable more individuals to borrow money, resulting in greater spending which stimulates the economy and grows resulting in an increase in inflation (Folger, 2017). The opposite is also true, where an increase in interest rates results in more individuals saving more due to better returns on investments. This increase consumer savings consequently results in less consumer spending which slows the economy and reduces inflation.

In July 2022 the South African Reserve Bank raised the interest rate by 75-basis points to 7.8% to reduce inflation and lower food prices. During this period July 20222 period, the non-durable and perishable necessities like bread, fuel, electricity, housing, and utilities all had a noticeable impact consumer price index reading (Naidoo, 2022; Stats SA, 2022). As aforementioned, another impact of SARB interest rate increase is the direct increase in the lending rate i.e., the prime interest rate charged by commercial banks when lending money to the public. The cost of debt has therefore progressively increased from 7.75% in April 2022 to 9.75% in October 2022 and 10.75 in January 2023 (Fourie, 2022; Trading Economics. N.d).

Macro-Economic Factors - Exchange Rate

Jochumzen (as cited in Tulong and Handayani, 2018) defines the exchange rate as the price of one unit of currency in terms of another currency. Most countries express the exchange rate by using the foreign currency as the base currency. For example, in South Africa, the US Dollar (USD) would be expressed as 12.95 Rand (ZAR) per USD. The South African Rand (ZAR) has, over the last 10-year period, performed poorly against the USD and other major currencies like the British Pound and the Euro.

Figure 2.9 below shows that between 30th December 2010 and 20th January 2015, point A and B respectively, the ZAR depreciated from 6.62 to 15.89 to the USD and to 16.86 at point C by the 27$^{th\ of}$ January 2023. The Rand weakened by 6% 2022% against the US Dollar in 2022 (Trading Economic, 2023; Naidoo 2022; SA Reserve bank 2017). This steady deprecation of the ZAR correlates strongly with the steady increase in emigration between 2011 and 2015, as shown earlier in Figure 2.4, where emigration increased from 4.8% to 25.7% over this five-year period (Stats SA Community Survey, 2016). This positive correlation between a weak currency and increasing emigration is an indication that the macroeconomic impact of a depreciated or weak rand, and weaker Rand-US Dollar exchange rate, is influencing the decision to emigrate.

Figure 2.9: The ZAR-USD exchange rate trend for the 20-year period between January 2002 and January 2023 (Trading Economics, n.d)

Macro-Economic Factors - Gross Domestic Product (GDP) and Economic Growth

The gross domestic product (GDP) is defined as the total market value of finished goods and services produced and sold directly to the consumer in country during a one-year period. South Africa's GDP of 351 billion in 2019, is a far cry below that of the top 5 countries USA, China, Japan, Germany, and the UK with GDPs of $21.4 trillion, $14.3 trillion, $5.1 trillion, $3.8 trillion, and $2.8 trillion respectively (World Bank 2019). South Africa's smaller GDP is like that of the other previous European colonies that that have experienced slow post-colonial economic growth due to political instability and lack of technology, which are a legacy of European rule (Ullah and Haque 2020). Economic growth is defined as the percentage change in the GDP over a period. This can be in terms of the real GDP, where the effect of inflation is removed or the nominal GDP where the effect of inflation is not removed (Jochumzen – as cited in Tulong and Handayani, 2018). It is important to note that while short term economic growth can be achieved through measures and instruments that improve productivity and efficiency, the foundation of long-term economic growth and technological innovation is the presence of a highly skilled workforce (Akman et al., 2020).

South Africa's economy is currently in a low growth trap having experienced 0.5% growth in 2016 and its second technical recession since in eight years after the GDP contracted by 0.7% in June 2017 (le Cordeur, 2017; Fin24, 2017). Though the economy was only expecting to grow by 0.2-0.6 % in 2017, it performed expected better than expected with an eventual growth of 1.3% (StatsSA, 2018; Smith 2017; le Cordeur 2017). While both Smith (2017) and le Cordeur (2017) expected South African economy to move from low growth to the low-medium growth of between 1.5-2% after 2019. The economic growth after 2019 has been stagnating at an average of around 1% until 2023, due to the knock-on effects from a variety of reasons. Some of these reasons include unreliable electricity supply due to rolling power cuts by the power utility Eskom which supplies 95% of South Africa's electricity, increased government debt, a shortfall in revenue collection which is US$ 4.1 billion less than what was projected, investment rating downgrades to junk status, and budget deficit of US$ 6.8 of the GDP (Isilow, 2020).

Unemployment and the Labour Market

The labour market is an important subset of macroeconomics because it deals with amount of labour used in a specific period and the cost thereof, which are important variables for calculating the total production and GDP (Jochumzen, 2010). The unemployed individuals are that part of the population who are actively searching for work but are unable to find it, expressed as the narrow unemployment rate where this rate represents the unemployed as a percentage of the economical active population or total workforce (Nickolas, 2021; Mlynarčík, 2018; Pettinger, 2010). The expanded unemployment rate includes unemployed individuals of the population who are not actively seeking employment (Businesstech, 2017). According to Jochumzen (2010) and Nickolas (2021) unemployment can be classified into the following categories as shown in Figure 2.10:

(i) ***Structural Unemployment:***

This type of unemployment is due an individual’s skill set becoming redundant due to changes in technology and not meeting skills requirements for the present job opportunities, and/or demographic changes in their geographical area of residence. This category of unemployment is over a longer term, typically many years, and require the unemployed to either upskill, by undergoing additional training, or moving to another region where their skill set is required. This type of unemployment also requires concise and extensive effort to reverse. An example of structural unemployment are job losses in United States manufacturing sector, due to increase automation and technological advancement reducing the demand for manual labour. Among others, a solution to reversing structural unemployment is to provide virtual or face-to-face training programs to candidate for them to acquire the skills required to fill jobs that are in demand (Nickolas, 2021; Jochumzen, 2010)

(ii) ***Frictional Unemployment:***

The nature of this unemployment is temporary or short term and characterized by individuals who have left one job and are in search of another better paying job. Employees quit their jobs because they believe sufficient opportunities exist to not fear the possibility of long-term unemployment. New university or tertiary education graduates also add to frictional unemployment because, they are new labour market and often lack the resources to find suitable job that match their skill set (Mlynarčík, 2018). Frictional unemployment is always present in the economy, irrespective of existing economic conditions, and differs from structural unemployment in that it is voluntary. Unemployment benefits paid by the government often adds to frictional unemployment because the candidates can be selective about the jobs for which they apply, while times of economic recession reduces it because employees prefer the security of their current job (Kagan and Kelly, 2020).

(iii) ***Cyclical Unemployment:***

This unemployment is due to an economic downturn, for example, an economic recession where the economy has two consecutive periods of negative growth, and the 2008 financial crisis. Changes in the business environment and or global pandemics like COVID-19 also affects the demand for labour resulting in retrenchments to reduce the labour costs. It is important to note that cyclical unemployment can become structural when the unemployed required to upskill to become employable again. A recent example of cyclical unemployment was the 2 million jobs lost in the South African economy in the second quarter of 2020, resulting in a record high unemployment rate by the fourth quarter of 2020 (Nickolas, 2021; Winning, 2020).

(iv) ***Classical Unemployment:***

This unemployment category in involuntary i.e., people are willing to work but are unable to find work because the wages in the market being too high. This can be caused by having a trade union bargain for a minimum wage that is too high for employers to meet (Jochumzen, 2010). The natural unemployment rate is defined as the total sum of the classical, frictional, and structural unemployment rates and does not consider the cyclical unemployment rate (Jochumzen, 2010).

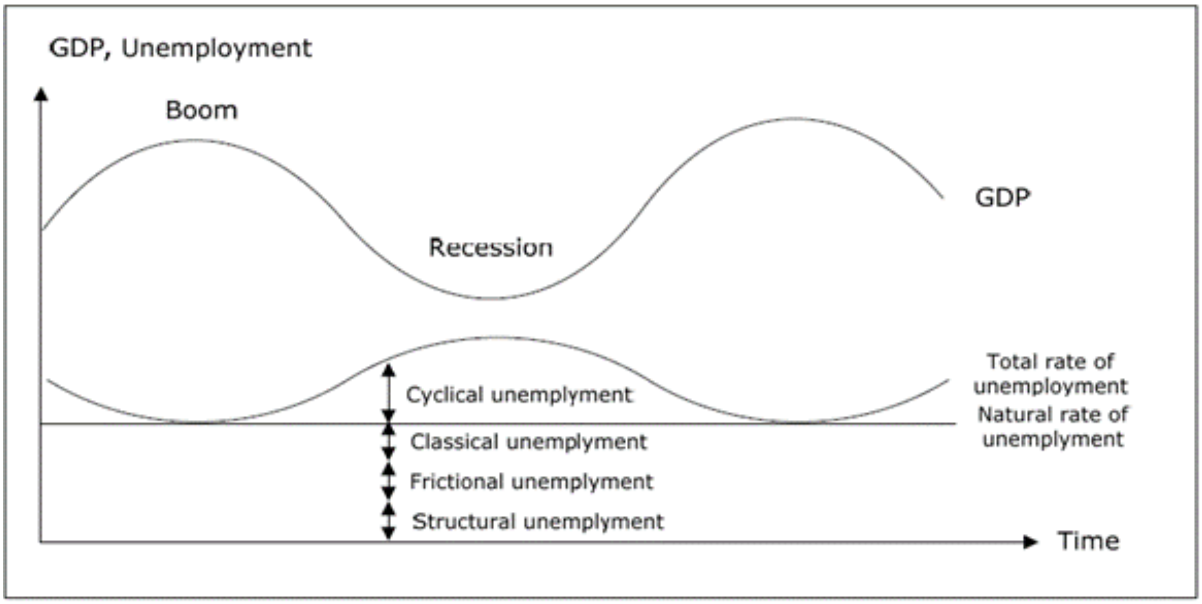


Figure 2.10: Types of unemployment categories (Jochumzen 2010)

Figure 2.11 shows a graphical trend of South Africa's narrow and expanded unemployment rate between 2000 and 2014, with a narrow and expended unemployment rate of 25% and 36.4% in 2014 (LMIP, 2016).

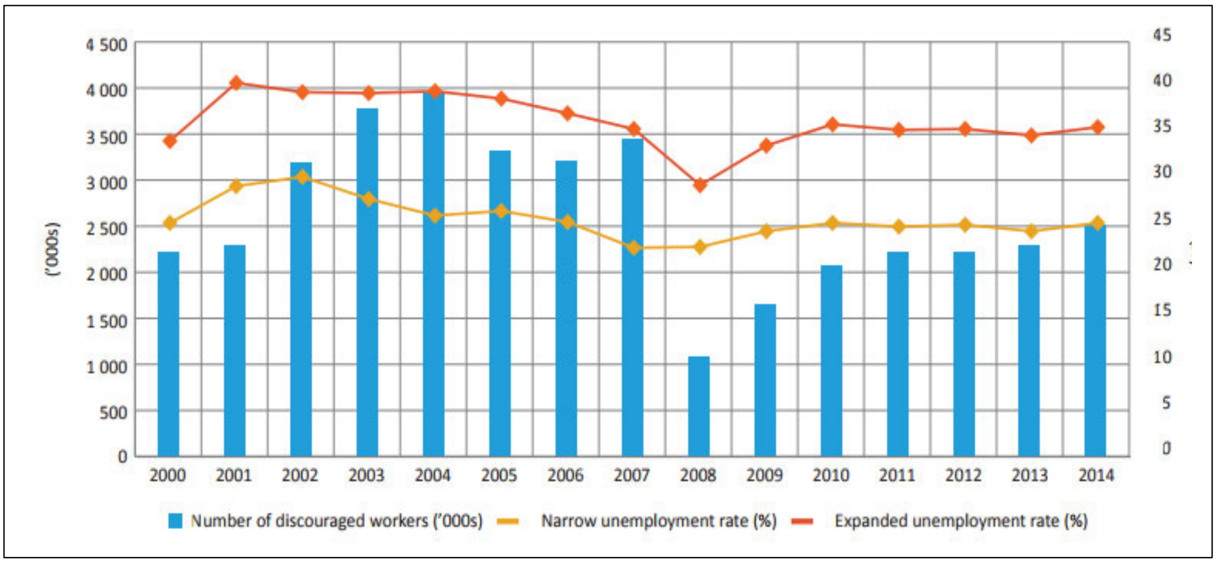


Figure 2.11: South Africa's unemployment rate between 2000 and 2014 (Statistics South Africa – cited in LMPI 2016)

The unemployment rate has steadily increased from 2014 to 2020 with South Africa hitting a record high rate of 30.8% in the third quarter of 2020, the highest rate since the start of quarterly unemployment statistics in 2008. The expanded unemployment rate, representing discouraged worker who have given up looking for work, also hit a record high of 43.1% in the quarter 3 of 2020. South Africa's unemployment rate is higher than the global average of 5.42%, and much higher that the unemployment rates of the desired destination countries like USA, Canada, New Zealand, Australia, UAE, Qatar, Saudi Arabia, and the United Kingdom who all have and unemployment rate between 0.1% to 5.3% (World Bank, 2020).

The COVID-19 pandemic multi-level lockdowns have had a detrimental impact on South Africa's economy and unemployment rate, considering its economy was in recession just before it recorded its first Coronavirus injection in March 2020 (Winning, 2020). The record high unemployment rate in the 3rd quarter of 2020, driven by the 2.2

million people losing their jobs in the 2nd quarter, was consistent with job loss forecasts by Nedbank. Nedbank estimated that 1.6 million jobs would be lost in the first 6 months of 2020, which was very high when com compared to the 900 000 jobs that were lost after the 2009 global financial recession (Businesstech, 2020). It is important to note that while the unemployment rate is very high, unemployed graduates only comprise a small fraction of the total number. For example, in 1st quarter 2020 the Quarterly Labour Force Survey (QLFS) conducted By StatsSA showed that from the national unemployment rate of 30.1%, only 9.5% of this figure were graduates compared to 35.2% who were individuals without a Matric Certificate (StatsSA, 2020).

To recover from the economic devastations, South Africa may need to structural labour-market reforms to remove any and/or all barriers that prevent a free labour market system, that would improve the efficiently of allocating scarce resources resulting in economic growth. Some of these barriers that prevent the fluidity and efficiency of the labour market are, but not limited to decreasing the power of trade unions, making hiring, and firing easier and introducing policies that reduce unemployment benefits (Brancaccio, 2018).

2.3.**3**.2 Social Push and Pull F**actors**

Social challenges like poverty, inequality, high violent crime, lack of security and stability, the rising cost and deteriorating quality of education and healthcare services are some of the social factors that contribute to emigration of South African engineers (Swart, 2009). The wider societal entities/conditions can play a major role in the decision to become a labour migrant (Stark 1991 – cited in Porumbescu, 2015). This is also supported by research conducted by Babar et al., (2018) showing social security and stability had a big contribution to the decision of Arab migrants towards long-term emigrate to Qatar. Research conducted by Driessen (2016) had similar findings about the increased Chinese migration to Africa being due Africa being revealed that the Chinese migration to Africa was seen as an attractive way out of the rural poverty, societal pressure, lack of freedom and a growing lack of security that were confronted with daily in China, even though the narrative being widely spread for the migration was one of advancement, self-determination, and self-actualization.

Poverty and Economic Inequality

The consideration of societal conditions like poverty and rising cost of living in the country of origin have led to the new household economics of migration theory, where the approach to emigration is fundamentally made in the context of what is best for the family or household. This approach to decision making is therefore inherently a collective process unlike the neoclassical economic theory where the decision to emigrate is made at an individual level (Porumbescu, 2015). This is because families will always look to maximizes expected income while minimizing risk because they are generally risk averse when it comes to family income (Porumbescu, 2015; Weeks, 2012). Remittances contribute to the improvement of living standards of recipient households by meeting their financial needs, for example, costs of education and healthcare etc. (Ragarajan, 2009).

Individual Crime

Individual crime comprises of murder, sexual offences, assault/battery which excludes sexual assault, theft of personal property, street robbery, consumer fraud, sexual offense, and hijacking. While social fabric crime is a subset of individual crime and comprises of only of theft of personal property, assault, murder, and sexual assault (Statistic South Africa P0341, 2019; Statistics South Africa, 2016). Social fabric crimes are usually difficult to police, reduce or prevent because these crimes occur between friends, acquaintances and members of the same family and are often exacerbated by alcohol and drug abuse. Research among prisoner inmates that struggled with substance use problems, showed that binge drinking was more prevalent in violent offenders, with illicit drugs negatively associated with fatal violence (Håkansson and Jesionowska, 2018; Fanaroff *et al.,* 2004).

Table 2.2 below shows that theft of personal property account for 6% of the total crime is by far the most common crime experienced by individuals, when compared other individual crimes like street robbery and hijacking. Theft of personal property has been steadily increasing over this 5-year period between 2015 and 2020, with 1.9 million individuals experiencing this crime in 2015/16 to 2.4 million experiencing it in 2019/20. Street robbery was the second highest individual crime experienced with the number incidents increasing from 670 000 in 2015/16 to 1.1 million in 2019/2020, signifying a 1% increase from 2015 to 2020.

Consumer fraud, for example the famous R99 debit order, was the crime with the sharpest increase in the individual crime category of 1.3% between 2017/18 and 2019/20 i.e., an increase of 497 000 cases, from 170 000 cases (0.4%) in 2017/18 to 670 000 cases (1.7%) in 2019/20 (Statistics South Africa P0341, 2019). Research by Ajimotokin et al*.,* (2015) and Fanaroff et al. (2004) showed that social fabric crime is directly linked to unemployment, poverty rates and high school graduates and number of police officers per 100 0000 inhabitants with areas that had higher unemployment, higher poverty rates and lower high school graduates and lower police officers per 100 000 inhabitants exhibiting higher levels of social fabric crime. With South Africa's high narrow unemployment rate of 30.8%, social fabric crime is bound to be a consistent problem to bring under control, to levels experienced in desired host/destination countries.

Table 2.2: Shows the contact crime statistics from 2015/16 to 2019/20

Indicator	Statistics	Year				
	Numbers in thousands	2015/16	2016/17	2017/18	2018/19	2019/20
Theft of personal property	Number	1 894	1 762	1 844	2 344	2 400
	Per cent	5,1	4,6	4,8	5,9	6,0
Street robbery	Number	679	738	735	1 126	1 109
	Per cent	1,8	1,9	1,9	2,8	2,8
Assault excluding sexual assault	Number	683	590	600	599	495
	Per cent	1,8	1,6	1,6	1,5	1,2
Consumer fraud	Number	233	200	147	173	670
	Per cent	0,6	0,5	0,4	0,4	1,7
Hijacking	Number	162	159	152	198	265
	Per cent	0,4	0,4	0,4	0,5	0,7
Sexual offence	Number	117	134	126	98	113
	Per cent	0,3	0,4	0,3	0,3	0,3

Source: Statistics South Africa P0341 (2020)

Murder

The UNODC global homicide study (2013) confirms that South Africa has one of the highest murder rates in the world per 100,000 of the population, with seventy percent (70%) of these murders resulting from interpersonal conflicts, disputes, and arguments. Albeit high when compared globally, Southern Africa's high murder rate has been in steady decline, from 63.9 to 31.0 per 100,000 population, in the 16 years between 1995 and 2012 (UNODC, 2013). Figure 2.12 shows the murder rate trend between 1995 and 2017, where the trend showed a steady decline in murder rates for South Africa between 1995 and 2011 from 63.9 to 29.8 per 100 000 population (UNODC, 2013, Macrotrends, n.d.). The murder rate has however seen a steady increase from the 2011 historic low of 29.8 per 100 000 population to 35.9 per 100 000 population in 2017, which is still close to 6 times higher than the 2017 global average of 6.1 per 100 000 population (UNODC, 2019). The destination locations for South Africans have a rate much lower than the global average. For example, the United Kingdom and Ireland had only 1 murder per 100 000 population in 2018, with the preferred European countries like the Netherlands, Germany, and France also having only 1 murder per 100 000 population. The middle easter countries like Oman and the UAE had 0 murders per 100 000 population in 2017/18, with the USA and Canada recording 5 and 2 murders respectively per 100 000 population in 2018 (World Bank, n.d.).

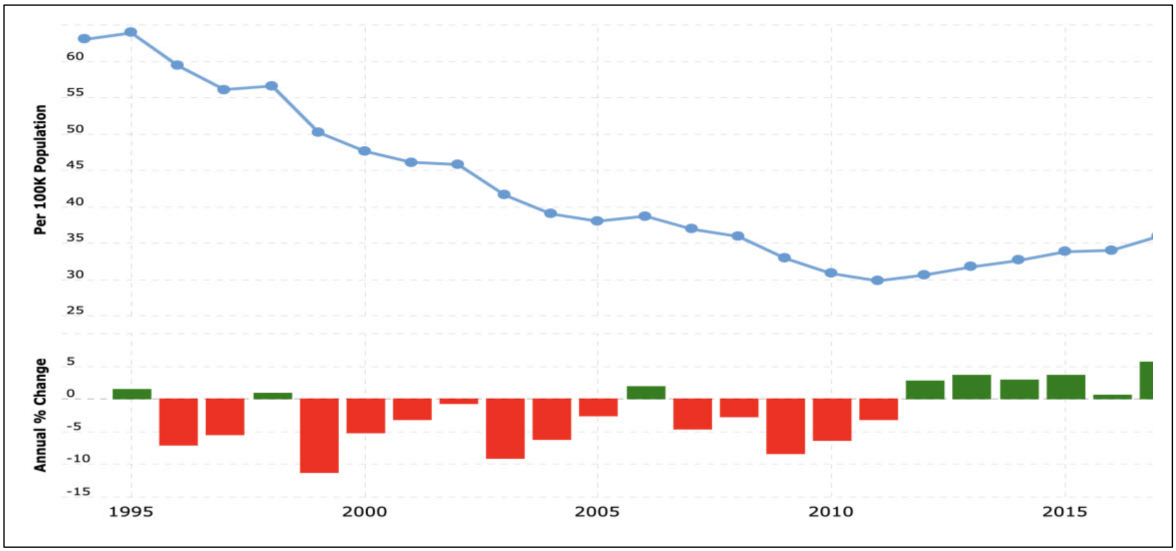


Figure 2.12: The murder rates for South Africa between 1995 and 2017 (Macrotrends, n.d.)

Household Crimes

Data further showed that people who resided in the effluent areas where more likely to experience property-related crime, for example, burglary, armed robbery, theft of motor vehicle, deliberate damage to property etc. (Statistics South Africa P0341 2019; Fanaroff et al., 2004). Citizens who reside in urban areas are most vulnerable to attack at period when their alarms cannot be activated and when they are present to locate items of value i.e., when they arrive home or leave home. The Statistics South Africa Statistical Release on crime (2019) showed that housebreaking/burglary has been consistently on the rise between 2015 and 2019, with incidents of this crime increasing from 2.1 million to 2.3 million. This was higher than experienced in the destination counties with the UK recording 402 000 incidents of burglary in 2019/2020, which is more than a 50% drop-in burglary rates from 2002/03 where 949 000 burglaries were recorded (Clark, 2020). While burglaries have been on the declined the UK, the overall crime rates have been steadily increasing from 70.1 per 1000 population in 2014/15 to 96.4 per 1000 population in 2019/20 (Statista Research Department, 2021). Home robbery was the second most prevalent household crime in South Africa which was in decline between 2015 and 2019, from 506 000 to 415 000 respectively (Statistics South Africa P0341, 2019).

2.3.3.3 Political Push and Pull Factors

Political factors have for a long time, played a critical role in influencing individual's decision or desires to emigrate, from the Polish "Great Emigration" in the 1830's following the defeat of the November Insurrection to more recently to the massive emigration experienced in Eritrea since the 1950's due to war and a lack of freedom (Kuligowski, 2020; Belloni, 2019). A study by Eagar (2008) and My Broadband (2019) showed that a political and economic uncertainty, due to a lack of confidence in the South African government, played a role in the decision of South African engineers from various industries and Information Technology (IT) professionals played a role in their desire to emigrate. Figure 2.13 and Figure 2.14 shows the results for the studies from the Eagar (2008) and the My Broadband (2019) respectively, where the participants were was asked to rate the importance of each aspect is when choosing a host destination for emigration, with 1 being "not important" and 5 being "very important". As seen from Figure 2.13 and Figure 2.14, political and economic, as well as person security concerns i.e., crime rates, were the main drivers while issues of Tax and Immigration policy were less instrumental in the decision making.

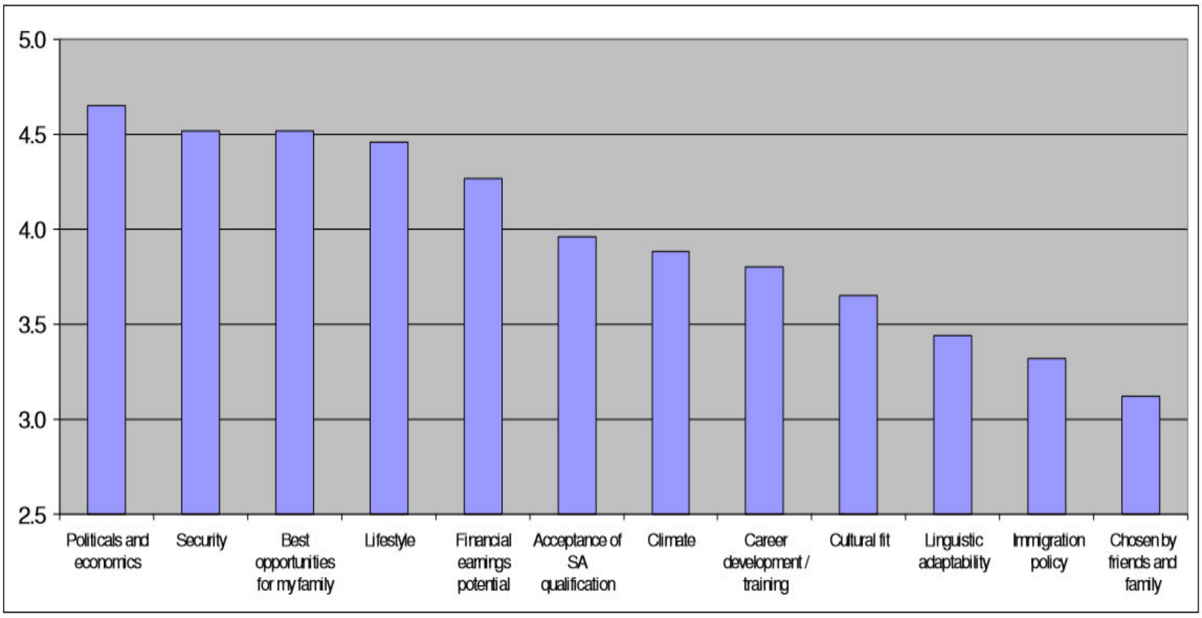


Figure 2.13: Criteria destination country selection by level of importance (Eagar 2008)

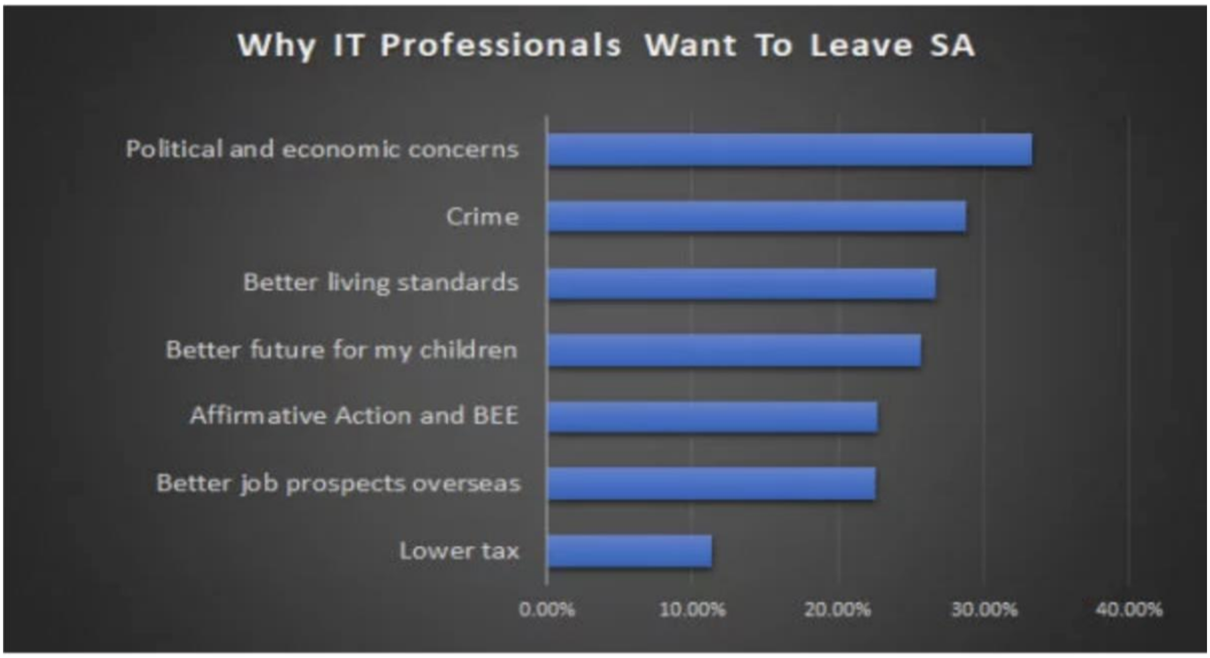


Figure 2.14: Main concerns that are pushing IT professionals to emigrate (Mybroadband 2019)

In the recent past, South African politics and poor governance from the ruling party has had a direct impact on the South African economy and society which has manifested in an erratic exchange rates, investment credit rating downgrades to full non-investment full junk status in March 2020 after the Moody's Rating Agency downgrade and unreliable power supply with repeated rolling power blackouts by the power utility parastatal Eskom, to prevent a collapse of the national power grid (Naidoo, 2020).

The impact of political on the South African Rand's (ZAR) depreciation and emigration trend is seen in 2015, where the sharp spike in emigration coincided with turbulent economic times in South Africa when the South African president at the time, Jacob Zuma, unexpectedly replaced the then Finance minister, Nhlanhle Nene, on the 9th of December 2015. This resulted in the ZAR plummeting to a record low at the time of $16.89 to the USD by the 27th of December 2015 and laid the foundation for the first downgrade to junk status by S&P Global Ratings and Fitch Ratings after another unexpected late-night cabinet reshuffle when the then president, Jacob Zuma, replaced the Finance Minister and his Deputy throwing South Africa into turmoil again (Naidoo, 2020; SA Reserve bank 2017; Letsoalo, 2015; Areff, 2015).
Much of South Africa's political instability has been due to intraparty conflict fuelled by factions within the ANC which has resulted in political assassinations of mostly ANC members and leaders (Mkhize, 2017; Savides, 2016). On the 8th of August 2017, South Africa's members of Parliament had the eighth vote of no confidence in President Jacob Zuma, by secret ballot, which he survived by having 189 votes which were more than the 177 votes that supported the motion of no confidence (Nkosi, 2017). The decision by the Speaker of the National Assembly, Ms. Baleka Mbete, to allow the vote to be by secret ballot further divided the ANC as some ANC members of parliament voted in supported of the motion with the opposition parties (Davis, 2017; Nkosi, 2017). The current intraparty fractional conflict within the ANC ruling party does not bode well for political stability in South Africa. The lingering effects of decade long poor political leadership and governance has continued to negatively impacted service delivery and economic growth under the new administration, resulted in recurring social unrest expressed through service delivery protest with Gauteng, Kwazulu-Natal, and the Western Cape recording 24%, 21% and 19% of the total service delivery protests in 2019 (Njilo 2020).

2.3.2 Work Environment

The Millennial Generation

Like people, generations have personalities, and the Millennial generation is no different. Millennials, often referred to as Generation Y, became adults at the beginning of the new millennium - the final two decades of the 20th century. Even though they were initially named Generation Y or Generation Next because, they came after Generation X who were born between the 1960 and 1980, the term Millennials has gain prominence over Generation Y and Generation Next (Main, 2021) Millennials are distinguished by the fact that they were born at the end of the previous millennium and were born between 1981 and 1996. This means that anyone who is born from 1997 onwards is now part of the next generation Gen Z. The world we currently live in has undergone a technological revolution during the youth and adolescence of the millennial generation.

The Millennial Takeover

The Gen X and Millennials generations are rapidly replacing Baby Boomers as the next leaders of businesses and management. The way work and business are conducted around the world has been significantly impacted by millennials, from shorter work hours and less unpaid overtime to company perks like free gym memberships, in-office snack bars, and even nap pods to help increase productivity during daytime work hours. They, Millennials, have a unique set characteristics and expectations that need to be embraced by the modern-day organisations to earn their loyalty (Fuscaldo, 2023; Human Resources MBA, 2017). Millennials now make up more than one-third of the United States of America workforce and play a vital role in propelling the economy forward. Although a significant portion of the workforce is made up of millennials (those born between the early 1980s to the early 1990s), they don't always seem to be loyal to the organisations and bosses they work for and readily job hop if they are not happy with their current role of work environment. As employee retention rates decline, multinational organisations are observing higher turnover rates among millennials (Fuscaldo, 2023; British Council, 2019).

Millennials and the Digital Age

Millennials came of age at the same time when the technological advancements rapidly came into fruition, which has had a major influence on many aspects of daily to day life for millennials. The rapid technological advancements, it difficult to identify the specific traits that the millennials have in common but the main events that shape history. For example, the advancement of the internet, economic crisis, natural disasters, mass shootings etc. have an impacted everyone, but the more impressionable younger persons are typically more affected since they are still shaping their beliefs and aspirations. Being at the forefront of the digital age, millennials are proficient with regards to using technology and use smartphones, notebooks, and tablets to manage their lives. Studies shown that the impact of world events and societal advancements on the younger person of a generation extends well into their adult life rather than only affecting them when they are young (Nielsen, 2021; Dimock, 2019; Ferrer, 2018).

As observed by researchers Main (2021), Nielson (2021) and Ferrer (2018), the following traits and characteristics of Millnials are that:

(i) Millennials are adaptable and quickly accept change: Millennials have witnessed a major change in technology, the economy, and industry during their lifetimes. They've learned that nothing remains the same for very long in life and have accepted that reality.

(ii) Millennials are curious: they want to know whether there is a more efficient way to complete a task. They'll make use of the tools at their disposal to boost their efficiency. Researchers claim that this quality makes them desirable employees. The fact that many young people have other grownup ambitions, including getting a decent education and being financially secure, has contributed to this tendency. The Millennial generation is the most educated in human history. This is largely a product of the demands of a modern knowledge-based economy, but it is also a result of the fact that many of them decide to pursue further education considering the challenges associated with finding job both during and after the financial crisis.

(iii) The Millennial generation values teamwork and appreciates working in environments where they may solicit the opinions and input of others. Therefore, Millennials are a generation that is more connected than previous generations and heavily utilizes modern digital technology. Additionally, they use social media more frequently. Their urge to interact with people on social media influences their use of it (often in real time). Digital connections are frequently linked to other forms of communication for many people. Their deep love of technology has given them a variety of attitudes and behaviours that, for the time being at least, make them distinctive from other generations, such their need for immediacy.

(iv) Millennials value critique and or constructive criticism and appreciate the importance efficient feedback in the workplace. In addition to asking for advice and constructive criticism, this generation also values praise for a job well done and positive criticism. Events that have shaped their generation's historical period have an impact on their choices, views, values, and their future expectations. This generation is well educated and possesses a strong aptitude for adapting to new technology, making them well-suited to confront the future even though their youth's economic environment was not entirely favourable.

Millennials Ganging the Work Landscape

According to the British Council (2019), more than 40,000 responses from millennials were gathered as part of a PricewaterhouseCoopers (PwC) global survey about workplace culture, communication and working styles, pay structure, career development, work-life balance, etc. And more than 10,000 millennials took part in a separate global survey by Deloitte to answer questions about how they view the dangers and opportunities in the complex world of work. The key findings from these two research surveys and questionnaires were that:

- Millennials are just as dedicated to their jobs as their more experienced co-workers.
- Millennials need flexibility in their working hours and are prepared to forgo income raises and promotions in exchange for it. They contend that productivity, not the number of hours spent in an office, should be used to determine success.
- A healthy work-life balance and exciting work are important to millennials. They don't think making sacrifices in their personal lives for excessive work demands is worthwhile.
- Millennials desire greater chances to advance their careers. These encompass interpersonal, collaboration, and technology competencies.
- Millennials desire a sense of support and admiration from their employers and superiors.
- Millennials choose companies with high ethical standards because they think that firms and business leaders should work to better society.

Employers need to figure out what kind of pay, benefits, praise, or other incentives will appeal to Millennial workers when they enter the workforce. If these demands are met well, employee productivity and morale will rise. There will also be a rise in long-term employee retention (Shele, Bannon et. al., 2011).

According to Fuscaldo (2023) and Human Resources MBA (2017) millennials are changing the workplace in the following ways:

(i) Trust and Transparency. Millennials are transforming the way organisations communicated with their employees in that the communication is now more open sand transparent. The days of communication on a “need to know basis” are in the past because Millennials demand to be kept abreast of significant events that take place in the organisation to avoid being caught off guard by change. Transparency is extremely important to millennials, in both the workplace and politics. Their greater expectation of openness from the management and executive teams of the organisations they work for has had a big impact. They desire interconnectedness and accountability throughout the organisations they work which has fundamentally changed the relationship organisation have with its employees.

(ii) Remote Work and Flexible Working Hours: Remote working is a trend which has gained prominence among the tech savvy Millennials since the start of the COVID-19 pandemic. For a few years before the COVID-19 pandemic, Millennials expressed their desire for better work-life balance by integrating their professional and personal lives and working from home when they would like to do so. For the years leading up to the pandemic organisations were opposed to the idea of remote working for fear of losing control and drop in productivity and were thus insistent on the requirement to work from the office from 9am – 5pm. What organisations failed to realize is that Millennials work differently compared to the Gen X and Baby Boomers generations in that they judge accountability and productivity by the quantifiable target being achieved and not the number of hours spent behind the desk at the office.

Today, post COVID-19 pandemic, many employees who are now accustomed to working from home to so with ease and expect to continue doing so going forward. Millennials make up most of these remote workers. Research from Slack found that 72% of workers wanted to continue working remotely through a hybrid model that combines office work and remote work, with only 12% wanting to return to the office. This is like the findings from CIPD (2019) conducted across multiple sectors which revealed that 87% of the participants across all ages and gender desired greater work flexibility. For the Millennials, Gen Z and future generations, the more flexible organisations are in terms of remote working, the greater the loyalty they will receive from these generations.

(iii) Experience over Formal Degrees. Despite being one of the generations with the highest levels of education now, millennials are also the generation with the highest levels of student loan debt. As a result, they now view college degrees differently from the previous generations i.e., as something that is good to have but not essential for success. In management roles, millennials are more inclined to hire people based on their talents, experience, and track record than ever before.

Work-Life Balance: Many millennials grew up watching their parents live for work, giving all their time and loyalty to their company only for them to lose their jobs overnight due an economic crisis, or premature death which has influenced their views of work and life. In short, Millennials don't live to work; they work to live. The expectations of millennials in the workplace are that their work will not consume all their free time. They also don’t work for free in that, that they are not willing to work unpaid overtime and they that their managers to provide the resources they need to complete the tasks that must be completed during the workday before they leave the office at the end of the workday. This is because millennial employees crave to have balance between their work and personal lives and as a result many choose flexible hours and the ability to spend time with family and friends over a high salary. They do not want to live the life their parents lived.

(iv) Technological Adaptation: Since most Millennials were born just before the Digital Age, and grew up around technology, they are very tech-savvy. They use a variety of tools to communicate, plan and achieve goals, and finish work, and are more likely than any other generation to be early adopters of technical services and goods. The technology revolution in the workplace is being led by millennials, who have made it possible for entire enterprises to be well-connected without even having to be in the same building, let alone the same city or nation because they prefer communication through email and messaging apps over face-to-face meetings and phone calls, and they are ready and willing to try new technology and applications. Companies run by Gen Xers and Millennials are known for their substantial reliance on technology and innovation to speed up team integration and smooth up workflows. Millennials are revolutionising the workplace in numerous ways as the new century develops, and they will set the standard for many future generations in terms of what they may expect from their workplaces, their careers, and their company leadership

Millennials have a fundamentally different view about work then the prior generations in that they see their current employee as a steppingstone and a chance for personal development. Even though they may be seen as a lazy generation, this is far from the truth because they simply give their attention more to things that interest them which highlight the importance of their work having to be interesting enough to keep them engaged and to bring out the best in them. While working for an organisation that is fun, innovative, and enjoyable work culture is important for Millennials, they do place a higher weight to a company that has good benefits, and that will provide for their learning, professional advancement, and personal growth. While salary matters to Millennials, like it does to all other employees from other generation, it is not one of their top five considerations when applying for jobs. This is surprising observation considering the significant student loan debt, millennials today have which may explain why +/-50% of Millennials stated they would be open to accepting a job at a different business in exchange for a rise of 20%. It makes sense that they would look for jobs that would maximise their qualifications and pay more.

It imperative for organisations to be aware that Millennials often place a higher emphasis on other employment characteristics, such as learning and progression. Understanding what drives millennials, what doesn't, and how to strike a balance between the two is crucial for organisation success in the current competitive market (Rigoni and Adkins, 2017).

2.3.3 Work Motivation

Motivation and self-determination can be defined as the process whereby an individual is driven to achieve a goal or target emanating from an unseen, internal psychological or physiological need and/or a desire to grow and is maintained when the individual the perceives fulfilment of three psychological needs: Autonomy, competence, and relatedness. (Alam et al., 2021; Angriani, Ariffin, and Rahmawati, 2017). The work by Lazarides, Buchholtz and Rubch (2018), showed that employees who were intrinsically motivated performed better, had greater enthusiasm, had a higher productivity, and contributed positively to national growth. Also, that extrinsic motivations resulted in instrumental actions that come to fruition because of their outcomes, like a higher quality of life, access to natural resources or averting a natural disaster.

Luthans (1998) states that work motivation has various approaches, for example, the content approach, process approach and contemporary approach, which each contain various work motivation theories. The motivation theory is one of many theories used by researchers and academics to explain why employees leave employers and is said to be one of the key factors that contribute employee satisfaction and retention, even though the relationship may between motivation and turnover may not quantifiable. Some of these motivation theories include Maslow’s theory which is based on the hierarchy of needs, Herzberg’s two-factor motivation theory, Vroom's Expectancy Theory, Adams Equity Theory as well as Kelly and Rotter’s Locus of Control Theory (Deri, Zaazie and Bazaanah, 2021).

2.3.3.1 Content Approach to Work Motivation

The content approach identifies needs to explain motivational factors and the resultant behaviours directed towards satisfying those needs. This approach believes that an employee’s whose needs are satisfied will inherently be motivated. The major theories in this approach are Maslow’s hierarchy of needs and Hertzberg’s two factor approach to work motivation.

Maslow’s Hierarchy of Need:

The seminal work on motivational theory by American Psychologist, Abraham Maslow (as cited in Gomes and Proenca, 2015), developed the hierarchy of needs motivational theory which is a five-tier hierarchical model of human needs, often shown in the form of a multilevel pyramid, as shown in Figure 15. Maslow realized that people have different needs that vary in importance and that human beings will fulfil the physiological needs like food and sleep first, which are at the bottom of the pyramid, before being motivated to fulfil the higher-level needs which are located at the top of the pyramid. Figure 2.15 shows the 5 levels in the Maslow’s hierarchy of needs that apply to the individual (Zainal, Ramly, Mutis, and Arafah - as cited in Aisyah, Mursalin and Octaviani, 2020; Singh, 2017; McLeod, 2016; Luthans, 1998):

- Physiological needs: These needs are primary, unlearned, basic human needs that deal with survival and sustenance, for example air, food, water, sex, sleep, shelter, and warmth.
- Safety needs: These need deal with physical and emotional safety and security, for example, shelter that offers protection from the elements, security through law and order and living without fear.
- Love/Belonging needs: These needs deal with social aspect of human being like affiliations in the form of friends and social groups, fellowship, affection experienced in intimate relationships, acceptance, and trust.

- Esteem needs: This need deals with self-confidence, mastery, notoriety, achievement, status, self-esteem, and respect from others. For example, achieving a personal goal, professional registration, post graduate qualification or successfully completing a project.
- Self-actualization: This is the highest need on the pyramid. It deals with reaching one's full potential and achieving self-fulfilment in all activities that are important based on their own inspiration and having the ability to transform self-concept into reality. These people are fully developed and fully evolved.

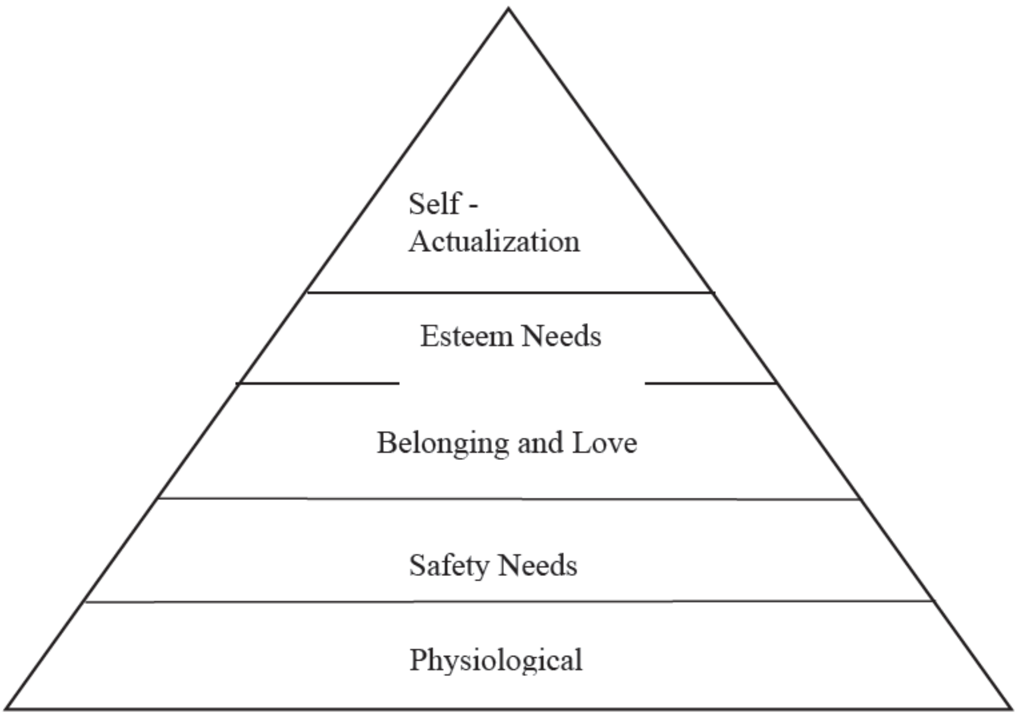


Figure 2.15: Maslow's hierarchy of needs (Maslow 1943, 1954 – cited in McLeod, 2016)

As can be seen from Figure 2.15, the two lowest needs i.e., physiological and safety needs, are basic needs emanating from deficiency and the desire to survive. The top three highest needs emanating from a need to grow, where belonging and esteem are psychologically driven and self-actualization is driven by self-fulfilment and peak experiences (Zainal et al., 2019; McLeod, 2016; Luthans, 1998). The seminal work of McGregor (1957) adapted the Maslow's ground-breaking hierarchy of needs motivation theory and applied it work-motivation. According to McGregor's work

(Alden, 2012). Maslow's hierarchy of needs could be adapted to the workplace in the following way:

- Physiological needs: These include basic salary, a cafeteria, rest periods, water fountains and vending machines.
- Safety needs: These needs include job security, favouritism or discrimination, labour unions, fringe benefits (housing allowance, car allowance etc.), medical aid, pension, employee assistance programs, job descriptions, consistent administration of policies like the employee grievance procedure, for example.
- Love/Belonging needs: These needs include creating work groups and teams (formal and informal), creating a team spirit, and encouraging social integration by arrange social activities outside of work.
- Esteem needs: This need includes ensuring that the work is challenges through effective work design, competence, acquiring of knowledge through training, employee engagement programs and showing appreciation to employees for good work through praise, awards ceremonies, rewards, and promotions.
- Self-actualization: This need ensures that the employee experiences personal growth through self-development, challenging work assignments like leading a project and reaching their full potential. Like Maslow's theory, McGregor's adaptation also has the fundamental view that as soon as man's lower, physiological, needs are met, he will be motivated to meet the higher-level needs like safety, love, and esteem (Singh, 2017; McGregor - as cited in Alden, 2012). It is important to note that even though every person has the capability to move up the hierarchy to attain self-actualisation, only one in one hundred people will reach the level of self-actualisation because society judges mostly on the psychological needs of belonging and esteem.

Furthermore, life experiences like, loss of employment, divorce, death of a spouse can cause individual to move back and forth between the different levels of the need's hierarchy (Maslow 1943, 1945 cited in McLeod, 2016). Maslow, in 1790, further increased the hierarchy of needs pyramid from a five-tier to an eight-tier pyramid which included levels for cognitive needs, aesthetic needs and transcendence, as shown in Figure 2.16. According to Maslow (1970a) cognitive needs level addresses impulses such as the desire to learn and attain pure knowledge and understanding, whether it be a philosophical or theological, to have enough insight to explain and systematically comprehending the universe while the aesthetic needs deal with aspects, inter alia, structure, precision, symmetry, order, elegance, simplicity, and the need to forge towards completion. Maslow (1790b – cited in McLeod, 2016) further expands on transcendence needs as the desire to help others reach their full potential, a level of full development, and of uniting those who are divided whether it be as a teacher, politician, or a poet.

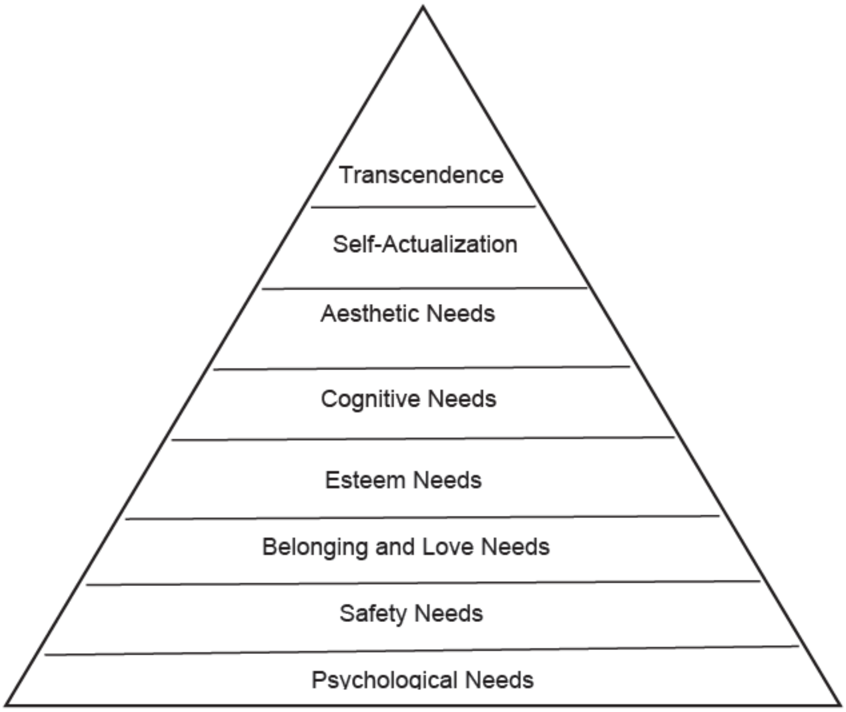


Figure 2.16: Maslow's expanded hierarchy of needs (Maslow 1970 – cited in McLeod, 2016)

Hertzberg Two Factor Theory

The seminal research of Hertzberg's two factor theory of satisfaction and motivation has been at the core of the work redesign theories that have shaped the workplace (Luthans, 1998; Herzberg 1966 – cited in Hackman and Oldham, 1976; Herzberg, Mausner, and Snyderman, 1959). Hertzberg theory is comprised of two dimensions which are the hygiene and motivator factors. The hygiene factors, also known as extrinsic factors, are the aspects of the workplace like the working environment, salary, management, punishment, career advancement and company policies (Ruthankoon and Ogunlana - as cited in Deri, Zaazie and Bazaanah, 2021).

The work of Onuoha et al., (2016) on healthcare workers in Trinidad and Tobago supports Hertzberg's theory that hygiene factors that cause dissatisfaction, do not lead to employee motivation nor does do they inspire towards superior performance when they are resolved or removed, but do contribute to negative attitudes among employees (Gomes and Proenca, 2015). Whereas the motivator factors, also known as intrinsic factors, like achievement, recognition, responsibility, job security, interpersonal work relationships, personal growth, competence, and job content create employee satisfaction and motivation leading to superior performance (Deri et al*.,* 2021; Onuoha et al*.,* 2016; Yeatts and Hyten 1998; Luthans 1998).

2.3.3.2 Process Approach to Work Motivation

The essence of this approach centres around expectancy with the major theories being Vroom's expectancy/valence theory and Lawler's effort-performance expectancy and performance-outcome theory.

Vrooms Expectancy Theory

The seminal work of Vroom's (1964) motivation theory is based on 3 important concepts i.e., Expectancy, Instrumentality and Valence where:

- Expectancy (E) is the relationship between effort and performance and deals with the probability that the effort that the employee is willing to put will result in achieving the desired first level outcome. For example, working longer hours resulting in a higher output and superior performance.

- Instrumentality (I) builds on expectancy and relates performance (attained as the first level outcome) to the probability of the first level outcome. For example, a higher performance resulting in a reward like a salary raise or performance bonus (second level outcome). Valence (V) is the relationship between an employee's desired outcome and their personal goals and/or the desired outcomes fulfils an important need. The valence is positive where the employee desires a positive outcome, for example career advancement, satisfaction, time off etc. The valance can be negative where the employees anticipate a negative outcome, for example fatigue or stress, or it can be zero where the employees is indifferent about the outcome. (Parijat and Bagga, 2014; Vroom, 1964)

Unlike the content approaches to motivation found in the work of Maslow and Hertzberg Vrooms theory does not prescribe a set of generic variables or factors that affect employee motivation (Luthans 1998). Vroom's theory highlights the importance of a managers need to understand what is important to their employees to enable them to better align the company goals to the goals of the individual employees. After understanding the employee's first and second level outcomes, the manager then needs to understand the employees' beliefs about whether their first level outcomes are attainable or not, or whether the achievement of the first level outcomes are instrumental to achieving the second level outcomes like money, satisfaction, security, recognition etc. (Parijat and Bagga, 2014; Luthans 1998). The employee's motivational force can be calculated through the following equation,

Motivation= E x I x V…………………………………………………………………. (1)

This equation can be used to predict employee attrition, job satisfaction and an employee commitment where the value of expectancy will vary between 0 and 1, the value of instrumentality is between 0 and 1 and the value of valence varying between -1 to +1 (Parijat and Bagga, 2014)

Lawler's Effort-Performance Expectancy Theory

The belief that lies at the core of pay-for-performance or incentives schemes is that the performance of employees will increase, and sustained, when it is linked to financial compensation (Heneman and Werner, 2005; Lawler, 2005; Banker, Lee, Potter, and Srinivasan, 2001).

Studies by Denton (1991, as cited in Schuldes, 2006) and Mirabella (1999) showing that employee productivity increased when employees received rewards for the meeting performance targets that resulted in an organisational increase in production. It is important to ensure that appropriate and accurate measures are used to evaluate employee performance to determine their reward because, ineffective pay-for-performance plans which fail to accurately and/or differentially reward based on performance can lead to demotivation of high performers resulting causing harm to the organisation instead of the intended good (Heneman and Werner, 2005; Perry, 1995; Milkovich and Wigdor, 1991). When ineffectively executed, the benefits provided by merit systems are outweighed by the effort required to resolve problems emanating from merit reward systems (Beer, Spector, Mills and Walton, 1984). On the other hand, when implemented effectively pay-for-performance plans can achieve and sustain increased organisational performance through (Dee and Wyckoff, 2013; Banker et al., 2001):

(i) Attracting and retaining productive employees and conversely resulting in the less productive employees to leave the organisation i.e., the selection effect.

(ii) Leading or persuading employees to increase and/or optimize the effort they put into their work by investigating and discovering more efficient ways to execute their work i.e., effort effect.

The resultant effect of performance incentives schemes or plans is that the low performing employees either resign or improve their performance, while leave while the top performing employees further improve their performance (Dee and Wyckoff, 2013). Incentive schemes should be viewed in the context of other motivation theories, for example Vroom (1964), and Maslow (1943), in that pay-for-performance plans will motivate for employees who believe that their effort will result in attainment of the incentive they value, who require physiological and/or safety needs to me met. Pay-for-performance plans to result in increased performance, it is essential that the targets set are realistic and attainable because employees won’t increase their effort if they believe the set targets are unattainable (Vroom, 1964). Pay-for-performance plans can focus on individual performance, team performance or organisational performance (Heneman and Gresham, 1998).

Dodge (2020) advises that businesses adopt a recognition and rewards strategy to motivate employees that involves a combination of monetary and non-monetary benefits in the employee appreciation initiatives. Appreciating employees' efforts throughout the year will improve employee engagement and put the focus on employee innovation to contribute to achieving organisational goals. Other incentive programs, in addition to the traditional performance appraisal process, have been used to spark innovation and creativity that directly benefit the company. For example, some companies use gain sharing techniques by rewarding employee suggestions that result in cost saving and/or revenue increase with the reward being proportionately to the resultant monetary saving or revenue increase after the idea has been implemented (Heneman and Werner, 2005; Heneman and Gresham, 1998). Whichever employee incentivisation strategy the organisation chooses to follow; it is important that it encompasses the below three elements:

Dodge (2020) and Robbins (2019) Basumallik (2021) state that a good employee rewards program should touch on appreciation, recognition, and compensation to be the most effective. Employee recognition is defined as the act of formally acknowledging the employees of an organisation for good or exemplary performance. Appreciation is important for an employee to know what their extra efforts is noticed and stand out from that of the larger workface. The intended purpose and end goals of employee appreciation and recognition is to encourage desired behaviours and attitudes, practices, ethics that contribute to the attainment of the organisation's goals. Recognition and appreciation are therefore commonly used to acknowledge the extra efforts by employees whether it be due to completion of a successful project or commitment in their day-to-day work activities. It can be given in an informal way through a thank you note, or a vernal thank you or it can be expressed in a formal way through compensation or an award.

Individual Performance Appraisals

The individual performance appraisal is a review held to evaluate an employee's job performance and contribution to the organisation's objectives over a specified period to reward high performers. The employee performance appraisals are also known as performance reviews, annual reviews, performance evaluations etc. The most common approach for conducting the performance appraisals (PA) is for the immediate manager(s) to evaluate their direct subordinates through a rating system which is then used to rewarded through merit pay increases, sales commission, and skill-based pay increases. The performance appraisal should not only be used to judge past performance but should also be used to provide constructive feedback and to communicate and outline the future job targets and expectations (Laurinavicius, 2023; Hayes, 2022;). These performance appraisals are also opportune time for discussion and alignment on any roadblocks that prevent job progress or threaten achieving the planned targets, personal growth, career progression opportunities and training. While career progression is often touched on in the performance appraisal, at article by Li (2020) referencing a Gallup study showed that only 14% of employees felt that the performance appraisals contributed to their professional development.

Various studies, like the one Lira et al., (2016) have shown that, if done regularly (usually biannually), correctly and fairly, the performance review process will serve its main purpose which is to:

Formally acknowledge the positive contributions made by the employees throughout the year or up to that point in time.

- Motivate the employees to perform well and increase their productivity.
- Increase employee engagement because employees will have great clarity on expectations within their roles, level of responsibility and accountability.
- Go through each of the key performance indicators and evaluate how well or to what extent they have been met.
- Provide constructive feedback to on their strengths and areas of improvement that they need to work on, and to put in place measures to support them.
- Set the goals and targets for the next year and agree on the expectations with regards to employee performance.

- Discuss with the employee about any aspects of their job and or work environment that they are dissatisfied with.

- Document employee performance for future promotions opportunities.

- Increase employee engagement which will in turn help to reduce the staff turnover and enhance the employee-manager relationship.

The sobering reality about performance rankings that if done incorrectly and or unfairly, it can negatively affect the employee's self-esteem and loyalty when their ratings are employee's expectations (Perry, 1995). Perry (1995) further states:

> "Most merit pay systems are designed to reward individual rather than group performance. Thus, merit pay systems tend to separate employees into two classes, 'stars' and 'also rans'. Unfortunately, far more employees fall into the 'also ran' category simply because of the need to limit the number of employees rated outstanding. Consequently, merit pay may damage the self-esteem and loyalty of numbers of employees."

Furthermore, the findings from the work done by Perry (1995) were consistent with those from Lira et al., (2016), who investigated the impact the Integrated System of Performance Management and Appraisal in the Public Sector (SIADAP) had on the Portuguese civil servants, and Banerjee and Krishnam (2018) which revealed that unfairness in the performance appraisal process had a deleterious effect on employee motivation. In addition to employee demotivation the findings also revealed a high attrition rate as consequence of employee dissatisfaction. While the intentions of the performance management review process are noble in that it seeks to reward deserving employees, it rarely achieved this intended purpose. This because historically the effectiveness of the PA process was measured only by its accuracy and reducing rater bias and not on how the employee felt about the performance appraisal outcome i.e., do they feel the process was evaluation process was fair, do they accept appraisal result, and whether they willing to work on the identified areas of improvement in the forthcoming work cycle (Van Dijk and Schodl, 2015). The findings from Lira et al., (2016) were aligned to those of Van Dijk and Schodl (2015) showing that the employee motivation and the desire to improve job performance relied heavily on the employee having the following perceptions about the performance appraisal process:

- That the appraisal process was accurate.
- That the appraisal process was free from manager bias.
- That the appraisal process is reliable and fair.
- That the appraisal process allowed for their views and voices to be heard.

The above findings show that the PA can only achieve its main purpose when employee reactions are measured in addition to measuring the accuracy of the PA process. According to Hayes (2022), employee dissatisfaction can stem from one or more of the below reasons:

(i) A lack of trust in the integrity of the appraisal system can lead to a perceived power imbalance between manager and subordinate, which can result the subordinate doing only what the manager desires and customizing their performance appraisal accordingly.

(ii) An unbalanced power dynamic between manager and subordinate can lead to setting of unrealistic goals that are not achievable with the allocated time and or resources, which can lead to the subordinate delivery poor quality, substandard work or engaging in ethically compromising practices to meet the targets that have been set.

(iii) The PA and rewards process can be used as tool for managing relationships by managers, where some of the below scenarios can prevail:

  - o Underperforming and disagreeable staff can be rewards to ensure cordial and pleasant relationships are maintained.
  - o The subordinates who please the manager get rewarded with good ratings irrespective of their performance because, they are likeable.

- The subordinates who often refuse to do follow instructions, which at times are questionable ethically, get punished through being given a poor rating irrespective of their performance.
- Inherent manager bias based on gender, ethnicity, race, age all can result in an unfair performance rating.

Disgruntled and dissatisfied employees may start exhibiting counter productive work behaviours (CWB) that will negatively impact organisational performance.

Team Performance Rewards

Team performance rewards are used when evaluating individual performance is difficult due to interdependent employee tasks and can be done through team recognition, as well as monetary and non-monetary incentives (Heneman and Gresham, 1998; Milkovich and Wigdor, 1991).

Employee Salary

A study on employee salary system preferences by Schuldes (2006) showed that employees with an educational background had a strong preference for salaries based on educational level, which is expected once the costs of educational investment i.e., time and money, is taken into consideration. For employees who feel they have a poor base salary, an increase in internal employee motivation, self-esteem and performance may be achieved by a base salary increase instead of a pay-for-performance plan (Kuvaas, 2006; Gardner, Van Dyne and Pierce, 2004). The work of Judge, Piccolo, Podsakoff, Shaw and Rich (2010) however showed that even though an employee's performance be elevated by better pay doesn't necessarily lead to job satisfaction because, the relation between salary level and job satisfaction is positive but weak i.e., the high earning employees within an organisation were only a little more satisfied than the relatively poorly paid employees. As described in Maslow's hierarchy of needs theory (1943; 1945), a good salary does however provide access to an enhanced quality of life by enabling employees to better meet their basic physiological needs like a home, a car, private healthcare, and quality education for their children. The work of Deri et al. (2021) on the other hand showed that employees whose salary is too low to meet their economic needs and who and minimal opportunities for advancement are more like to leave the company.

Performance Evaluation Methods

This section will discuss some of the modern methods that organisations use to evaluate the performance of the employees.

Individual Performance Evaluation

Banerjee and Krishnam (2018) elaborate on some of the modern individual performance appraisal (IPA) methods organisations use to measure the performance of the employees. These can be used as the sole PA method, or they can be used in combinations with each other. The main emerging modern individual PA methods are:

(i) The 360-degree feedback system
(ii) The Management by Objectives

360-degree Feedback

This employee appraisal method uses multiple sources (individuals) at different levels in the organisation to provide feedback an employee. For example, self-appraisals where the employees rate their own performance, appraisals from colleagues, appraisals from direct line managers and superiors, and appraisals from subordinates. The 360-degree appraisal system is flexible and simplistic in that it can be done through electronic surveys and can be done multiple times throughout the year at any point in time i.e., it does not have to have to be annually or bi-annually. It is also a useful system to measure prevailing perceptions that the employees have especially on managers to measure overall organisational health in terms of effective and fair management to strengthen justice within the organisation i.e., procedural justice, distributive justice, and interactional justice (Hayes 2022; Banerjee and Krishnam, 2018; Van Dijk and Schodl, 2015).

Management by Objectives

This appraisal method uses a collaborative approach where the rater and the ratee jointly set the targets to be achieved by the of appraisal period. This approach allows the employee to be actively involved in the goal setting, increasing their moral and serves serving motivation to achieve the goals because the is good alignment and clarity on the goals from the onset. At agreed time intervals, the employee performance will be evaluated based on the agreed targets. Various models and processes can be employed to conduct employee performance appraisals. Though the performance appraisal methods may differ slightly during implementation, Pattanayak (as cited in Banerjee and Krishnam, 2018) proposes that the general PA process encompasses the below steps:

Step 1: Setting the performance targets:

The first step of the performance appraisal step is to set the desired goals and targets for the assessment period. This must be done prior to comparing the real performance of the personnel. Setting the performance goals and targets is a necessary step to determining whether an employee's performance meets or falls short of the agreed targets. The targets that have been set and agreed upon must be SMART i.e., specific in that they must be plan simple, measurable, achievable, realistic and time bound, which is usually over the duration of the assessment period.

Step 2: Communicating the targets that have been set:

This step involves the communication of the targets to the appraiser or rater and the appraisee aka as the ratee. The appraiser is the person conducting the appraisal whereas the appraisee is the person whose performance is being evaluated. It is important for both the appraiser and the appraisee to understand the organisational targets and how their contribution through achieving their individual targets will assist the wider organisation to achieve it’s set targets. This early clarity and alignment about the expected deliverables, and the key performance indicators that will be used to measure actual performance is of utmost importance because, it is in this step that any appraisee feedback on the will be taken into consideration to ensure the targets are SMART.

Step 3: Measuring the actual performance over duration of the assessment period:

After the desired targets have been set, communicated and alignment reached between appraiser and appraisee, the next step is to measure actual performance from the appraisee over the assessment period. This is the most difficult step as it entails continual monitoring of the appraisee through various means like number of reports written, the amount of rework done (mistakes that needed correction), number of complaints received, number work units completed, observation to determine their attitude towards their work and overall commitment. The measurement tool will depend on the nature of the work, which highlights the importance to select the right measurement method because, a one size fits all approach for measuring employee performance will ineffective.

Step 4: Comparing actual performance with performance targets:

This fourth step of the performance appraisal process measures actual performance against the agree targets from step 1. This comparison between actual performance and desired performance is essential in ensuring that the employees are rewarded fairly for their contributions. The contrast between actual and desire performance will reveal whether the appraisee has met the agreed targets, whether they have underachieved by failing short of the targets or overachieved by surpassing the targets. It also allows the organisation to see the gaps in performance and adequately close them in the next PA cycle through various interventions like formal classroom training, on the job training, referring employees to the employee assistance program to receive the necessary support if a personal issue contributed to underperformance.

Step 5: Providing PA result feedback:
This step 5 of providing one-one-one feedback to the appraisee on the outcome of the appraisal is important to ensure cohesion within the team or organisation. This step involves discussion the results and analysing the shortcomings and finding possible solutions to close any existing gaps. This feedback is also an opportunity to appreciate

and congratulate the appraisee for targets that have achieved and surpassed. It is important for the appraise and appraiser to reach an agreement on the outcome to enable the employee to further enhance their future performance.

Step 6: Taking corrective or appreciative actions:

The fifth and final step of the performance appraisal process involves acting on the final outcomes of the appraisal. The type of action taken will be determined by the nature of the outcomes once known i.e., whether the appraisee overperformed, underperformed or met the targets. Some of the typical actions taken outcomes to close any shortfalls or gaps between actual and desired performance are training and development to close competency gaps, demotions for chronic underachievers, transfers where poor performance is linked to interpersonal issues between the employee and their line manager. The typical actions related to surpassing the targets and good performance are rewards in terms of a higher end year bonus, promotions, a lunch voucher, or company paid getaway (Dodge, 2020).

Organisational Performance Evaluation

Organisational Performance profit through sharing and shareholding are based on organisational financial performance i.e., profit. The downside of this rewards system based on organisational performance is that fact that employees are seldom able to relate or assess their contribution to the overall profit the organisation makes (Heneman and Gresham, 1998). A common system used to measure organisational performance is the Balanced Score Card (BSC)

The balanced score card is a corporate performance appraisal method to evaluate organisational performance. It is used as a tool for strategic planning to ensure alignment between organisations goals and its vision and strategy and to measure performance against the predefined goals. The balanced score card is often used in combination with an individual performance method, for example the 360-degree feedback or management by objectives, which provides a wholistic performance appraisal system that considers both individual performance and organisational performance (Banerjee and Krishnam, 2018).

2.3.3.3 Contemporary Approach to Work Motivation

The major theories under this approach are Adams' equity theory, Kelly, and Rotter's lotus of control theory and Job redesign.

Adam Equity Theory

According to the seminal work of Adams (1963) on inequity, employees will compare their work inputs variables organisational position and their outcomes with that of other employees and will seek to balance out any perceived inequity. As stated by Inuwa (2015) understanding the link between job satisfaction towards duties and responsibilities and the level of equity and fairness will assist managers to manage their subordinates and execute their responsibilities more effectively. Equity is only achieved when the ratio of outcomes over work input is equal to that of their co-workers where the work input over variables refers to things like experience, education, qualifications, loyalty, gender, work ethic etc. while the outcomes refer to things like remuneration, benefits, recognition, reputation, and respect (Inuwa, 2015; Luthans, 1998). Organisational justice and fairness are an important aspect of modern-day employment because this will ultimately spill over to the customers (Bowen, Gilliland, and Folger, 1999). Srivastava (2015) investigated the impact of four dimensions of justice described by Greenberg (1993) i.e., procedural justice, informational justice, distributive justice, and relational justice, on health-care professionals' job satisfaction and commitment where:

Procedural justice

This is the perception of the inherent fairness of the policies and procedures that drive decision making in the workplace. For example, were the views, feelings of the employees considered when the procedures were developed or were these just imposed on them without consultation (Greenberg, 1990; Thibaut and Walker, 1975). Procedural justice can be assessed on the following criteria: accuracy, consistency, the ability to be corrected, bias suppression, ethicality, and representativeness (Leventhal, Karuza, and Fry, 1980).

Distributive justice

The essence of distributive of justice is the perception of fair and consistent application and outcomes of applied organisational policies and procedures, whether it be during disciplinary action or during performance appraisals (Byrne and Cropanzano, 2001 – cited in Srivastava 2015; Cropanzano and Greenberg, 1997). Cropanzano and Greenberg (1997) further state that distributive justice is strongly influenced by both procedural justice and relational justice i.e., whether the procedures meet the criteria of fairness listed by Leventhal et al., (1980) and whether they were applied with sensitivity and respect (Bies and Moag, 1986). The perception of distribution justice in the workplace not only concerns policies and procedures but also the day-to-day activities like the distribution of work and responsibilities within a team, which can lead to work related stress (Lazarus and Launier, 1978).

Informational justice

Informational justice relates to the explanations and justifications given to an employee to clarify why procedures were applied in the way that they were (Greenberg 1990 – cited in Srivastava, 2015).

Relational justice

This dimension deals with the way that employees are treated when procedures and policies are applied, therefore, values like mutual respect, empathy, and sensitivity, disrespect and mistreatment therefore lie at the heart of relational justice (Bies and Moag, 1986). Later work by Erdogan, Liden and Kraimer (2006) reaffirmed that respect towards employee's strengthened relationship between a leader and their followers. Bies and Moag (1986) further state that the four cornerstones of relational justice to be: (i) A clear explanation and justification of decisions (ii) honesty and transparency (iii) appropriate questioning and voiding prejudicial statements (iv) respect. The work of Srivastava (2015) showed that only relational and procedural justice were positive predictors of job satisfaction while informational and distributive and justice were not positive predictors. With regards to organisational commitment, informational justice was the only positively predictor of while the other dimensions of justice were not.

Kelly and Rotter's Locus of Control Theory

The work of Rotter (1954, 1966) showed that the degree to which people believe they have control over situations in their lives is determined by the nature of their locus of control. A person with internal control believes that a situation or event is due to his own behaviour and/or characteristics. And that they have the power to change or influence situations and their outcomes while a person with an external control believes that they are powerless to change or influence situations and their outcomes are because of the complexity of the situation, fate, luck, or chance (Rotter 1966).
Various studies have shown that managers with internal control are better performers, are more strategic, prefer to adopt an inclusive management style to an autocratic style, are more considerate of employees and experience higher job satisfaction than externally controlled managers (Miller, Kets De Vries, and Toulouse, 1982; Mitchell, Smyser and Weed, 1975). When considering the employees, the employees with an internal locus of control preferred participative leaders over directive leaders while employees with external locus preferred directive leaders over participative leaders (Mitchell, Smyser and Weed, 1975 – cited in Bass and Bass, 2009).

Job Redesign

Studies have shown that job dissatisfaction to be detrimental to the organisation because it results in a high turnover and counter productive work behaviours. Some of these counter productive work behaviours include, the abuse of sick leave, taking longer lunch and tea breaks, transfer requests and withdrawal from the job through lack of engagement are some of the negative attitudes that disassociated workers have towards the job. While job satisfaction is the opposite of dissatisfaction and therefore results in a reduce turnover rate and a positive attitude towards the job (Irvine & Evans – as cited in Irshad, Yousaf and Usman, 2021; De Clerc 2020; Medina 2012; Spector et al., 2007; Trevor 2001).

Work redesign through job enrichment has been a prominent strategy for improving motivation, job satisfaction, productivity, and the general work life of employees in modern-day organisations (Luthans, 1998; Yeatts and Hyten, 1998). Modern day job enrichment has its foundations built on Hertzberg's two factor theory, for example achievement, recognition, personal growth as aforementioned and the job enlargement and job rotation strategies that ensured horizontal job scope growth resulting in reduced work specialization and reduced monotony respectively (Irshad, Yousaf and Usman, 2021; Luthans 1998).While some research studies showed that employees respond differently to enriched jobs, so using the motivation-hygiene theory as a blanket approach to employee motivation may not yield the desired results, other research studies showed that managers and employees both had similar views on employee needs and job satisfaction (Singh, 2017; Hulin - as cited in Yeatts and Hyten, 1998)

Job Enrichment, Enlargement and Rotation

To better understand the extent to which the individual's personality affected the effectiveness of job enrichment programs in improving employee motivation, Hackman, and Oldham (1976) developed a model which specified the conditions required for an individual to be internally motivated and to be a top achiever which they compared to other work redesign theories. Their model focused on the interaction of the following three variables:

(a) The psychological mindset required for internally motivated work behaviour to develop.
(b) The characteristics of the job that can create this psychological mindset.
(c) The various traits of individuals, for example, the need for growth, that determine their response to completing complex and challenging work-related tasks.

Their research revealed positive relationship between individuals with a need for growth, both high and low growth need, and their response to complex and challenging tasks, with individuals with the highest growth need reacting more positively than those with a lower need for growth. Hackman and Oldham (1976) in their work advised against a blanket approach when trying to improve employee motivation through increased job challenge as the benefit may not as much for the low growth need employees as compared to the high growth need employees. It is therefore important for managers to know their employee’s psychological mindsets, career, and personal aspiration, and to treat them fairly and respectfully for motivation strategies to have the maximum effect (Yeatts and Hyten, 1998; Hackman and Oldham, 1796).

2.3.4 Quality of Work life

The theory of quality of work life, which is focused on the overall workplace climate, has also gained prominence in recent years. The quality of work life (QWL) is a process where a worker’s economic, family life, social and work life needs are met by the company, which results in higher job satisfaction and productivity (Hasan and Misra, 2019). Research on quality of work life by Nadler and Lawler (1983) and further industrial examples like Volvo, the car manufacturing, showed that employee participation in organisational decision making and problem-solving enhanced employee performance, loyalty and commitment while reducing staff turnover and absenteeism (Luthans, 1998). The psychological impact of workers i.e., having social support structures to help cope with stress, is also essential to workers having superior quality of work life (Caron, Cargo, Daniel, and Liu – as cited in Hasan and Misra, 2019)

2.3.8.1 Mental-health and Work-Related Stress in the Workplace

Organisational work culture plays a major role on wellbeing of employees because the employee and the organisation are intimately connected. An organisation’s work culture encompasses aspects like the work atmosphere, interactions between colleagues, accountability etc. A positive work culture motivates employees, it improves their performance which helps the business become successful, while a negative work culture results in demotivated and often stressed employees (Aisyah, Mursalin, Octaviani, 2020). An employee’s mental health refers to their psychological and emotional well-being which effects their ability to use their cognitive skills to address day to day life demands, challenges, and stressful situations (Petroplan Oil, 2017; IDHS, 2009). Work-related stress can be defined as the situation where work demands being beyond that which the employees can cope with, which affects both the employee and the organisation. According to EASHW (2000) cited in EASHW (2002) and Petroplan Oil (2017), common employee stress triggers are poor work design and unrealistic expectations from managers which; on an individual level reveals itself in the following ways:

- Psychologically: Through burnout, inability to concentrate, insomnia, anxiety, depression, irritability and as poor family and work relationships.
- Health Problems: Through a weakened immune system, hypertensions, stress induced headaches and migraines, heart problems and peptic ulcers.
- Self-harm and behaviour: Using tobacco, alcohol or drug abuse, violence, bullying or harassment.

On an organisational level, stress and poor mental health in employees affects the organisation in the following ways:

- Poor Employee Engagement and Participation: High levels of staff absenteeism, poor timekeeping, ill-discipline, high staff attrition and turnover, aggressive intrapersonal communication.
- Poor Employee Performance: Low productivity levels resulting in reduced output, poor quality of product and/or service resulting in a loss of clients, poor decision-making and errors resulting in a high percentage rework or scrap.
- Increased Costs: Loss of working days, increased health care costs and referrals to health services.

The Petrochemical industry has stringent policies to ensure physical workplace safety, but it has not put enough emphasis on mental health as an aspect of workplace safety is it can lead to employees making mistakes that jeopardises the lives of others due to work-related stress and fatigue (Petroplan Oil, 2017). Work-related stress affected 22% of the work force in the European Union which makes it essential for Petrochemical, Oil and Gas firms to makes mental health support services available to their employees as this will benefit the company be the long term (Petroplan Oil, 2017, EASHW, 2002). Companies like Maersk and EDF Energy who have introduced employee assistance programmes to support their employees have resulted in improved job satisfaction and performance, higher employee retention and an improved work environment and culture (Petroplan Oil, 2017).

2.3.8.2 Employee Work Behaviours

Cognitive dissonance is the term used to describe any contradiction between two or more attitudes, or between conduct and attitudes (Saari and Judge, 2004). An attitude is any evaluation of something, people, or event that is either positive or negative. Trying to reduce dissonance is a goal for people. The significance of the factors causing the dissonance, the degree of control the person believes they have over the factor, and any potential rewards associated with the dissonance all affect their desire to lessen it. The relevance, connection to behaviour, accessibility, social pressure, and direct personal experience are the most potent mediators of the relationship between attitudes and behaviours. Understanding sentiments aids in behaviour prediction. Workplace attitudes that are important to employers include job satisfaction, job involvement, psychological empowerment, organisational commitment (affective commitment, continuation commitment, normative commitment), perceived organisational support, and employee engagement (Stone and Fernandez, 2008; Saari and Judge, 2004).

Job Satisfaction

A good attitude toward a job that results from an assessment of its qualities is called job satisfaction. The task itself, which has the largest association with overall satisfaction, is the initial cause of job satisfaction. Second, the social component: There is a significant association between this and how people perceive the social setting in which they work. The third factor is pay, which becomes unrelated once a person reaches a certain standard of life. The fourth one is corporate social responsibility. It benefits both the environment and people (Saari & Judge, 2004). The following are the effects of job dissatisfaction: departure, voice, loyalty, and neglect. Exit influences behaviour in favour of quitting the company. Voice involves making conscious efforts to change the situation for the better. Loyalty is waiting for things to get better while being passively optimistic. Neglect occurs when a worker idly permits circumstances to get worse. Job unhappiness indicates unproductive behaviour at work (Withey and Cooper, 1989).

The advantages of satisfaction include improved job and organisational performance, better organisational citizenship behaviours (OCBs - Discretionary behaviours that contribute to organisational effectiveness but are not part of employees' formal job descriptions), higher customer satisfaction levels, generally lower absenteeism, and turnover, as well as a decline in workplace deviance (Saari and Judge, 2004). The job satisfaction of employees has several consequences for managers, including paying attention to their job satisfaction levels as indicators of their performance, turnover, absenteeism, and withdrawal behaviours. To ascertain how employees are responding to their work, objectively and frequently gauge employee job attitudes. Assess the connection between the person's intrinsic job requirements and their professional interests to produce difficult and engaging work that will increase employee happiness. Consider the reality that a rewarding workplace is not likely to be produced by high compensation alone (Saari and Judge, 2004).

Counter Productive Work Behaviours

Employees who feel negative emotions are more likely to engage in deviant behaviour at work (Fox et al., 2001). Counter productive work behaviour is any employee behaviour that undermines the goals and interests of a business. Robbery, forgery, sexual misconduct, intimidation at work, truancy, public intoxication, violence at work, and sabotage are just a few examples of counter productive work practices. According to recent studies, ethical behaviour may be partially influenced by emotions and feelings. (Fox et al., 2001). Personality, time of day, day of the week, weather, stress, sleep, exercise, age, and sex are all potential sources of emotions. Some of these factors are discussed below:

- Personality: Different moods and emotions are experienced by different persons at different rates. Different intensities of the same emotions are referred to as affect intensity. The time of day has an impact on people's moods. The weekend is typically when people are at their happiest. Illusory link with the weather according to study, there is no effect.
- Stress: More stress makes emotions worse.

- Sleep: Lack of sleep makes it harder to make decisions and promotes negative feelings. Exercise: Slightly improves mood (Miller et al., 2007).
- Age: Negative feelings are less frequent in older people: Sex differences include more emotional expressiveness, more powerful emotional experiences, and more frequent emotional expression in women. It might result from socialization. The display of desired organisational emotions by an employee during interpersonal interactions at work is known as emotional labour. When a worker must display one emotion while also experiencing another, that situation is known as emotional dissonance. The person's genuine feelings are what they "felt." Displayed emotions are the taught feelings that an organisation expects its employees to exhibit and that it deems appropriate for a certain position. False emotions are concealed by surface acting.

Emotions and Feelings in the Workplace

According to display standards, deep acting entails attempting to alter one's emotions (Miller et al., 2007). Employees' emotional responses to events at work affect their job performance and job happiness, according to the Affective Events Theory (AET) (Mitchel, 2011). As stated earlier, people who are unhappy at work have a variety of options. They can ignore their work condition and concentrate on their interests outside of work (neglect). Through voice, they can try to make their circumstance better (voice). They could quit if they discover a better position (exit), or they can continue to be loyal and support the organisation (loyalty). A research study by Withey and Cooper (1989) presented the findings of two longitudinal studies that were undertaken to determine whether unsatisfied workers will express their displeasure by leaving the company, speaking up, remaining loyal, or remaining silent. The effectiveness of their reactions was what most affected loyalists, but surprisingly, loyalty resembled captivity in the organisation more than it did supporting adherence. It was concluded by stating that to more accurately predict how employees will react to dissatisfaction, a greater understanding of voice and loyalty was required.

2.4. Conceptual Research Framework

2.4.1 Argument for Study

The onset of globalisation in the modern world i.e., a “borderless” world with for freedom of movement of citizens has contributed to invisible emigration of refinery engineers where emigration occurred unrecorded because, the formal migration process to record their departure was not followed (Ullah and Haque, 2020). As mentioned in Chapter 1, and the absence of official migration statistics by Statistics South Africa, prior to 2016, means South Africa has little data pertaining the global movement of its citizens. Consequently, refining companies are unable to quantify the current emigration rate and potential brain drain due to future planned emigration of their engineers. The motivation for the study was to develop a method to measure the emigration potential of engineers and to understand the reasons for the loss of experienced refinery engineers over the last 10 years. As this reason(s) for the outflux of engineers was not well understood and has to date been attributed solely higher earnings abroad. The intended audience of this study are refining company executives, human resources managers and refinery engineers.

2.4.2 Generation of study

The first aspect of the problem statement is that the refining sector is losing experienced engineers at what is believed to be a high rate. This outflux of skills, and subsequent brain drain, negatively impacts the productivity and efficiency of refineries. The first and second research questions deal with measurement of the emigration potential to quantify the brain drain threat and the demographic characteristics of the positive emigration potential engineers respectively. Due to the fact the reasons for the outflux of engineers are not known but assumed to be due to higher salaries abroad, the third research questions addressed this gap by determining the critical factors that are driving the emigration of refinery engineers. The fourth research questions attempt to resolve the problem statement by proposing strategies companies can use to reduce the emigration potential of their current engineers, while the fifth research question provides a strategies refining companies can use to achieve a lower emigration potential of future staff.

2.4.3 Theoretical Framework

As graphically shown in Figure 1.1 of Chapter 1, the core of theoretical research framework used in this study utilised a combination 5 theories pertaining to migration, work environment and motivation. The in-depth literature review of previous research from journal, articles and published theories relating to emigration resulted in the development of 3 main theory clusters shown in Table 2.3 Below. The theories

Table 2.3: The Study's Theoretical Framework Theory Clusters

No.	Research Cluster	Relevant Theory	Theories to be examined	Clusters Major Proposition(s)
1	Migration Theory	(1) Neoclassical Economic Theory (2) Push and Pull Factor Theory	1, 2	1.A rapidly deteriorating Macro-economic climate is fueling emigration.
2	Work Environment and Motivation	(3) Adam's Equity Theory (4) Hertzberg's Two Factor Theory (5) Maslow's Hierarchy Theory (6) Vrooms Expectancy Theory (7) Kelly and Rotter's lotus of control theory (8) Job Redesign. (9) Lawler's effort-performance expectancy and performance-outcome theory	3, 4, 6, 8, 9	1.An unhappy work environment and employee dissatisfaction is fueling emigration.
3	Work Life	10. Quality of Work Life	10.	Changing needs of a new generation of workers is fueling emigration.

Source: Author

2.4.4 Key Factors and Presumed Relationships

The key factors that shown forth from the literature review were the following:

The absence of accurate emigration data to quantify extent of emigration. With free movement of human capital, the threat of invisible emigration and resultant brain drain is threat to safe and stable operation of South African refineries. This factor is critical for the study because its first research question and research aim are about determining the emigration potential of the current engineers to develop a method to measure the emigration potential of current staff i.e., the likely likelihood that they will emigrate.

The changing workforce from Baby Boomers to Millennials has come with a change in expectations about the workplace with inclusion and transparency holding more importance with the Millennials. Being at the forefront of the digital age and having a different way of working compared to earlier generations, the expectation is that a paradigm shift in work culture bay be required to accommodate this growing percentage of the workforce. The COVID-19 pandemic and accelerated some aspects where the millennial workforce desires more work-life balance and looking for jobs that offer this, for example, a hybrid working arrangement where employees can work remotely some days.

The work motivation theories revealed the key factors to be centred around equity and fairness in the workplace (Adam's Equity Theory) in terms of procedural justice and distributive justice. Literature also revealed that company performance management systems, which are largely rooted Vroom's expectancy theory on pay performance, which are intended to motivate employees very often results in employee dissatisfaction. The expectation is to a clear relationship between incentive program effectiveness and employee motivation/demotivation which has strong links to effective line management. Aspects such as job satisfaction, career progression, job redesign, recognition, achievement, and growth opportunities as well as hygiene factors such as work relationships with managers and colleagues, the work environment, salary and compony procedures and policies (Hertzberg's two factor theory).

The neoclassical theory and the economic factors and social of the push and pull factor theory shone as key factors in the literature review. For the macroeconomic, it was particularly the rapid deterioration of South Africa macro-economic climate result in high cost of living. In the same vein, the weakening Rand (ZAR) currency making foreign currency earning more attractive which had links to the neoclassical economic theory where migration was primarily due to better wages in the host country. The second aspect of the push and pull factors was the social factors due to South Africa's high level of violent crime.

2.4.6 Contribution to the body of knowledge

With the current emigration rate of engineering being unknown, this study is expected measure ang highlight the current emigration potential of South African refinery engineers. The study will develop therefore develop a method to measure the emigration potential. Furthermore, this study is also expected to develop a clear interventions framework, emanating from the study findings, to reduce the emigration potential.

2.5 Chapter Summary

Emigration can be defined as the act of leaving the borders of one's country, for a short time or permanent basis, to take residence in a new country where you were not born (Ince, 2020; Han, 2017). International migration is not a new phenomenon, in fact, existing migration data dating back to the 19th century when European migrated to the to the New World (Elsner, 2015). The world has however moved to an age of rapid globalisation and freedom of movement, which has increased international migration, global security, and adversely affected climate change across the whole world (Żółnowska, 2020; Castles and Miller, 2009 as cited in Weeks, 2012).

South Africa has suffered from invisible migration, which occurs when citizens leave without following formal migration processes to record their departure, making obtaining quality statistics and migration research challenging (Ullah and Haque, 2020). Prior to the Stats SA 2016 community survey which sampled 1.3 million households, migration studies had not been conducted by Statistics South Africa meaning no comprehensive emigration statistics were available (Statistics South Africa Community Survey, 2016; Wakefield 2015).

In many societies globally, the young adults are the age group with the highest propensity to migrate due to them being their productive and reproductive prime in addition to the age and life-cycle changes that affect most humans in various societies (Cao and Han 2019; Acheampong - as cited in Assan and Kharisma, 2019; Weeks, 2012). The youth migration in the work of Cao and Han (2019), Okičić (2019) and Weeks (2012) which showed a similar migration peak between the ages of 24 to 39. Besides the traditional economic push factors that result in highly skilled employees leaving their home countries i.e., economic problems such as unemployment and a high cost of living, taxation, a lack of infrastructural development, recent studies have shown that other factors linked to quality of education, and social and cultural problems like poverty, crime and war as well as natural phenomenon like climate change, natural and environmental disasters can also play a major role in the decision to emigrate (Driessen, 2016; Topkaya, 2015; Mattes and Richmond - as cited in Campbell, 2002).

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Different authors define research through various lenses; however, it can broadly be defined as the detailed study of a subject and/or using existing knowledge in a new way to generate new concepts and gain a new understanding in a critical, objective, and reliable way. This view is supported Mligo (2016) who highlights that when breaking the word "research" down etymologically into two syllabi, the prefix "re" which means doing something again and "search" which means careful inquiry or examination we see the true meaning of the word. Basias and Pollalis (2018) define research as creative, systematic effort to establish new knowledge, confirm existing knowledge and facts, solve current problems innovatively and develop new theories. Dadhe (2016) defines research as a process that uses thorough, objective, critical, data-based analysis of the situational factors related to problem to find answers and solutions to it.

The previous chapter, chapter 2, gave an overview of the work done in the fields of emigration, work environment and motivation and how it impacts employee's decision to emigrate. Various migration theories were examined, for example, the push and pull factors theory which put focus on the economic, social, and political reason that cause fuel migration, as well as the neoclassical migration theory. The theories pertaining to work motivation showed the important role the workplace plays in overall employee satisfaction. Using existing literature, a conceptual research framework was developed. This next chapter, 3, will further build on this conceptual framework and outline the research process and procedures i.e., research approach, methodology and design to be followed to achieve the overall aim of the research described in chapter 1 and 2.

3.1.1 Research Methodology

Research methodology can be defined as a bridge between a problem and its solution. It is the systematic, scientific, and logical process researchers follow that leads to the solution (Dadhe, 2016). Selecting the right research methodology essential to perform effective and impactful research. The choice of research methodology to be used in the study will be largely influenced by the research objectives and the type of available methodologies that been successfully used in previous research (Basias and Pollalis, 2018).

3.1.2 Aim and Objectives of the Study

The aim of a research study is to have an understand the emigration potential of current engineers working in the South African petrochemical industry, understand the brain drain threat and developing strategies to reduce emigration potential of these engineers. The main objective of this study was to determine the following:

Objective 1: Determine the emigration potential of current engineering professionals in the South African petrochemical industry.
Objective 2: To explore the demographic characteristics of the engineers who want to emigrate.
Objective 3: Identify the main factors contributing to current employees wanting to emigrate.
Objective 4: Propose strategies to reduce emigration of engineering professionals in the South African petroleum refining industry.
Objective 5: To propose hiring strategies that can be used to ensure a higher retention rate of future staff.

3.1.3 Research Questions

The key research questions that needed to be answered by this study are below:

Question 1: What is the current emigration potential amongst engineering professionals in the South African Petroleum sector?
Question 2: What are the demographic characteristics of the personnel who intend to emigrate?
Question 3: What are the critical factors that determine whether the employees will stay or leave?
Question 4: What strategies can be employed to reduce the emigration potential of current staff?

Question 5: What hiring strategies can be used to ensure a higher retention rate/lower emigration potential of future staff?

3.2 Research Philosophy, Theory Development and Paradigm

3.2.1 Research Philosophy

The critical realist philosophy will be used to understand the extent of the potential skills loss by measuring the emigration potential of current staff. The Critical Realism research philosophy investigates the status quo and aims to understand the underlying reasons and relationships of the status quo (Saunders and Tosey, 2013).

3.2.2 Approach to Theory Development

This research study will use the inductive reasoning approach to theory development, where the theory and solutions will be derived from the data analysis results. The inductive reasoning approach identifies the research problem, gathers data, analyzes it, and builds a theory that is based on the findings from the data analysis (Bourke, Kirby, and Doran, 2016).

3.2.3 Research Paradigms/Worldviews

Creswell (2014) advises researchers to think about the philosophical worldview assumption that they will base their study on, which he defines as the set of beliefs that guide action (Guba – as cited in Creswell, 2014; Creswell and Plano Clark, 2007). Creswell (2014) further explains the four worldviews, or paradigms, widely used in research are positivism, pragmatism, constructivism and transformative. The researcher may choose to use more than one worldview in their research, which are briefly described below.

(i) Pragmatism: This paradigm is a problem-oriented and solution focused philosophy because, it aims to use the most relevant research methods, which are often a combination of quantitative and qualitative methods, to effectively answer the research question(s) and provide credible solutions.

(ii) Constructivism: This paradigm promotes learning as a process where latest information is added to a foundation of prior knowledge.

(iii) Positivism: This paradigm utilises a fact-based investigation aimed at findings the objective truth, and does not allow for non-factual, emotional and/or subjective interpretation to support a theoretical position. (Blaikie – as cited in Robson and McCartan, 2016; Ulinnuha, 2020; Hickey, 2016)

(iv) Transformative: This paradigm believes that research must relate to political change and innovation to result in radical transformation of society, whilst focusing on meeting the needs of the disadvantaged, oppressed and or marginalized groups in society through technological advancement (Creswell, 2014; Elrahman and Giannopoulis, 2011).

A combination of the pragmatism, constructivism and positivism paradigms were adopted in this research study. This is because study used a mixed method approach to answer the research questions using existing knowledge and building it. The study was objective and fact-based. The combination of the pragmatist, constructivist, and positivist research philosophy will ensure the reliability of the research study and an accurate generalization of the findings are made.

3.3 Research Design and Methodical Choice/Approach

3.3.1 Research Design

While methodology can be defined as the bridge between a problem and the solution, research design determines what that bridge will look like, and the materials from which it will be built. As put by Dadhe (2016), research design is a detailed plan of action that must be executed during the research study to achieve the research objectives. While the plan may be subject to adjustments as the research progress, it will contain the following elements:

- A clear research problem.
- Type of reasoning to be used to find solutions.
- The research type, for example, descriptive or scientific research.

- Sampling design.
- Data collection tools and procedures.
- Resources required for the study.

A good research design is vital because, it forms the foundation of the entire research as it has a considerable influence on the reliability of the research conducted (Kothari, 2004). According to Apuke (2017), the following common problems and shortcomings in research:

- The research problem, purpose, and aim of the study is unclear.
- The data that is questionable
- Deception by omitting or withholding pertinent information about the data collection procedure to be used.
- The research findings or results and that vague and mirky.

3.3.2 Research Methodical Approach/Choice

There are three main methodical approaches or choices available for researchers to choose from; (i) qualitative (ii) quantitative and (iii) mixed method approach which is a combination of the qualitative and quantitative approaches. The qualitative research approach uses research methodology that involve a subjective assessment of aspects such as opinions, experiences, behaviours, relations, and attitudes, without the use of mathematical models and statistics when processing numerical data. The quantitative approach on the other hand puts empirical data through rigorous analysis using mathematical models, simulation and/or statistics. The main differences between qualitative and quantitative research are summarized in Table 3.1.

Table 3.1: Differences between qualitative and quantitative research

Criteria	Qualitative Research	Quantitative Research

Focus and Aim	The aim of this approach is to have a complete, detailed description of what is observed. The focus is therefore through a wide-angle lens; examines the breadth depth of phenomena.	The aim of this approach is to count things and test hypothesis to explain what is observed. The focus is therefore through an arrow-angle lens; tests a specific hypothesis.
Purpose	To contextualize, interpret social interactions, understand perspectives.	To do generalizations, predictions, and causal explanations.
Research Objectives	Explore, discover, & construct.	Describe, explain, & predict.
Tools	The researchers are the data gathering instrument.	The researcher uses tools such as surveys to collect numerical data.
Variables	Study of the whole, not variables.	Study of specific variables.
Type of Data Collected	Data collection is unstructured	Data collection is structured
Forms of Data Collected	Qualitative data such as open-ended responses, interviews, participant observations, field notes, & reflections.	Quantitative data based on precise measurements using structured & validated data-collection instruments.
Output	Data is in the form of words, pictures/images, or objects.	Data is in form of numbers and statistics
Sample	The sample is usually a small number of non-representative cases. Respondents are selected based on their experience.	Usually, many cases representing the population of interest.

Objective/Subjective	The approach is subjective with the individual's interpretation of events or facts.	The approach is objective which seeks to precise measurement and analysis.
Researcher role	The researcher tends to become immersed in the subject matter. Researcher & their biases may be known to participants in the study, & participant characteristics may be known to the researcher.	The researcher tends to remain objectively separated from the subject matter. Researcher & their biases are not known to participants in the study, & participant characteristics are deliberately hidden from the researcher (double blind studies).
Analysis	Data analysis is interpretive and identifies patterns and themes.	Data analysis identifies statistical relationships.
Results	Results Particular or specialized findings that is less generalizable.	Generalizable findings that can be applied to other populations.
Final Report	Narrative report with contextual description & direct quotations from research participants.	Statistical report with correlations, comparisons of means, & statistical significance of findings.

Source: Adapted from Johnson, & Christensen (as cited in Apuke, 2017); Allibang (2016)

3.4 Research Strategy

The research strategy adopted for this study is Action Research because, the primary aim of this research is to provide a specific solution(s) to a specific problem currently face in industry i.e., emigration and subsequent skills loss of engineers working in the South Africa’s refining industry. The reasons for the exodus of engineers is not well understood, and therefore largely been attributed to higher salaries abroad (Riel, 2020).To understand the emigration potential of current staff this study adopted the four elements of Action Research as described by Elg, Gremyr, Halldorsson and Wallo (2020) where are: (1) Identification of the problem (2) theorization (3) creating guiding concepts and (4) developing the intervention(s).

Types of Research - Exploratory, Descriptive and Causal Research

Exploratory or Formulative research is done when a phenomenon is not clearly understood or defined and/or to obtain new insights into an existing phenomenon. This this type of research is incipient by nature and therefore lays the foundation for further research in the area(s) being explored. In a commercial context it can be used for market research to test new concepts. This research type can either be formal through doing structured interviews, focussed group discussion or case studies and can also be informal using secondary data, for example, literature reviews and casual conversations with consumers to get their view and perspectives (Kothari – as cited in Nzeru, 2020; Mligo, 2016; Sekaran and Bougie, 2013).

Descriptive research is done when characteristics of a problem, whether it be a situation or group of people, are described descriptively using percentages and averages in place of statistical techniques, for example, election or opinion polls. This differs from causal research, also termed analytical research that relies heavily on statistical analysis. This heart of the statistical approach is to determine the extent of cause-and-effect relationships through hypothesis testing (Rao, 2014).

This study will use a combination of exploratory and descriptive research to descriptively describe the various aspects, for example, the age range, highest qualification, experience level of engineers with a positive emigration potential, and find the underlying reasons for their positive emigration potential. This will be done through structures, in-depth interviews, and surveys of engineers in South Africa’s petrochemical industry.

3.5 Time Horizon

Time horizons defines the time frame and data collection of a study i.e., whether data is collected just once at a specific point in time or whether it's collected multiple times over a period. Melnikovas (2003) explains that longitudinal studies therefore allow researchers to study a phenomenon over two or more data collection points. For example, to understand the impact of a change in company benefits, a researcher may collect employee data before the benefits change and then again sometime after change has taken effect. Cross sectional studies are studies, often called one-shot studies, are studies where data is collected one time. On the other hand, data collection for Longitudinal studies happens more than once over a period. This study employed the cross-sectional study time horizon.

3.6 Population and Sample Techniques

3.6.1 Population

The population for this research study comprised of participants who hold a formal engineering diploma or degree from a recognized University or University of Technology, working in technical roles such as engineers, technologists, and technicians, in the South African petroleum refining industry. Due to the reluctance of South African petroleum refining companies to divulge information pertaining to their employment figures for engineering professionals, the exact population is unknown but is estimated to be 1100 for the South African petroleum refining industry.

3.6.2 Sample Frame

The sample frame is a list of all the items that make up the population from which the sample will be extracted by the researcher. Though similar, and sometimes identical, the key difference between the sample and the populations is that the sample is while the population is general. The sample frame for this study was South Africa's 6 refining companies in Table 3.2 below:

Table 3.2: SA's 6 Major Petrochemical Refining Companies

No.	Refinery	Location	Feed	Capacity (barrels per day)	Staff Complement (direct employees)
1.	**Shell & BP South African Refineries – Sapref Refinery**	Durban	Crude Oil	180,000	780
2.	**Petroliam Nasional Bhd - Engen Refinery**	Durban	Crude Oil	120,000	650
3.	**Glencore - Plc Astron Energy**	Cape Town	Crude Oil	100,000	500
4.	**Sasol Ltd – Natref Refinery**	Sasolburg	Crude Oil	108,000	650
5.	**PetroSA Gas to Liquids (GTL)**	Mossel Bay	Methane Gas	45, 000	1200
6.	**Sasol Ltd - Sasol Secunda Coal to Liquids (CTL)**	Secunda	Coal	150, 000	~10000

Source: Adapted from SAPIA (2021); Makhaye (2021); Astron Energy (2021)

3.6.3 Sampling Technique

3.6.3.1 Sampling Technique for Interviews

Purposive judgment sampling, where the researcher chose subjects based on a specified criterion, was used for in-depth structured interviews (Cooper and Schindler, 2014; Kothari, 2004). The participants i.e., engineering professionals from various petroleum refineries, were selected for the interviews were a diverse sample that was rich in information to fully understand the underlying phenomenon (Patton, 1990 – as cited in Onwuegbuzie and Collins, 2007). The participants were engineering professionals with a minimum of 5 years' experience from various South African petroleum refineries for the interviews and a minimum of 1 year for the quantitative surveys. For the qualitative interviews, the purposive sampling technique was used because, it allowed the author to identify and select the most information rich participants who would offer valuable insights in into the topic under study. The chosen participants had sufficient work experience to clearly articulate their experiences, and the reasons for their views. Most of the interviews last between 45 to 90 minutes.

3.6.3.2 Sampling Technique for Survey Questionnaire

A combination of purposive, random and snowball was used for data collection using the questionnaire. The electronic questionnaire was distributed to the engineering professionals in South Africa, via an email link, sent to the various HR departments of companies in the petroleum refining Industry. Professional Networks like LinkedIn was also used (Cooper and Schindler, 2014; Kothari, 2004). Participants were also requested to forward the questionnaire to their colleagues and friends who are engineering professionals in the petroleum industry. A combination of the three above mentioned techniques was selected to ensure the maximum possible reach to refining engineers. Initially, purposive sampling was used questionnaire was sent directly to information rich engineers who were in the refining industry who expressed interest in participating in the study. Snowball sampling was then employed by requesting these engineers were then requested to forward the electronic survey link to their colleagues and contacts and to encourage their participation. Finally, the survey link was sent randomly as a direct message to refining engineers identified on LinkedIn.

3.6.4 Sample Size and Saturation

There has long been a strong debate and discussions around the optimum sample size requirements for qualitative research. The debate has been difficult to conclude because qualitative research has several different research approaches, for example, action research, case studies, content analysis and phenomenology which all have different sample size requirements to attain saturation. While sample sizes for qualitative research may vary by technique, they are known to be small. (Vasileiou, Barnett, Thorpe, Young, 2018; Mason, 2010; Cooper and Schindler, 2014, p.151).

3.6.4.1 Saturation

Saturation, which finds its root in the grounded theory approach has been adopted by other qualitative research approaches. A sample is considered by researchers to have achieved saturation when new or fresh data does not provide fresh insights, new concepts, relevant categories, and themes etc. (Saunders, Sim, Kingstone, Baker, Waterfield, Bartlam, Burroughs, and Jinks, 2018; Dworkin 2012; Thomson, 2011; Mason 2010). In their work, Saunders et al., (2018) go on to further describe the four different models of situation listed in Table 3.3. In this research study, strategies to reduce the emigration of engineering professionals in the South African petroleum refining industry, the two strongest saturation models used in this study were data saturation during the data collection phase and Inductive thematic saturation achieved during inductive thematic analysis. In this study, I, the research observed saturation was observed by the 19th interview when the emergence of new themes stopped.

Table 3.3: Four models of saturation in research

Model	**Description**	**Principal Focus**
Theoretical saturation	Relates to the development of theoretical categories; related to grounded theory methodology	Sampling
Inductive thematic saturation	Relates to the emergence of new codes or themes	Analysis

priori thematic saturation	Relates to the degree to which identified codes or themes are exemplified in the data	Sampling
Data saturation	Relates to the degree to which new data repeat what was expressed in previous data	Data collection

Source: Saunders et al., (2018)

3.6.4.2 Sample Size

Qualitative researchers have avoided giving definite numbers of what constitutes an adequate sample size to achieve saturation in qualitative studies, which is something researchers have been able to do in quantitative studies. In their work, Dworkin (2012), Mason (2010) and Collins and Onwuegbuzie (2007) reviewed literature for optimum sample sizes required for thorough qualitative research and found the sample size and sources shown in Table 3.4. Mason further states that the above authors did not provide in compelling detail why some approaches require bigger samples and some less or provide empirical evidence to substantiate the sample size ranges provided. Research work conducted by Lee, Woo, and Mackenzie (2002) put forward a view that studies that use multimethod research approaches like the mixed method, can require smaller sample size for adequacy when compared to a single method research approach. The same reduced sample size logic applies for longitudinal studies where the same participant undergoes multiple in-depth interviews that span over a period (Mason, 2010).

This mixed method research study has a sample size of 87 quantitative survey responses, which was reduced from 120 survey responses after data editing, and a sample size of 25 participants for the qualitative in-depth interviews. The sample size of 25 interview participants is large enough to achieve saturation because, according to Thomson (2011), his review of 100 research articles using interviews as the common data collection had average sample size of 25 participants, stating that saturation is normally achieve between the 10th and 30th interview. Mason (2010) had similar findings after a conducting of content analysis and screening of 532, 646 PhD abstract accepted for higher degrees by universities in Great Britain and Ireland between the years 1716 and 2009. After applying an inclusion criterion through screening, Mason, analysed 560 PhD abstracts covering all qualitative research approaches. Table 3.4 shows an extract of the results obtained for Action research and grounded theory.

Table 3.4: Sample size findings for PhD degrees awarded between 1716 and 2009 in Great Britain and Ireland based universities

	Number of studies found	**Number of studies after inclusion criteria applied.**	**Range**		**Measure of central dispersion**			
			High	**Low**	**Mode**	**Mean**	**Median**	**STD Deviation**
Action Research	140	28	67	3	6	23	17	18.4
Grounded theory	429	174	87	4	25	32	30	16.6

Source: Adapted from Mason (2010)

The researchers view that this research study to, strategies to reduce the emigration of engineering professionals in the South African petroleum refining industry, has achieved saturation is further validated by the samples size requirements to achieve saturation in Table 3.5. Table 3.5 shows which shows that qualitative research can reach saturation with sample size as small as 12 participants when using interviews as the data collection tool, which consistent with the view of Thomson (2011) that saturation is normally be reached form the 10th sample.

The quantitative survey was used a tool to validate and the findings from the interviews and strengthen the accuracy and extrapolation and generalization of findings to the population. It is important to note that the purpose of the 120 surveys received, and the 87 used for data analysis after data editing, quantitative surveys was not to make statistical generalization but to strengthen to analytical generalization made in this research study.

Table 3.5: Optimum qualitative studies samples sizes according to various researchers

Research Approach	Sample Size	Reference
Ethnography	30-50 interviews	Morse (1994, p.225)
	1 Cultural group	Creswell 2002
ethnoscience	30-60 interviews	Bernard (2000, p.178)
	30-50 interviews	Morse (1994, p.225)
Grounded theory methodology	20-30	Creswell (1998, p.64)
	15-20	Creswell 2002
	30-50 interviews	Morse (1994, p.225)
Phenomenology	5-25	Creswell (1998, p.64)
	Minimum 6	Morse (1994, p.225)
All qualitative research	Minimum 15	Bertaux (1981, p.35) adapted from guest et al., 2006
	5-50	Dworkin 2012

	Minimum 12	Guest, Bunce, and Johnson (2006)
Focus group	6-9 participants	Krueger 2006
	6-12	Johnson & Christenen 2004; Bernard 1995
Case Study	3-5 participants	Creswell 2002

Source: Adapted from Dworkin (2012); Mason (2010); Collins and Onwuegbuzie (2007)

3.7 Data Collection Instruments

While qualitative research survey uses survey questionnaires to collect data and statistics to test hypothesis and generalize, quantitative research uses a variety of research instruments, for example, individual face to face or telephonic interviews, focused groups discussions, observation of interactions and case studies use an interpretive paradigm which is inherently subjective in nature (Bashir, Afzal and Azeem, 2008). Various data collection methods can be used in with some of the most frequently used data collection methods shown in Table 3.6.

Table 3.6: Data collection methods used in research

Method	**Overall Purpose**	**Advantages**	**Challenges**
questionnaires, surveys, checklists	when need to quickly and/or easily get lots of information from people in a non-threatening way	-can complete anonymously -inexpensive to administer -easy to compare and analyse -administer to many people -can get lots of data -many sample questionnaires already exist	-might not get careful feedback -wording can bias client's responses -are impersonal -in surveys, may need sampling expert - doesn't get full story

interviews	when want to fully understand someone's impressions or experiences, or learn more about their answers to questionnaires	-get full range and depth of information -develops relationship with client -can be flexible with client	-can take much time -can be hard to analyse and compare -can be costly -interviewer can bias client's responses
documentation review	when want impression of how program operates without interrupting the program; is from review of applications, finances, memos, minutes, etc.	-get comprehensive and historical information -doesn't interrupt program or client's routine in program -information already exists -few biases about information	-often takes much time -info may be incomplete -need to be quite clear about what looking for -not flexible means to get data; data restricted to what already exists
observation	to gather accurate information about how a program operates, particularly about processes	-view operations of a program as they are occurring -can adapt to events as they occur	-can be difficult to interpret seen behaviours -can be complex to categorize observations -can influence behaviours of program participants -can be expensive
focus groups	explore a topic in depth through group discussion, e.g., about reactions to an experience or suggestion, understanding common complaints, etc.; useful in evaluation and marketing	-quickly and reliably get common impressions -can be efficient way to get range and depth of information in short time - can convey key information about programs	-can be hard to analyse responses -need good facilitator for safety and closure -difficult to schedule 6-8 people together
case studies	to fully understand or depict client's experiences in a program, and conduct comprehensive examination through cross comparison of cases	-fully depicts client's experience in program input, process, and results -powerful means to portray program to outsiders	-usually quite time consuming to collect, organize and describe -represents depth of information, rather than breadth

Source: McNamara (n.d)

3.7.1 Primary Data

Primary data is data that has been obtained directly from the main source through interviews, observation, experiments, and survey questionnaires etc. The primary source in this study was engineers who have work experience in the South African petrochemical refining industry. Quantitative data was collected through questionnaires/surveys based on well-structured multiple Likert scale questionnaires and qualitative data was collected through structured interviews (Allibang, 2016; Saunders, 2009).

Interviews:

The purpose of the qualitative interviews was to engage with the participants on various aspect of their careers to determine and get insights on their view, feelings and perceptions about their current employment and future (Kothari, 2004). Interviews were chosen as the primary data collection technique for the qualitative part of the study because they have shown to be the most effective data collection technique because their open-ended nature helps explain phenomena to better understand the underlying behaviours, preferences, views or opinions, attitudes, and experiences. Interviews also offer flexibility depending on the intend of the study in that they can be conducted on an individual one-on-one basis between interviewee and interviewer, or in a group. They can be conducted face-to-face, online using video calling or by telephone. They can be structured interviews, semi-structured or unstructured and they can be with participants who are knowns to the interviewers/moderators or with participants where not known to them; it all is depending on the intent or goal of the research study (Virginia Tech, 2018).

The interviews were conducted using a structured interview guide containing 49 questions which typically lasted between 45 minutes and 90 minutes each. The questions were is divided into the following five sections:

- Section 1: Demographic Details
- Section 2: Emigration Potential and Barriers
- Section 3: Push-Pull Factors (Political, Economic and Social)

- Section 4: Work Environment
- Section 5: Retention of Skilled Employees.

The interviews were conducted over the telephone and were recorded using an Olympus VN-542PC Dictaphone and thereafter transcribed. Speaking over the phone, instead of face-to-face, had its advantages. For example, it was easier for the participants to speak freely and openly about their thoughts and feelings. The main disadvantage of the telephonic interviews was the inability to read the body language signs are ques.

Survey Questionnaire

Survey questionnaires are generally defined as a research instrument which has a set of questions with the aim of gathering information or data from respondents to draw relationships between different variables and better to understand the cause and effect. The desired information can relate to views, intentions, attitudes, preferences of the respondents. Survey questionnaires are a popular data collection instrument that is extensively used by academic researchers, market researchers and organisations in the public, private sectors at large due to their ease of use, low cost, and wise reach. The ease of use lies in the fact that the physical engagement that questionnaire requires is far less than that of interviews because, the researcher typically mails the questionnaire to the participants with a request to complete on their own and send it back once completed. A disadvantaged of questionnaires is that the response rate be low due to a poorly designed questionnaire and/or ambiguous questions (Nzeru 2020; Bourke, Kirby, and Doran, 2016; Kothari 2004).
The survey questionnaire used in this research study comprised of the following six sections:

1. Biographic details.
2. Emigration Potential for Working Abroad.
3. Push Factors.
4. Circumstance Comparison.
5. Work Environment Factors.

6. Retention Factors.

3.7.2 Secondary Data

Secondary data is data that has been generated by researchers or another source in the past, which has been made available to use. This data was once primary data which became secondary data once it was used by a third party. This type of data has several advantages over primary data, some which are:

- Secondary of data is readily available in journals, books, online articles and can be easily accessed as compared to primary data which take time and effort to collect.
- Secondary is affordable and in most cases it is free.

While secondary data is useful it does have potential shortfalls, for instance, it could be unreliable, outdated and could be bias. This research study employed various types of secondary data which included data from previous research in migration, government reports, web articles and websites and official statistics (Swart, 2009).

3.7.3 Triangulation

Triangulation in research is a concept where a variety of methodologies, perspectives, data sets are used to increase and strengthen the credibility and validity of the research findings (Carter, Bryant-Lukosius, DiCenso, Blythe and Neville, 2014). It benefits the study and strengthens research credibility in the following ways:

(i) Triangulation provides an opportunity to gain a better, more comprehensive understanding of a phenomena or topic under study by analysing data collected through different methods, for example, questionnaires and interviews.

(ii) It helps to reduce researcher bias because different views, perspectives and findings from other research studies are taken into consideration during the investigation.

Noble and Heale (2019) agree with the above view from Carter et al., (2014) when they explain that triangulation can use multiple research sources, data collection mediums, theories and/or data analysis methods to cross verify research findings with the sole aim of increase research credibility and validity. The main types of triangulations are below:

(i) Methodological triangulation which uses two of more data collection methods, for example, interviews, questionnaires observation etc.
(ii) Triangulation of theories which uses multiple theoretical schemes and/or hypothesis for examination and interpretation of a phenomenon or situation.
(iii) Investigator triangulation which uses several researchers in a study to capture different professional views on a phenomenon.
(iv) Triangulation of data triangulation which has been obtained from various sources, at differences places and at different times (Denzin - as cited in Fick, 2018)

The study used mixed method approach where the data qualitative and quantitative data were analysed separately, interpreted, and brought together to reach balanced conclusions i.e., the convergence model of triangulation. Methodological triangulation was used in this study and achieved by using of different data collection methods i.e., a quantitative survey questionnaire and structured interviews, and by using two different data analysis techniques i.e., descriptive analysis for the questionnaires and thematic analysis for the interviews. Figure 1.2 showed the adapted mixed method approached used in this study.

The data collected from the qualitative interviews qualitative interviews underwent manual thematic analysis to analyze various themes and accurately interpret the data. Processing of the quantitative survey questionnaire data involved the editing, coding, categorizing, and tabulating the data, analyzing it, and reporting and accurately interpreting patterns. (Saldana, 2009; Kothari, 2004). These steps are further described in detail below:

i. Data Editing: This is the first step of data processing, and it involves the thorough review of the collected data collected from the survey questionnaires to ensure erroneous data, due to entry mistakes, are removed and to ensure that the data is accurate, logical, and consistent. Editing is essentially an improvement and preparation of survey data for the coding and tabulation steps, which follows thereafter. The data collected from the quantitative survey questionnaire underwent quality check to determine response errors and unanswered questions, which resulted in the 121 received questionnaires being reduced to 87 complete questionnaires analysed in the study.

ii. Data Coding: The step of coding is usually used when processing survey data and involves translating responses and/and feedback into numerical values for statistical analysis. When coding data, it is important to ensure that the codes are unambitious and exhaustive. In this research study, all the questions that were coded were closed questions on a five-point Liker scale. A unique number was assigned to each possible response, and only to that response. For example, the points in the Likert scale of “Strongly disagree” (1), “Slightly Disagree” (2), “Undecided” (3), “Slightly Agree” (4), “Strongly agree” (5) (Irshad, Yousaf, Usman, 2021; Bourke, Kirby, and Doran, 2016). The two main errors in coding which can ultimately result in misrepresentation of data and inaccurate conclusion are: (1) Recording answers incorrectly, also known as transcription errors. (2) Incorrect application of coding rules, also known as coding decision errors. Some techniques used to minimize coding errors are:
    - Double checking the valid range. For this research study coding scale of 1 to 5 we used, so having a code of number beyond the range like 7 would indicate an error.
    - Logic check, for example, when respondent age is 25 but their level of postgraduate work experience is 20 years (Bourke, Kirby, and Doran, 2016).

iii. Data Classification: Research studies by design can generate large amounts of data. To better handle and interpret this data and determine meaningful relationships, it is arranged into groups which have common characteristics like gender, race age etc. In addition to classification, the qualitative data collected from the interviews underwent grouping into specific themes that emerged to enable thematic analysis. As described by Xu and Zammit (2020) and Braun and Clarke (2019, 2006) The below core steps are generally followed during execution of the thematic analysis.

1) Data familiarization which involved reading through all the interviews several times.
2) Identification of emerging themes to create the core or main themes.
3) Reviewing and refinement of the theme groups.
4) Defining and name the theme groups.
5) Tabulation of the themes.
6) Reporting of the finding

iv. Tabulation: This step of the data processing assists with the arrangement and placement of data in a simplified, systematic, and coherent manner for statistical and thematic analysis. The tables will consist of a few rows and columns, which were done electronically during this research study.

3.8 Mixed Method Data Analysis

The mixed method approach has been used more and more lately due to the ability to use the strengths from both the qualitative and quantitative methods to provide a clear picture of the research problem i.e., trends, scenarios etc. and detailed analysis which the qualitative and quantitative methods are unable to adequately do by themselves. (Basias and Pollalis, 2018; Dadhe, 2016; Saunders et al., 2009; Johnson, Onwuegbuzie, and Turner, 2007; Creswell 2003). This is because with quantitative analysis allowed the researcher to use statistical analysis to draw inferences while the qualitative analysis allowed the researcher to gain an in-depth understanding of the underlying phenomena (Onwuegbuzie and Collins, 2007). Figure 3.1 show a summary of some of the strengths and weaknesses of the quantitative and qualitative research approached.

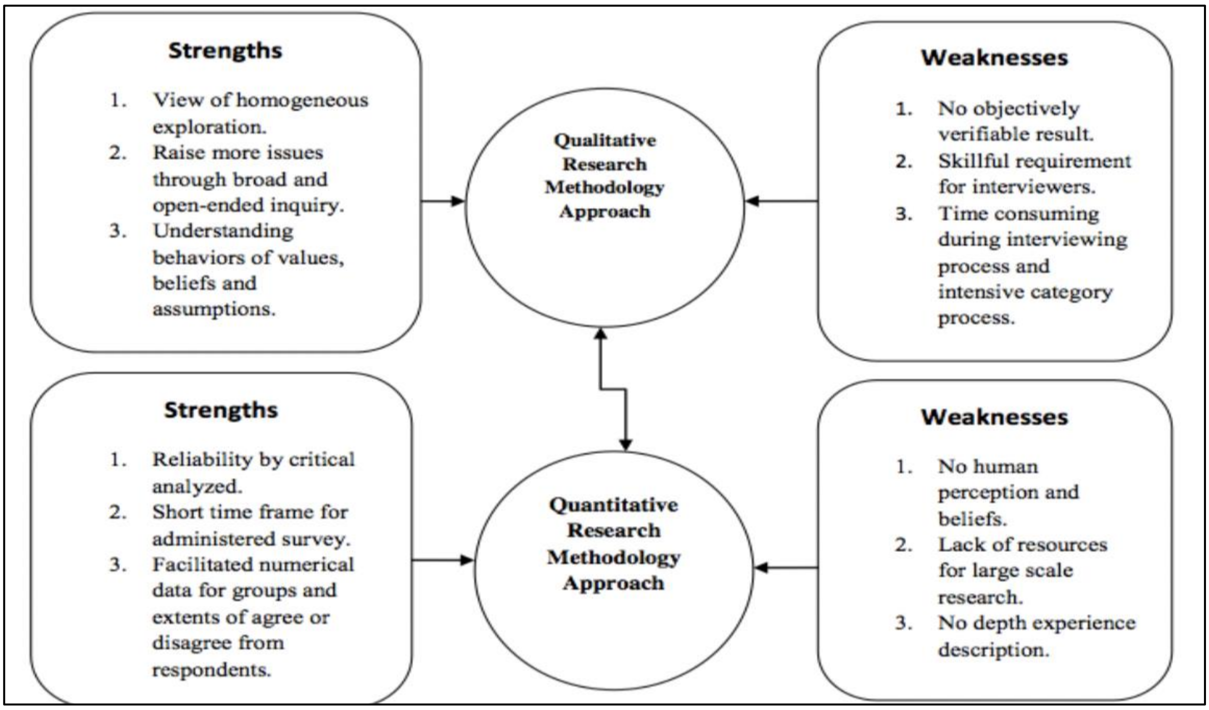


Figure 3.1: Summary of the strengths and weaknesses of qualitative research (Choy, 2014 – as cited in Pasco, n.d)

The qualitative aspect of this research used in-depth structured and standardized interviews, done in a one to one and personal setting which provided a lot of detailed information on the views, experiences and opinions of the interviewees. The standardized format of the interview questions allowed for smoother data analysis and easier generalization of the responses. For the quantitative and descriptive aspects of the research study, survey techniques with a questionnaire were employed. This allowed the researcher to collect various types of information from a wider audience, for example, demographic information, academics qualifications and experience level, work environments and motivation etc. The survey questionnaire by design was standardized, making it easier to compare the responses from the various respondents (Dadhe, 2016).

A core benefit of adopting the mixed method approach is the use of triangulation to increase credibility and validity of the research study by using the core strengths of both the qualitative and quantitative research methods. The adoption of this multi-method research design approach is used as a cross verification tool because the collected data is analysed independently and compared to see if they produce the same outcomes or findings. As aforementioned, this research study achieved triangulation was achieve by using and comparing the results from two different data collection methods and with a unique data analysis technique applied for each data collection method. For example, the quantitative survey questionnaire data was analysed by the researcher using descriptive statistics and the structured interviews data was analysed using thematic analysis. While both the qualitative and quantitative methods were used in this study, it is important to note that this research study leaned more towards the qualitative side (Basias and Pollalis, 2018; Johnson and Waterfield, 2004; Creswell, 2003).

The study used mixed method approach where the data qualitative and quantitative data were analysed separately, interpreted, and brought together to reach balanced conclusions. The collected data underwent quality check to determine response errors and unanswered questions, which resulted in the 121 received questionnaires being reduced to 87 complete questionnaires analysed in the study. The data obtained from the quantitative survey questionnaire was coded for various variables to be analysed using descriptive statistics, for example, central tendency, dispersion and distribution, and inferential statistics with aid of the “R” statistical software. Inferential statistics were conducted through independent t-tests to compare the means of variables and grouping of the participants who are considering emigration i.e., positive emigration potential, and those who are not considering emigration i.e., negative emigration potential, to propose effective retention strategies (Saunders et al., 2009). The survey questionnaire provided the researcher with a greater diversity of views on the topic being researched.

A combination of descriptive statistics of transformed data and manual thematic analysis and was used to analyse the data obtained from the interviews. The thematic analysis involved the identification, coding, categorizing, analysing of the data, reporting and accurately interpreting patterns (Saldana, 2009; Kothari, 2004).

3.8.1 Computers in Data Analysis

Computers have become a cornerstone in research because of their ability to store a large amount of information, process it and retrieve it with ease. Different tasks are done using computers in research, for example, developing of data collection instruments like interview questions and survey questionnaires, and distributing them to potential participants through electronic email. Researchers also execute other tasks like reading articles and resources for the literature reviews and using special software packages to do statistical analysis during the data analysis phase.

3.8.2 Quantitative Analysis Using Computers

Some of the common statistical analysis software packages are SPSS, “R”, MATLAB, and Microsoft Excel, which are used to calculate sample size, standard deviations, and analysis of variance (Nzeru, 2020). In this study the data obtained from the quantitative survey questionnaire was coded for various variables to be analysed through descriptive statistics. For example, the mean, median and mode commonly referred to as central tendency, dispersion and distribution were analysed using the “R” statistical software and Microsoft Excel. The use of descriptive statistics was chosen to gain insights into the key features of the data and highlight potential relationships between different variables which enables researcher to make accurate observations and conclusions. As t-test do not have a minimum sample size requirement, the researcher conducted independent t-tests on the pull and push factor section of the questionnaire to compare the means of the participants who are considering emigration i.e., positive emigration potential, and those who are not considering emigration i.e., negative emigration potential, to propose effective retention strategies (Saunders et al., 2009). ANOVA F-tests were also done for the responses in this section of the questionnaire i.e., pull and push factors, understand how the different emigration potential groups responded. The survey questionnaire provided the researcher with a greater diversity of views on the topic being researched.

3.8.3 Qualitative Analysis Using Computers

More researchers are now turning to computers to conduct qualitative data analysis using software packages like NVivo, MAXQDA, hyperRESEARCH and ATLAS.ti (John and Johnson, 2020). These software packages assist with content analysis, coding, text interpretation which saves time. While an effective tool, Morison, and Moir (1998) caution against blindly using software packages for qualitative analysis and to consider this wisely as these programs can alter the analytical process without a sign.

The thematic analysis for this study was conducted manually with no use of computerised thematic analysist software packages. The thematic analysis method used was the “top down”, theoretical thematic analysis method resulting in the generation of theoretical maps. This was done by initial data familiarization of the transcribed interviews, followed by data coding, and subsequent thematic interpretation of the data set. Data familiarization entailed reading through the 25 transcribed interviews and highlighting extracts and taking down notes on Microsoft Word to capture on emerging patterns. After data familiarization was complete, the data set was then coded using the conceptual research framework developed and discussed in the Literature Review chapter, 2. The similarities and differences of emerging patterns and that of the expected relationship from the theoretical framework was also noted. The emerging patterns or themes were then interpreted in relation to the selected theories as explained in the theoretical framework of the study (Braun and Clarke, 2006). Thus, while within the study boundaries set in the theoretical framework, the final recommendations were derived from the findings which emanated from the data analysis results.

3.8.4 Interrelation and Comparison of Qualitative and Quantitative Analysis using Computers

In this study, data analysis was done separately and interrelated and compared to obtained credible outcomes. The use of computers was at the heart of this study. After transformation of the qualitative data set into quantitative data using Microsoft Excel, the descriptive trends from the two data sets were put side by side for accurate and detailed comparison. The results emanating from the sections of the qualitative data set that underwent thematic analysis using Microsoft Word and was also compared to the results obtained from the analysis of the quantitative data set.

3.9 Validity and Reliability

3.9.1 Validity

The way the questions on the questionnaire are designed formulated will greatly impact the response rate, validity, and reliability of the study. Validity deals with ensuring that the questions asked are relevant to the research questions that need to be answered. Differently put, whether these are the best questions for the research hypothesis, or not (Bourke, Kirby, and Doran, 2016). Internal validity is the extent to which the research outcome truthfully represents a research subject and therefore deals with the accuracy of data collection (Khawaja, Haim, and Dileep, 2012; Saunders, Lewis, and Thornhill, 2009;). External validity is about the ability of the researcher to generalize the research through analytic generalizations and case to case transfers (Saunders et al., 2009; Miles & Huberman, 1994 - as cited in Onwuegbuzie and Collins, 2007). Reliability is about consistency in data collection which will result in consistent findings when the research is conducted by a different researcher or on a different sample (Saunders, Lewis, and Thornhill, 2009; Kothari, 2004). Researchers such as Bourke, Kirby, and Doran (2016) and others further describe the four measures of research validity as below:

a) Content validity:

This measure of validity determines whether the questions asked to the participants adequately covered the full scope of what the study sets out or aims to achieve. In this study, this was achieved by developing the questionnaire after a thorough literature review to ensure that all the important aspects in the study were well covered. Respondent validation and having an audit trail and triangulation increased the internal validity of this research study (Johnson and Waterfield, 2004; Creswell, 2003).

b) Criterion-related/Predictive validity:

This measure of validity deals with ensuring good correlation between data collection tools used in this study and the data collection tools used in previous studies with a similar criterion. This is to ensure that the questions in the survey and interviews will measure what they are intended to measure. The questions in the study were constructed by the researcher in a manner that ensured they made accurate predictions of the specified criterion, for example, emigration potential, impact of work motivation and push pull factors on propensity to emigrate etc. The questions were free from bias and relevant to the research study (Saunders, Lewis, and Thornhill, 2009).

c) ***Construct validity:***

This measure of validity deals with the characteristics or concepts that cannot be directly observed for measurement and are therefore observed and measured indirectly through other indicators, for example job satisfaction, fairness, freedom of speech, gender equality, depression etc. A characteristic like depression can be measured through observation of signs or indicators like fatigue, overeating or loss of appetite, hopelessness and pessimism, trouble with concentration and memory to name a few (Bruce, 2021). The questions were carefully reviewed to ensure that they contained the relevant indicators that will meet the objectives of the study.

d) ***Face Validity:***

This measure of validity deals with the layout and appearance of the questionnaire and whether it tests what it says it will test. The researcher ensured that the layout was logical, that the purpose and introduction was clear and that the questions were relevant with regards to the objectives of the study.

3.9.2 Reliability

Reliability is important for all research work and has been extensively encouraged and described by quantitative researchers, more than the qualitative researchers, to ensure research vigor. The definition of research reliability has the below 3 cornerstones:

(i) Are the study results consistent over a time?

(ii) Can accurate generalization be made i.e., do the results accurately represent to views or opinions of the populations at large?

(iii) Can the study be replicated using the same or similar research methodology?

A reliable research study will answer the above questions positively (Joppe - as cited in Bashir, Afzal and Azeem, 2008). Reliability therefore deals with ensures that the questions asked are clear and easy to understand so that the research is accurate and repeatable and/or consistent over time. For example, a thermometer must show the same temperature, or be within the instrumentation error, when readings when repeated for it to be reliable. Two type reliably exist i.e., internal, and external reliability. Internal reliability is essence ensures that the research has capture enough items or questions to adequately measure the intended constructs and concepts to research accurate research conclusions. External reliably on the other hand deals with the extent to which results of measuring instrument can be replicated from the research study to another i.e., will the research instrument reach the accurate generalizations that can be used beyond the scope of the current study. The various type of analysis used to measure internal and external reliability are shown in Table 3.7 below.

Table 3.7: Different types of internal and external reliability analysis

Category	**Types of analysis**	**Description of analysis**
Internal Reliability: It assesses the consistency of results across items within a test. By dividing into two parts, it will show a similar result or not.	Average inter-item correlation	Mean of all correlation of a correlation construct
	Average item total correlation	Mean of total correlation of each item
	Split-half correlation	Correlation between split-half scores of a construct
	Cronbach's alpha	Correlation between all possible split-half scores of a construct

<table>
<tr><td rowspan="3">External Reliability:

It refers to the extent to which a measure varies from one use to another. The analysis should show a same result time after by using the same test.</td><td>Test-retest reliability</td><td>Correlation between measures of one test at two different times.</td></tr>
<tr><td>Parallel form reliability</td><td>Correlation between two tests at same point of time</td></tr>
<tr><td>Internal reliability</td><td>Correlation of results of different observer doing same test</td></tr>
</table>

Source: Jain and Angural (as cited in Nawi, Tambi, Samat and Mustapha, 2020)

In this research study, reliability was obtained by ensuring that the both the questionnaire and interview questions were concise, free from ambiguity. The researcher also ensured that the interview questions were relevant and within capability of the interviewees to answer. To reduce variation and strengthen consistency, the questions asked in the survey questionnaire and interviews were the same for all participants. This will ensure that the study can be replicated by other researchers when conducted under the same conditions (Bourke, Kirby, and Doran, 2016; Bashir, Afzal and Azeem, 2008; Kothari, 2004). Internal consistency was improved through effective review and modification of the quantitative and qualitative questions to ensure they would be reliable. The internal reliability of the quantitative survey was measured using the Cronbach Alpha Coefficient analysis for the different sections of the questionnaire. The rule of thumb criteria, which is based on strength, was utilized to confirm internal consistency as shown in Table 3.8 below, where a coefficient less than 0.6 is considered poor and therefore unreliable because it will impact the validity of the date. Common reasons for a low Cronbach Alpha coefficient are:

(i) Too few items on the data collection instrument.

(ii) The items on the data collection instrument are too diverse resulting in poor interrelatedness between the items (Paulsen, 2016; Jain and Angural, 2017).

A high Cronbach Alpha values does not always mean the instrument has a high degree of internal consistency because of the questions being redundant i.e., asking the same question in a different way. A maximum Cronbach Alpha values of 0.9 has been recommended byTavakol and Dennic (2011).

Table 3.8: Cronbach Alpha coefficient size

Alpha Coefficient Range	**Strength of Association**
< 0.6	Poor
0.6 to < 0.7 Moderate	0.6 to < 0.7 Moderate
0.7 to < 0.8 Good	0.7 to < 0.8 Good
0.8 to < 0.9 Very Good	0.8 to < 0.9 Very Good
0.9 Excellent	0.9 Excellent

Source: Adapted from Hair Jr et al. (as cited in Paulsen, 2016); Nawi, Tambi, Samat and Mustapha (2020)

As aforementioned, the survey questionnaire was divided into 5 sections. The Cronbach Alpha coefficient was determined only for the questionnaire sections that had Likert scale questions with different concepts in Sections 2, 3, 4 and 5 of the survey questionnaires. For the section covering biographic details, the Cronbach Alpha analysis could not be done. As aforementioned, the survey questionnaire was divided into five sections shown in Table 3.9. All the survey questionnaire topics, each measuring a different concept and/or construct, had either a good or very food strength of association apart from the barriers to emigration topic which had a moderate strength of association.

Table 3.9: Cronbach Alpha Coefficient analysis results for the different sections of the survey questionnaire

Study Research Section	Survey Questionnaire Topic	Alpha Coefficient Range	Strength of Association
Section 1: Biographic Details	Biographic details of respondents	N/A	N/A
Section 2: Emigration Potential and Barriers	Emigration potential for working abroad	0.81206809	Very Good
	Barriers for working abroad	0.61110454	Moderate
Section 3: Push-Pull Factors	Push factors to emigrating	0.87263446	Very Good
	Pull factors to emigrating	0.74829816	Good
Section 4: Work Environment	Current work environment	0.80 (0.79719)	Very Good
Section 5: Retention	Retention of employees	0.83018558	Very Good

Source: Author

3.9.3 Trustworthiness

Trustworthiness in Quantitative research is dealt with by establishing and confirming reliability and validity in the study. In qualitative research this is the to the extent to which the findings from the study are accurate, authentic, and truthful to ensure that these findings are credible, dependable, confirmable by ensuring the findings are neutral and free of bias in that they are reflection of the views and opinions of the participants and not that of the researcher(s), and transferable in that they can be applied to other situations and contexts beyond the study. (Polit and Beck - as cited in Direko and Davhana-Maselesele, 2017; Robson and MacCartan, 2016)

Table 3.10 shows the preventative measures that researchers can employ to ensure that their research is trustworthy (Polit and Beck - as cited in Direko and Davhana-Maselesele, 2017)

Table 3.10: Application of measures to ensure trustworthiness.

Strategy	Application
Credibility	• Prolonged engagement with the participants was used by the researcher in presenting self for conducting the interviews. The inquiry was neutral, and enough time was given to the participant for self-expression, according to Brink, Van der Walt, and Van Rensburg (2012). • Non-verbal communication was always observed. • Member checking was done by repeating conclusions and interpretations for the participants to confirm. • Peer reviews were done by two experts in the field of qualitative research to ensure the value of truth.
Transferability	• Triangulation was used by converging the qualitative and quantitative data which were collected concurrently, from different samples of participants. • A dense description of data was supported by direct quotations from participants and a literature control to assess applicability (De Vos et al., 2011).
Dependability	• The researcher spent time with the participants until there was saturation of information. Audiotape recording was done, and transcripts of the recordings and the tapes safely stored. • Triangulation with concurrent quantitative data also promoted consistency. • The peer review done by two experts in qualitative research added to dependability.
Confirmability	• Neutrality was enhanced by triangulation of data according to the research design (Creswell, 2012). • Informed consent was obtained from the participants, and freedom of expression encouraged (Brink et al., 2006:119). • The findings were supported by a literature control.

Source: Polit and Beck (as cited in Direko and Davhana-Maselesele, 2017)

3.9.4 Bias

Bias is an important part of research that needs to be well understand to that it is effectively addressed because, it can threaten the study's trustworthiness and validity and significantly skew the research findings through errors in inference and or misinterpretation. While bias cannot always be eliminated, it is important to minimize it in every level of research where it can be present in the form of the researcher's background, and cultural views, participant selection bias, and flawed data collection methods. Bias is independent of sample size and statistical analysis and can cause estimates of association to be greater or smaller than the true association (Polit and Becker, 2018; Creswell, 2014; Smith and Noble, 2014; Pannucci and Wilkins, 2010).

a) **Sample Selection Bias:** This bias will occur when participants who have already indicated their desire to emigrate are selected. This bias will be overcome by using simple random sampling.

b) **Data Collection Bias:** This was not a factor because the researcher was the only person who conducted the interviews themselves.

c) **Interviewer Bias:** The researcher reduced interviewer bias by not asking leading questions that resonate from their personal experience in the petroleum refining industry.

d) **Data Analysis Bias:** This bias occurs when the researcher unknowingly focusses on data that supports their desired or preferred research outcome(s) or data that is consistent with the cultural and/or religious beliefs. During this study, the research was aware of this potential bias pitfall during data analysis through increased self-awareness.

3.10 Ethical considerations

Research ethics are defined as the appropriateness of the researcher's behaviours in relation to the rights of the participants in the study and those affected by it and can be achieved by avoiding deception, obtaining voluntary participation and informed consent, explaining the benefit of the research to the participants, respecting the right to privacy, confidentiality, and anonymity (Cooper and Schindler, 2014; Saunders, 2009). Research ethics therefore deal with ensuring that all humans involved in the study are dealt with respectfully, and without harm. Any data collected for the purposes of the research needs to be stored safety and destroyed after a reasonable time has passed. In addition to confidentiality, research ethics ensure that all participants who choose to participate in the study do so willingly with the option to terminate their participation at any time. The below aspects were covered to ensure the research study did not cross any ethical boundaries (Wagle, 2020).

a) **Benefit:** The researcher explained the benefit to participants and organisations without overstating or understating them.
b) **Voluntary participation and informed consent:** Participation in the study was voluntary. The researcher, in writing, explained the objectives of the study and requested that all participants provide informed consent for the questionnaires and recorded verbal agreement for the interviews.
c) **Harm to participants:** The privacy of the participants was respected. To avoid discomfort or embarrassment, no personal questions were asked in the questionnaire and interviews.
d) **Anonymity and Confidentiality:** The names of the participants have only been used for generalization of the study findings and were mentioned in the study.
e) **Scholarly Integrity and Deception**: The researcher ensured that scholarly integrity is always maintained by avoiding fabrication and plagiarism (Saldana, 2009). The researcher did not use deception to achieve a higher response rate (Cooper and Schlindler, 2014)

3.11 Chapter Summary

Research has been defined by various researchers through different lenses, it can broadly be defined as the detailed study of a subject and/or using existing knowledge in a new way to generate new concepts and gain a new understanding in a critical, objective, and reliable way. The aim of a research study is to have an understand the emigration potential of current engineers working in the South African petrochemical industry, understand the brain drain threat and developing strategies to reduce emigration potential of these engineers.

The critical realist philosophy was used in this study to understand the extent of the potential skills loss by measuring the emigration potential of current staff. Furthermore, the study used the inductive approach where the theory and solutions were derived from the data analysis results. The mixed method approach was used where the qualitative and quantitative data were analysed separately, interpreted, and brought together to reach balanced conclusions. Triangulation was achieved by using of different data collection methods i.e., a quantitative survey questionnaire and structured interviews, and by using two different data analysis techniques i.e., diversity analysis for the questionnaires and thematic analysis for the interviews. A strict ethical code is followed throughout the study as required by the University of KwaZulu-Natal ethical code and code of conduct. The ethical clearance was granted for this study against study code HSS/1774/016D.

CHAPTER 4: QUALITATIVE DATA PRESENTATION

4.1 Introduction

The previous chapter 3 gave a detailed explanation of the research procedures, from cradle to grave, which are to be used in this study and provided the reason for their selection and adoption. As mentioned in previous chapter, the qualitative data will be analysed using a combination of methods which are thematic analysis and descriptive analysis of transformed qualitative data. This chapter presents results emanating from the qualitative data set i.e., data obtained from the interviews conducted. The interviews, which was the primary data collection method, were conducted on 25 participants. The interviews underwent thematic analysis using the techniques developed by Braun and Clarke (2006). The qualitative data was also transformed to quantitative data set by undergoing coding, counting prior to being entered into Microsoft Excel for further processing and descriptive analysis to understand the emigration potential of the engineers, the critical factors that influence emigration of the participants with a positive and moderate emigration potential. The data analysis approach for the qualitative interviews has similarities to that used by Direko and Davhana-Maselesele (2017).

4.2 Thematic Analysis

After conducting an extensive review of literature and the authors experience working in the refining industry Theoretical Analysis Method was chosen (top down) to analyse the migration theory and work environment and employee motivation sections of the qualitative data set. The theoretical framework discussed in section was developed this study which would use various theories to answer the research questions i.e., the Neoclassical Economic Theory, Push and Pull Factor Theory, Adam's Equity Theory, Hertzberg's Two Factor Theory, Vrooms Expectancy Theory, Job Redesign, Lawler's effort-performance expectancy and performance-outcome theory.

The thematic analysis technique used was that of Braun and Clarke (2019, 2006) which involved the following steps: (1) Data familiarization which involved reading through all the interviews several times (2) Identification of codes using a combination of latent and semantic coding techniques (3) Constructing the core or main themes in relation to the research questions. (4) Reviewing and refinement of the core themes. (5) Defining and name the theme groups. (6) Tabulation of the themes. (7) Reporting of the findings.

Table 4.1 summarises the codes generated during the thematic analysis process and well as the themes constructed by the Author and their links to the various applicable theories identified in the conceptual framework of the study. Some codes were double-coded due to them being used as both semantic and latent codes. The constructed themes of this study captured the central concept in relation to the research questions and was not based on solely on quantitative recurrence.

Table 4.1: Summary of Codes and Themes and links to the Applicable Theory

No.	Initial Latent and Semantic Codes	Theme/Central Concept	Focus Area based on Literature Review	Applicable Theory
1	Unclear Career Paths	Lack of Promotions	Growth and Career Advancement	(5) Maslow's Hierarchy of Needs (8) Job Redesign.
2	Interesting Work & Good Training			
3	Good Manager Support	Employee-Manger Relationships	Interpersonal Factors	(3) Adams equity Theory (6)Vroom's Expectancy Theory (9)Lawler's effort and & outcome theory
4	Bias and Favouritism in Performance Reviews			
5	Inclusion and Diversity			
6	Work overload and Work Stress	Poor Mental Health and	New Focus Area	(10) Quality of Work Life

7	Flexitime and Remote Working	Work-Life Balance		
8	Higher Cost of Living	Deteriorating Living Conditions	Migration Factors	(1) Neoclassical Economic Theory (2) Push and Pull Theory
9	Rising Debt			
10	Weak Rand			
11	Crime and Poor Governance			

Source: Author

4.2.1 Theme 1: Lack of Promotions

This theme of poor or a lack of promotions and future promotions opportunities came for strongly in the data set and was underpinned by two sub-themes which centred around: (1) Career paths and (2) Manager bias and favouritism in the performance appraisals process and during the distribution of recognition awards which affects promotion opportunities. The lack of career paths was the main issue between the two, as many of the interviewed engineers expressed that the current career paths were either limiting in that they only catered for managerial progression, and not technical progression or they were flat with only three to four levels between the engineer and the Refinery General Manager. By implication, this mean that all subordinates were completing for a single position, which would only come to fruition if their direct line manager resigned, retired, or died and had to look for growth opportunities outside of their organisation.

On the contrary organisations that had clear career paths, that catered for both managerial and technical career progression paths which were effectively utilised had engineers who were more optimistic about their career growth opportunities, as seen in the excerpt below from one of the interviewees.

> "Yeah, there's a lot of growth opportunities. But it looks like now I'm in a stage where probably I would have to move to management. Although I'm a lead engineer right now, but probably the next step would be more like managerial.

> And I'm still not sure if I really need to go managerial or just follow the specialist route."

While another engineer has this to say:

> "Really limited. No opportunities for promotion and the structure is a bit flat."

The engineers were very happy about the technical training they receive. A participant shared the following view when discussing their growth opportunities:

> "Well, the technical side or the technical exposure is great. My only concern, again, are leadership concerns. But more than that, I do have a concern around the lack of clarity around my career growth & potential possibly to be specific within the company."

This main sub-theme required both Manager and human resource department intervention, to resolve or improve. An important observation was that, while frustrated by the lack of career progression, the majority the engineers were happy with the technical training they received and found their work challenging and interesting.

Link to Theory: This theme links strongly to the Maslow's Hierarchy Theory where the needs of the engineer's centre around the higher levels of the hierarchy i.e., the needs of esteem and self-actualisation. There is also a link to the job redesign theory where companies with the flat organisational structure may look at options of horizontal growth instead of vertical growth to counteract feelings of stagnation by being in the same role for longer than 5 years.

4.2.3 Theme 2: Employee-Manager Relationships

The employee-manager relationship was the second theme that was constructed from the data set and came forth strongly. For this theme most of the engineer had good relations with their manager, which was primarily due to the good support they received form their manager in terms resolving work challenges. While the overall personal relationship was good, there were two areas of discontent with their managers raised by the engineers, which were: (1) Bias and Favouritism in Performance Reviews (2) The lack inclusion and diversity in the workplace.

Favouritism shown by the manager during the performance appraisal process was a sore point for the engineers because, they perceived the existing PA process to be subjective which afforded managers the opportunity to utilise the process as a reward or punishment tool; where engineers they liked were rewarded with good PA scores and employees that disliked were punished by receiving less favourable PA scores. The second aspect is that of bias due to clients, often with competing KPI's, having a major influence on the PA score where PA methods like the 360-degree feedback survey were used. One of the interviewed engineers shared these thoughts when asked if they thought the performance appraisals process was fair:

> "It's not fair based on your function, generally the inspection department's primary function is not to make the client happy with regards to customer satisfaction. But it's to ensure compliance to the regulatory codes and standards. Now imagine you must tell this individual from Operations Department who wants to start up the plant, that they can't because this and this still must be done. So generally, I think it's a bit compromising, knowing that at the end of the day, your performance bonus is based on what service you give to this guy because, he has the final say to your final bonus."

The case of bias due competing roles and competing objectives and inaccurate PA scores to manager favouritism highlights a fundamental weakness in the performance appraisal process that needs to be resolved.

With regards to inclusion, employees, especially the Senior Technical Person would like the opportunity to express their technical opinions and to reduce the reliance on external engineering consultants for important technical decision making. The younger engineers desired for their view and opinions to be acknowledged and taken seriously because, at times their suggestions and views in meetings get brushed off – until a more senior person says the same thing and they get praised for their contribution.

Since the end of apartheid, and the dawn of the South Africa, diversity and an inclusive work environment was always going to be an important factor. It is therefore not surprising that diversity was a sub-theme in this study. In this regard, the engineers felt that promotions and recognition awards were distributed along friendship or clique lines. Also, companies did not enforce inclusive business language policies, primarily English, during formal meetings leaving engineers who did not understand the language being spoken feeling excluded.

Link to Theory: The theories that pertain to this theme are Adams equity Theory and Lawler's Effort and & Outcome Theory, where the lack distributional justice in the performance appraisal and recognition awards program was concern as this can contribute to hygiene factors resulting in demotivation, work dissatisfaction as per Hertzberg's Two Factor Theory.

4.2.4 Theme 3: Poor Mental Health and Work-Life Balance

The third theme constructed related to the poor mental health and lack of work-life balance. Most of the engineers who were interviewed complained about the high levels of stress due to short deadlines for new targets, unrealistic expectations from their direct line managers. The main cause for this, according to the engineers, was due to: (2) Line managers not fully understanding the work steps required to complete the task due them being too far or detached form the day-to-day work activities and (2) Often the managers weren't specialist in the roles were managing and therefore inexperienced to fully comprehend the amount of time required to complete tasks. The combination of limited resources and limited time in which to complete their work tasks resulted in engineering feeling overloaded and having to take work home to complete, which consumed the time meant for their family.

The above-mentioned stress and work overload was the biggest contributor to engineer's feeling of poor work-life balance. To better integrate their work life and personal life, they expressed the need for the option to work from home once a week (remote working) and a more flexible working times, using 09:00am - 15:00pm as core business hours where for example, they could start work at 09:00pm to 18:00pm or 06:00am to 15:00pm.

The two sub-themes of work-related stress and work-life balance were interlinked which both required HR and Manager interventions. Manager intervention is required for better workload management and HR intervention is required with reviewing the current benefits offering to consider incorporating flexitime and/or remote working or adjustment to shift work schedules. The mental health of engineers is crucial to their productivity and decision making and should be addressed with urgency.

Link to theory: The main theory that links to this theme is the quality of work life theory.

4.2.6 Theme 4: Deteriorating Living Conditions

The fourth theme pertaining to the deteriorating macroeconomic environment, was the only theme that was not part of the direct work environment. The engineers expressed concerns mostly around the rapidly inflation and consequent rising food prices and cost of living which results in reduced disposable income. The second factor that reduced the disposable income and caused much anxiety around the increasing interest rates from the South African Reserve Bank which increases the interest rates on debt, for example house loans, car loans, credit cards.

While most of the engineers expressed satisfaction with their salaries, the Rand (ZAR) weakening against major currencies like the USD and the Euro, and the subsequent higher earnings abroad was sparking the idea of emigration.

In terms of day-to-day life outside of work, concerns raised were mainly around the high levels of violent crime and poor governance due to corruption and poor service delivery.

Link to theory: The main or primary theory that link to this theme is the Push and Pull Factor Theory and the secondary theory is the Neoclassical Economic Theory.

4.2.7 Finalised Thematic Analysis Map

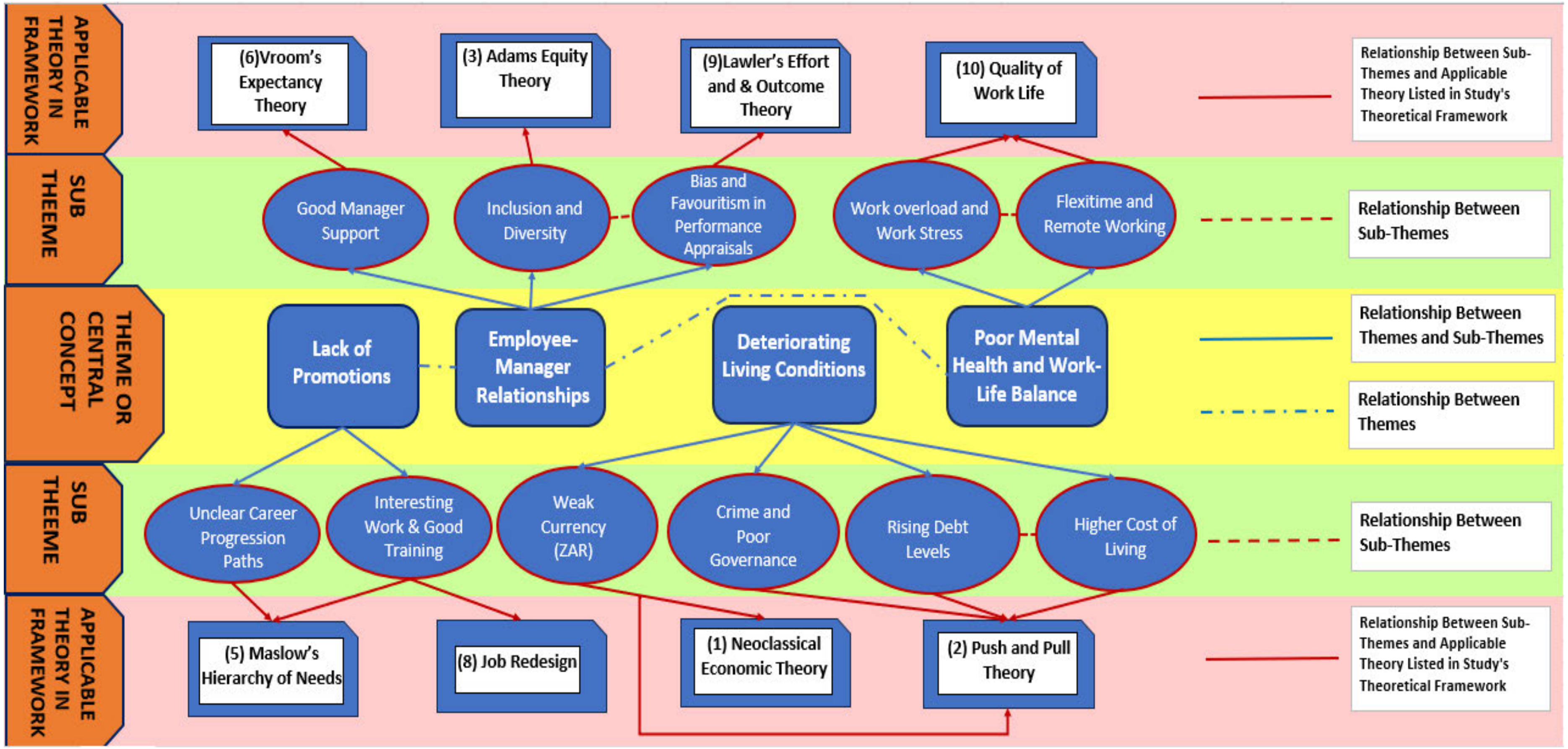


Figure 4.1: Shows the Thematic Analysis Map for the Study

4.3 Descriptive Statistic from Transformed Data

Descriptive statistics using Microsoft Excel were conducted on the collected interview data and presented as a combination of tables, bar graphs and pie charts.

4.3.1 Emigration Potential

The first objective of this study was to determine emigration potential:

Research Objective 1: Determine the emigration potential of current engineering professionals in the South African petrochemical industry. The research question to achieve this objective is below:
Research Question 1: What is the current emigration potential amongst engineering professionals in the South African Petroleum sector?

The topic of Emigration potential was covered by question 1-10, in Section 2, of the interview guide. The results from the interviewee responses are shown in Table 4.2 below. Table 4.2 shows that 22 (88%) of the 25 interviewees indicated that they had given thought to working abroad, with all of them (100%) having close friends who currently work abroad. 14 of the 22 (64%) who have thought of working abroad, have taken, and are still taking active steps to making this thought a reality, by applying for jobs.

Table 4.2: Data Summary from interviews

	Age (Years)	Marital Status	Years' Work Experience	Engineering Discipline	Have you given any thought to working in the abroad?	Where would be your country of choice for working abroad	Have you taken any steps towards making this thought a reality	Do you have any close friends who are currently working abroad	How often do you discuss the possibility of working abroad with your family and friends?	How likely is it that you will move in the next 2 years?	If you were to work abroad, how long would you consider staying?	Do you have any barriers that prevent you from working abroad?
Interviewee 1	47 Years	Married	22 Years	Chemical	Yes	New Zealand/Middle east	No	Yes	Once a week	70%	Permanently	Yes, Child in Grade 12
Interviewee 2	31Years	Single	10 Years	Mechanical	Yes	Africa (rotation)/Middle East /Australia	Yes	Yes	Once a Week	80%	5 years	No
Interviewee 3	48 years	Divorced	20 Years	Chemical	Yes	Europe/ USA	No	Yes	Once a Year	30%	2 Years	No
Interviewee 4	42 Years	Married	16 Years	Chemical	Yes	Netherlands, UK, UAE	Yes	Yes	Once a Month	50%	10 years	No
Interviewee 5	29 Years	Single	9 Years	Mechanical	Yes	West and Central Africa (rotation - Closer to home)	Yes	Yes	Twice a Month	70%	10 years	No
Interviewee 6	28 Years	Single	8 Years	Mechanical	No							Children - Not willing to leave them

Interviewee 7	32 Years	Single	7 years	Electro-Mechanical	Yes	Denmark/Germany (Renewable Energy Programs)	No	Yes	Once a Year	70%	5 years (Max)	No
Interviewee 8	30 years	Single	5 Years	Mechanical	Yes	Europe/ North America (lifestyle) /Middle East (Experience)	Yes	Yes	Once a Month	90%	5 years	No
Interviewee 9	28 Years	Single	6 Years	Mechanical	Yes	Angola (Rotations)	Yes	Yes	Once a month	80%	Permanently	No
Interviewee 10	35 Years	Married	11 Years	Mechanical	Yes	Saudi Arabia	Yes	Yes	Twice a Year	40%	5 years	None
Interviewee 11	37 Years	Separated	15 years	Mechanical	Yes	Germany/Europe	Yes	Yes	Once a Quarter	70%	Permanently	Family
Interviewee 12	40 Years	Single	15 years	Civil	Yes	Anywhere excluding Nigeria	Yes	No	Not Often/once a year	Highly Likely	25 years (up to Retirement)	
Interviewee 13	35 Years	Single	11 Years	Mechanical	Yes	Saudi Arabia/East Asia	Yes	Yes	Once a Month	80%	Permanently	No
Interviewee 14	31Years	Single	12 Years	Mechanical	Yes	Saudi/Angola	Yes	Yes	Once a Month	70%	5 years	No
Interviewee 15	32 Years	Single	9 Years	Mechanical	Yes	Arab Countries	No	Yes	Twice a year	50%	15 years	No
Interviewee 16	35 Years	Married	14 Years	Chemical	Yes	Europe	No	Yes	Twice a year	20%	10 years	Not financially independent yet

Interviewee 17	34 Years	Married	7 Years	Metallurgical	Yes	Canada	Yes	Yes	Once a Month	100%	Permanently	No
Interviewee 18	35 Years	Single	14 Years	Electrical	Yes	Asia/Europe	Yes	Yes	Once a Month	60%	5 years	No
Interviewee 19	40 Years	Married	18 Years	Metallurgical	Yes	Saudi Arabia	No	Yes	Once a Quarter	50%	5 years	No
Interviewee 20	34 Years	Married	13 Years	Mechanical	No	-	-	-	-	-	-	-
Interviewee 21	40 Years	Married	17 Years	Mechanical	No	-	-	-	-	-	-	-
Interviewee 22	35 Years	Married	11 Years	Mechanical	Yes	Saudi Arabia	No	Yes	Once a Month	100%	5 years	No
Interviewee 23	28 Years	Single	6 Years	Metallurgical	Yes	Middle East	Yes	Yes	Once a Month	80%	Undecided	No
Interviewee 24	34 Years	Married	11 Years	Metallurgical	Yes	UAE	Yes	Yes	Once a Month	80%	5 years	No
Interviewee 25	33 Years	Married	8 Years	Chemical	Yes	Middle East	No	Yes	Once a Quarter	60%	5 years	No

Source: Author

Emigration Potential and Criterion

The results of the emigration potential (EP) of the 25 interviewees, is shown in Figure 4.2, with the criterial explained below:

- **Positive EP:** The positive EP group are the interviewees who have given though to working abroad and are applying for jobs outside of South Africa. The results show that 56% (14) of the interviewees are currently applying for jobs abroad.
- **Moderate EP:** The moderate EP are the interviewees who have given thought to working abroad but have not yet taken active steps to make this a reality by applying for jobs outside of South Africa. The interview results show that 32% (8) fall in the moderate EP category.
- **Negative EP:** The negative EP group are the interviewees who have not considered moving abroad and have not applied for any jobs outside of South Africa. The interview results show that 12% (3) of the interviewees fall within this negative EP category.

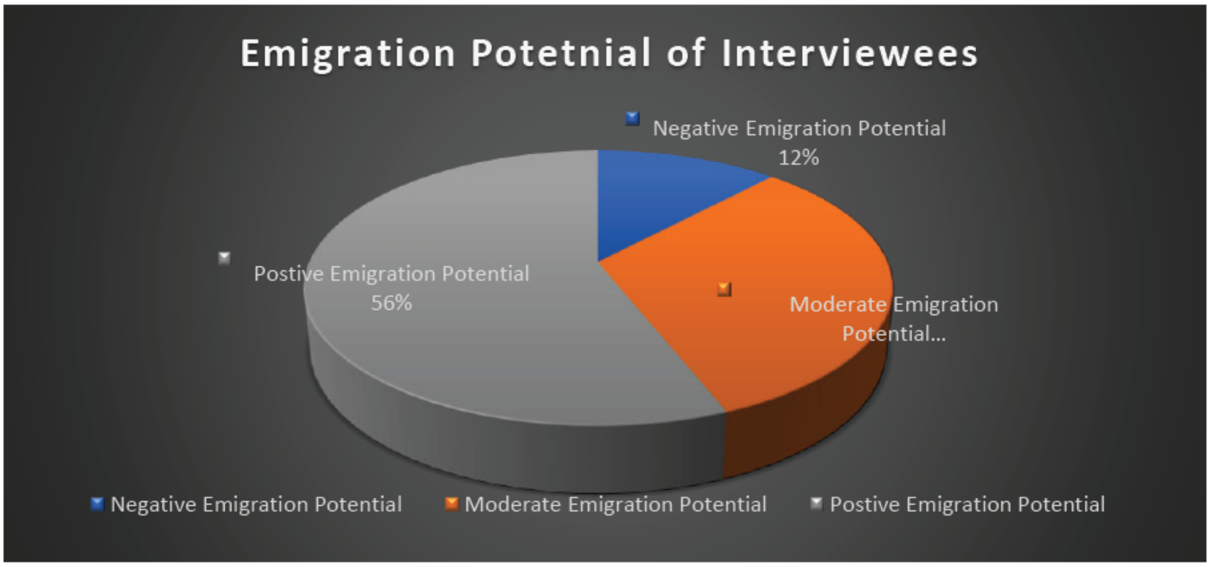


Figure 4.2: Emigration Potential of the Interviewees

When the positive and moderate emigration potential interviewees were asked how often they think about working outside of South Africa i.e., the frequency of thought given to working abroad, 45% (10) of the interviewees said they think about it at least once a month. The frequency of once a month, once a quarter and once a year each had 14% (3) of the responses, with the remaining 14% (3) interviewees unable to quantify the frequency of this thought.

Nature of Emigration

Plan to Emigration in 2-years

When the 22 interviewees with a positive and moderate emigration potential were asked to rank their likelihood to emigrate in the next two years, 59% (13) said they had a high likelihood of emigrating within the next two years, 32% (7) had a medium likelihood and 9% (2) had a low likelihood to emigrate in the new two years.

Desired host country or region

The 22 interviewees with a positive and moderate EP indicated the following regions as their preferred:

- Middle East: 41% (9)
- Europe: 36% (8)
- Africa: 14% (3)
- Australasia: 4.5% (1)
- Anywhere globally: 4.5% (1)

Duration of stay in host country

When the Positive and Moderate EP respondents were asked how long they intend to stay abroad, they expressed the following:

- 5 years: 45% (10)
- Permanently/Retirement: 27% (6)
- 10 years: 14% (3)
- 2 years: 4% (1)

- Undecided: 5% (1)

4.3.2 Demographical Profile

The second objective is to determine the societal structures, like the demographics of those wanting to emigrate.

Research Objective 2: To explore the demographic characteristics of the engineers who want to emigrate. The research question to meet this objective is:
Research Question 2: What are the demographic characteristics of the personnel who intend to emigrate?

The demographic profile was used to better understand the background of the interviewees by looking at some of their characteristic like gender, age, ethnic group, marital status, level of experienced etc.

Gender

The gender distribution of the 25 interviewees was 88% (22) male and 12% (3) female. The positive emigration potential group which had 14 individuals comprised mostly of males of 93% (13) with the females being 7% (1) as shown in Figure 4.3(a). The moderate emigration potential group had 8 individuals, also comprised mostly of males 75% (6) with females accounting for 25% (2) as show in Figure 4.3(b). Dissection of the emigration potential by gender showed emigration to be male dominated. This male to female ratio in the positive and moderate emigration potential groups was expected because 88% of the interviewees were male. What was a little surprising was that all females fell within these two groups with the negative emigration potential group containing no (0%) females. This goes against the traditional believe that women have a negative emigration mobility.

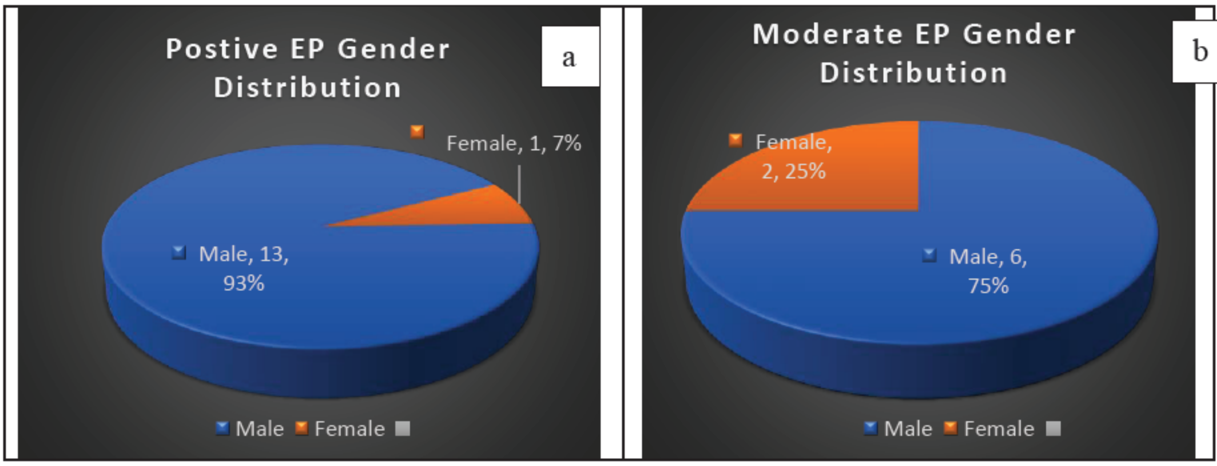


Figure 4.3: Gender Distribution of (a) Positive EP and (b) Moderate EP

Age

When looking at the age distribution of all 25 interviewees in Figure 4.4, the age range with the highest number of individuals were in the 31 – 35 age range in the positive emigration potential group and the moderate emigration potential groups. Analysis of the positive emigration potential group (14 individual) showed that 50% (7) of the individuals were between the ages 31-35, with the second highest age range of 25-30 years accounting for 29% (4) of the individuals in this positive emigration potential group. It was interesting to observe that the desire to work abroad was present early in the career life shown by this younger age, range of 25-30 years, having the second highest positive emigration potential. The emigration potential experienced a noticeable drop after age 36, with the 36-40 years age range having 14% (2) of the responses and the 41-45 years age range having only 7% (1).

The age breakdown of the moderate emigration potential group (8 individuals) shows that the 31-35 age range also ranked the highest with 62% (5) of the individuals is, followed by the 41-45 years age group with 25% (2) individuals and the 36-40 age group with 13% (1) individual. This group had no individual in the younger 25-30 age range.

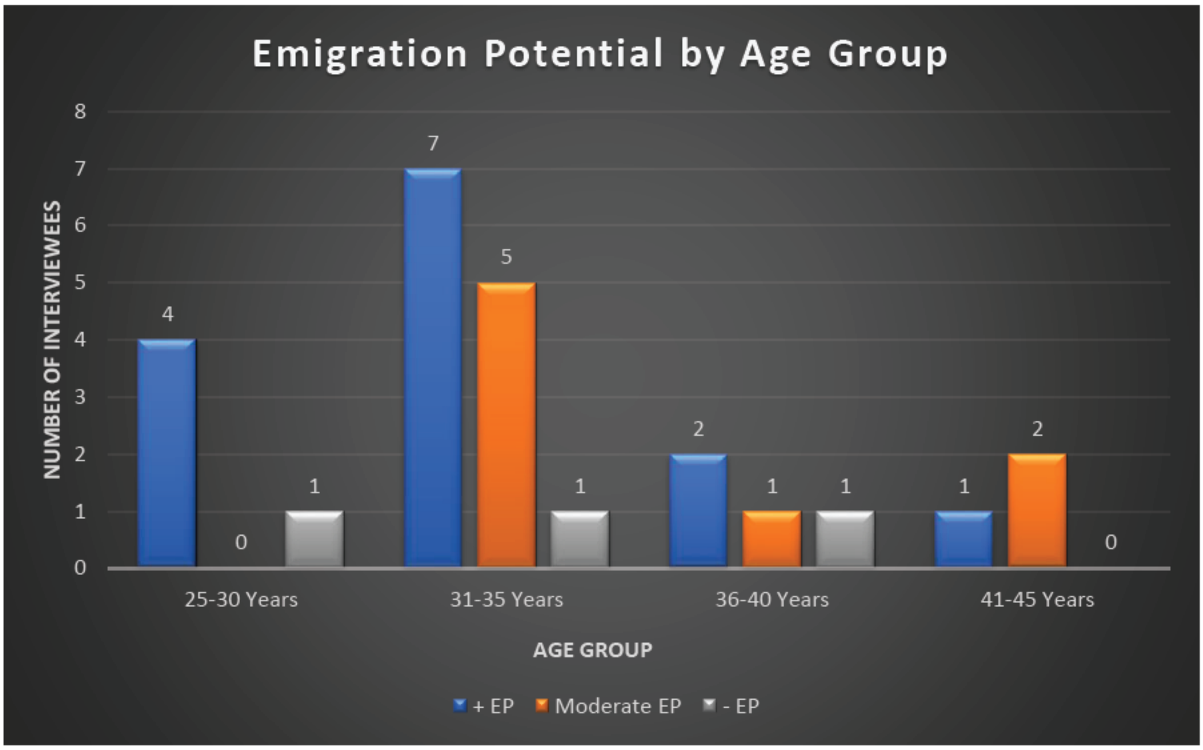


Figure 4.4: Emigration Potential Distribution by Age Group of Interviewees

Ethnic Group

The distribution of the 25 interviewees by ethnic group shows that that 80% (20) of the interviewees were of African descent, 4% (1) was Coloured and 8% (2) were White and 8% (2) were of Indian descent. As aforementioned, the positive emigration group consisted of 14 individuals in total. Analysis of the group EP positive interviewees showed that 86% (12) of this group were African, with the remaining 14% (2) being white. The interviewees with a moderate emigration potential comprised of 8 individuals with 62% (5) being African, 25% (2) being Indian and 13% (1) being Coloured. At was observed that even though the moderate EP group was African, it contained all the coloured and Indian interviewees who participated in this study.

Marital Status

The analysis of the 25 interviewees' marital status showed most of the interviewees to be single, closely followed by those being married. The breakdown of the marital status for the Positive EP and Moderate EP is shown in Table 4.3 below.

Table 4.3: Interviewee Emigration Potential by Marital Status

Marital Status	Total Interviewees	Positive EP Interviewees	Moderate EP Interviewees
Single	48% (12)	64% (9)	25% (2)
Married	44% (11)	29% (4)	63% (5)
Separated.	4% (1)	7% (1)	0% (0)
Divorced	4% (1)	0% (0)	12% (1)
Total	25	14	8

Source: Author

Level of Experience

The work experience bar chart for all 25 interviewees is shown in bar chart Figure 4.5 classified by emigration potential group. For the Positive EP interviewees, the bar chart shows that the two work experience levels with the highest peaks are in the 11-15 years' work experience with 50% (7) interviewees in this EP category and the 5-10 years' working experience level with 43% (6) of the interviewees. The 16-20 years work experience level has only 7% (1) of the responses.

The interviewees with a moderate EP were evenly distributed with the 5-10 years working experience level having 43% (3) which was the highest number of individuals in this EP category. The 11-15 years and 16-20 years experience level experience levels bad ~28% (2) responses. The greater than 20 years experience level had 12% (1) interviewee.

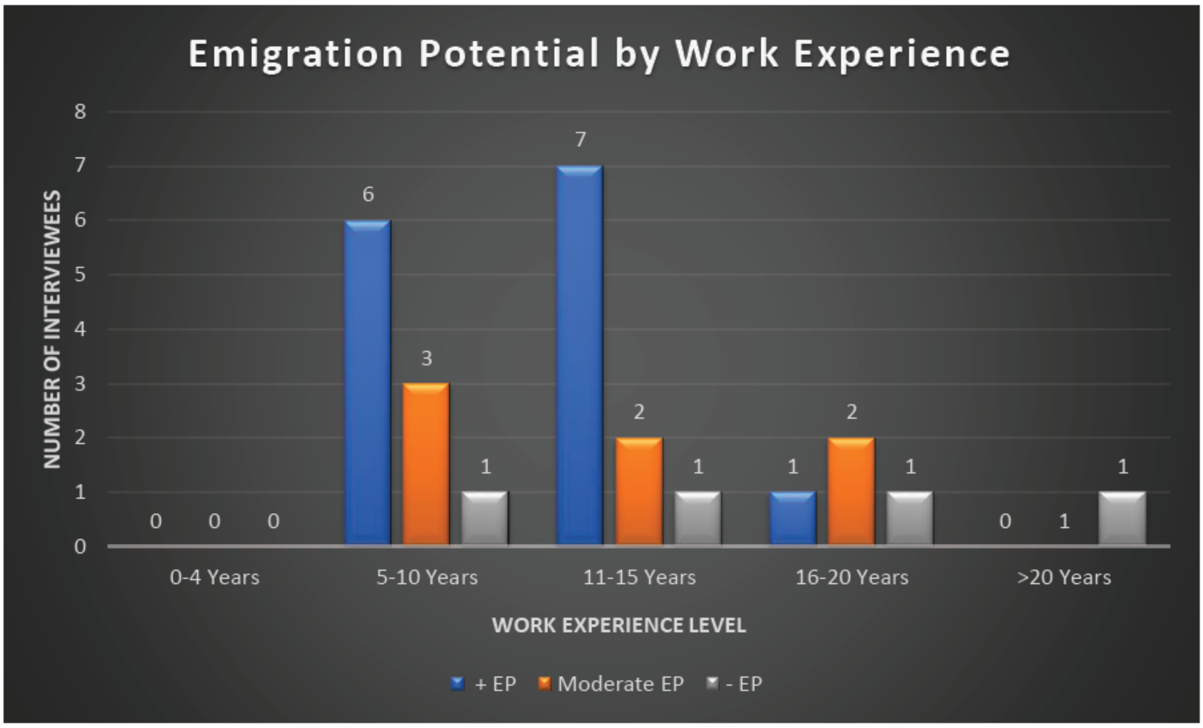


Figure 4.5: Emigration Potential by Work Experience of the Interviewees

4.3.3 Pull and Push Factors

The third objective was to identify the main factors that underpin emigration.

Research Objective 3: Identify the main factors contributing to current employees wanting to emigrate. The research question to meet this objective is:

Research **Question 3:** What are the critical factors that determine whether the employees will stay or leave?

The analysis of the push and pull factors focused on the 22 interviewees who had a positive and moderate emigration potential. The 3 interviewees with a negative emigration potential were not covered as the intent was to understand the underlying pull/push factors participants who have considered emigration. The interviewee responses are summarised in Table 4.4.

Political Factors

Interviewee responses to political factors are summarised below:

I. Politics not being factor in the desire to emigrate had 12 (54%) mentions.

II. Poor governance received 5 (23%) mentions, all of which were negative. Governance included themes like corruption, lack of strategic vision and poor project delivery which interviewees were very unhappy about.
III. Political stability received 3 (14%) mentioned. These were all positive due to a change of the president from former president Jacob Zuma to current president Cyril Ramaphosa.
IV. Transformation policies like affirmative action and BEE received 2 (9%) mentions.

Economic Factors

Interviewee responses to economic factors are summarised below:

(i) A higher salary due to higher wages abroad and weaker currency received 9 (41%) mentions.
(ii) The rapidly increasing cost of living and personal finance, for example, paying of debt and high interest rates charged by bank lenders and cost of living received 5 (23%) mentions. Special mentions were made to basic needs like food prices and petrol costs becoming increasingly expensive.
(iii) Economic push and pull factors not playing reason in the desire to move received 4 (18%) mentions.
(iv) High level of tax in South Africa received 3 (14%) mentions.
(v) The desire to be financially free and being debt free received 1 (4%) mention.

Social Factors

Interviewee responses to social factors are summarised below:

(i) Social factors not playing a role in the desire emigrate received 12 (55%) mentions.
(ii) The prevailing high levels of violent crime and hijacking in South Africa as a reason to emigration (push factor) received 5 (22%) mentions.
(iii) Social links in terms of being closer to family and friends abroad as a motivator for working abroad received 2 (9%) mentions.

(iv) Quality of education and healthcare received 2 (9%) mentions.
(v) Racial intolerance received 1(5%) mention.

4.3.4 Understanding the Work Environment

The fourth objective was to determine strategies that companies can employ to reduce the emigration potential of their engineers. To determine the needs of these employees, a deep dive into various aspects of the employee's work life was done.

Research Objective 4: Propose strategies to reduce emigration of engineering professionals in the South African petroleum refining industry. The research question to meet this objective is:
Research Question 4: What strategies can be employed to reduce the emigration potential of current staff?

In this section, the interviewees were asked questions pertaining to their work environment to have deeper understanding about their feelings on their work environment and unearth the experiences that underpin those feelings. The interview data was divided into 6 below themes, and coded for deeper analysis:

(i) Career & Person Goals Alignment between Employee and Company
(ii) Growth opportunities,
(iii) Interpersonal factors
(iv) Job specific factors
(v) Personal perceptions
(vi) Remuneration and Benefits

Table 4.4: Political, Economic and Social Push-Pull Interview Data

Participant	Political Push and Pull Factors	Economic Push and Pull Factors	Social Push and Pull Factors
Interviewee 1	Change of presidency increased political stability in South Africa.	Increasing Taxes with little visible benefit. Cost of living & Quality of life is good in South Africa	Security and Hijacking concerns. Public service isn't a contributor
Interviewee 2	No	No macroeconomic factors. Personal finance driven e.g., to pay off bond in shorter period.	No.
Interviewee 3	No	No	US/Europe closer to family and to do something different
Interviewee 4	Political instability. Hopeful due to change in presidency	Economic inequality. Paying up debt. Financial freedom. Cost of living increasing e.g., high fuel costs.	Increased crime due to poverty. A better life for family
Interviewee 5	No	Personal Finance gain abroad (better benefits)	No
Interviewee 6	N/A	N/A	N/A
Interviewee 7	No	Quality of life better in Denmark.	Racial intolerance
Interviewee 8	Poor governance, poor policy implementation and lack of support to small business. High and no visible benefit.	High inflation results in high cost of living.	Crime – safety concern
Interviewee 9	High levels Corruption.	Weak currency is a push factor. Increasing cost of living (e.g., Gas Price & VAT)	No
Interviewee 10	No	Tax free salary is a pull factor and possibly to retire early. High in Taxes in South Africa.	No.
Interviewee 11	No	No	Better Healthcare & Education opportunities for kids abroad
Interviewee 12	Poor governance & project execution.	Poor Salaries are a push factor. Weak Currency and better salary & benefits abroad.	Better education opportunities for kids abroad

Interviewee 13	Poor governance & lack of strategic vision. High levels of corruption	Better Salary, quality of life abroad. Cost of living is high in SA – you don't see progress (stuck in one place).	No
Interviewee 14	No	Better Salary & quality of life abroad	High crime levels
Interviewee 15	Poor governance and job security in SOE	Higher earning power abroad, better benefits (schooling, car, accommodation) & early retirement	High Crime – Safety specifically for females concerning
Interviewee 16	No	No	No
Interviewee 17	Policies (BEE) No experienced skilled mentors (all white and left or retired)	No	Family and friends are pull factors.
Interviewee 18	Lack of transformation in the workplace	Tax free salary & benefits (education) abroad to alleviate economic burdens.	No
Interviewee 19	No	Weaker Rand (currency)	No
Interviewee 20	N/A	N/A	N/A
Interviewee 21	N/A	N/A	N/A
Interviewee 22	No	Financial freedom (to be debt free e.g., bond)	No
Interviewee 23	No	Better Money, higher disposable income abroad. High taxes in SA, High interest rates,	No
Interviewee 24	Political instability a push factor	Weaker rand.	No
Interviewee 25	No	Exchange Rate (weaker rand) push factor & tax-free salary is a pull factor	No

Source: Author

4.3.4.1 Career & Person Goals Alignment between Employee and Company

Career Goals:

55% (12) of the 22 interviewees in the positive and moderate emigration potential categories, said their career goals could not be achieved while working for their current organisation. The reasons being that some of the interviews feel like they've hit a ceiling, and that their career goals depend on their senior vacating their position. The remaining 10 (45%) of the interviewees said that their career goals can be fully or partially achieved while working for their current employers, because of opportunities that exist outside of their department.

Personal Goals:

When asked about their personal goals, there was a 50-50 split with 50% (11) of the interviewees saying their personal goals can be achieved while working for their current company. This was because they believed that had control over the attainment of their personal goals and therefore an internal locus of control. The remaining 50% (11) said their personal goals cannot be achieved because, achieving their personal goals. For example, paying of the house bond, financial comfort, early retirement etc. depended on them getting a higher salary which they believed was difficult to attain.

4.3.4.2 Growth Opportunities and Advancement

This theme encompassed various growth-related factors like on the job training, classroom training and job progression. This topic drew strong feelings from the 22 interviewees with Positive and Moderate EP.

On-the-job learning/training:

This theme had 68% (15) positive mentions, with the remaining 32% (7) being indifferent. It is worth noting that not a single negative mention was made about on the job training meaning that employees are satisfied with the exposure, learning and growth that comes from their day-to-day work.

Classroom training:

This theme received 45% (10) positive mentions and 45% (10) negative mentions. The remaining 10% (2) were indifferent about it the amount of formal classroom training they were currently receiving.

Career Advancement:

Adequacy of employee progression received 73% (16) negative mentions and only 9% (2) positive mentions. It was not a factor for the remaining 18% (4) interviewees who were indifferent about their career advancement. This is a strong indication that employees feel that they have little chance of progression while working for their current roles within their current departments. Some of the reasons interviewees gave for their negative outlook about their career advancement opportunities were:

- Organisations have a flat organigram, organisation structure, where managers and leaders had to vacate their positions for subordinates to progress.
- Some organisations did not have technical specialist career paths to complement the traditional management career paths, and where they existed, the specialist career paths were not effectively utilized.

4.3.4.3 Interpersonal Factors

This theme focused on employee-manager relations, support received from manager and perceived fairness in the workplace of the positive and moderate EP interviewees. The relationship with manager received 68% (15) positive responses, and 32% (7) negative responses.

Employee-Manager Relationship

Analysis of the 7 negative interview responses showed a strong link between poor employee support from the manager and bad employee-manager working relations because 86% (6) of the 7 negative responses said they received no support from their immediate line manager, with only 14% (1) saying they received the desired support from the manager.

Analysis of the 15 positive interview responses showed that 60% (9) had a good relationship with the manager due to support they received.

Employee-Colleagues Relationship

The Relationship with colleagues was not a factor for 13 (59%) of the interviewees, with 7 (32%) having good relations and 2 (9%) having bad relations due to colleagues not delivering out promised work, as the roles were interdependent.

Perceived Manager Fairness

Perceived manager fairness received 45% (10) negative responses due to perceived bias and favouritisms. This negatively affects the employee-manager working relationship because, 60% of the interviewees (6 of the 10) who believed their manager showed employee favouritism had a bad relationship with their manager. This finding highlights the detrimental effects of perceived unfairness in the workplace.

A perceived fair manager received 36% (8) of the responses, with all 8 (100%) interviewees having a good relationship with their manager i.e., the manager showed no employee favouritism. This finding highlights the positive impact of perceived fairness in the workplace.

The remaining 18% (4) of the interviewees were neutral about it their manager favouritism at work.

4.3.4.4 Job Specific Factors

When the interviewees were asked about how they feel about their job, they listed a variety of factors from work-life balance to the work being routine. The positive and negative job specific factor feedback received from the interviewees is summarised below:

Positives Job Specific Factors:

(i) A good work-life balance, 22% (5)
(ii) Challenging and Interesting work, 62% (14)
(iii) Sufficient time to complete assigned tasks received, 17% (3). 2 of the 3 interviewees who had sufficient time to complete their work said it was due their work not being integrated with that of other employees, giving them greater control and ensuring agreed deadlines are met.

Negatives Job Specific Factors:

(i) Work-life balance received 27% (6) negative mentions. The main contributor to poor work-life balance was work eating into family time, due to employees having to complete work at home after hours.
(i) Work-related stress received 10% (2) mentions, with long working hours and the inability to switch the mind off from work (still thinking about work) when at home being the main contributor.
(ii) Work overload received 13% (3) mentions with the drivers being the integrated nature of the work and due to a lack of resources resulting in having to do other employees' work to make progress on their own.
(iii) Dynamic work targets (moving targets) received 8% (2) mentions. Some of the interviewees highlighting the importance of constant work prioritization as an essential requirement to keep abreast with the moving targets.
(iv) Insufficient time to complete work and meet the agreed deliverables received 10% (2) mentions,
(v) Insufficient or limited resources to complete work assigned received 17% (4) mentions, 6 being due to integrated work resulting in a competition for shared resources and the remaining 3 being due to a lack of manpower as companies often struggle to find suitable replacements after resignations, or companies deciding to not replace lost resources.

(vi) Poor job challenge received 10% (2) negative mentions due to the work being monotonous, repetitive in nature.

(vii) Internal work-related politics received 5% (1) negative mentions as a factor that affects the workplace.

4.3.4.5 Personal Perceptions - Recognition and Appreciation

When asked about the recognition and appreciation they received for quality work, 45% (10) of the interviewees gave positive feedback and 55% (12) gave negative feedback. The positive feedback was due to verbal recognition and the existence of a rewards program, like certificates and awards for good performance or special appreciation. Then negative mentions were due to dissatisfaction around favouritism in the giving of recognition and rewards. An observation was that some of the interviewees linked how much they were valued to value to both their yearend performance review ranking, and the reward programs received throughout the year.

4.3.4.6 Remuneration & Benefits

Views on Salary

When the 22 interviewees who considered emigration were asked whether they were happy with their current remuneration/salary and benefits, 59% (13) said they were happy and 41% (9) said they were unhappy with their current salary.

View on Benefits

When asked about their benefits, 41% (9) positive mentions were received, and 59% (13) negative mentions were received. The driving reason for the negative mentions, was because the benefits offered little value as they were not aligned to the needs of the employees. When the 13 interviewees who were unhappy with the current employee benefits were asked to recommend more appropriate benefits that would be of value to them, they responded as follows:

(i) Flexitime (option to work from home once a week): 38% (5) mentions.

(ii) Petrol allowance (1 full tank) a month: 31% (4) mentions.

(iii) Standardisation of Benefits across organisation: 31% (4) mentions.

Performance Management

The 22 interviewees were asked to express their view and opinion around the performance review processes, the bonus structure as well as the individual key performance indicators (KPIs). It was determined that 64% (14) unhappy about the bonus and KPIs, 27% (6) were happy about it and the remaining 9% (2) felt indifferent about it. A deeper analysis of the 14 unhappy interviewees revealed the 2 major themes:

- 64% (9), said that the KPIs that are linked to bonus pay-out were not achievable due to complicated formulas used for calculating the bonus lacking transparency.

- 36% (5) said the bonus pay-out distribution between manager and front-line workers unequitable, due to the subjectivity and favouritism within the performance review process used to calculate employee yearend bonuses.

4.3.5 Retention

The fifth objective was to propose hiring strategies that can be used to reduce the emigration potential.

Research Objective 5: Propose hiring strategies that can be used to ensure a higher retention rate of future staff. The research question to meet this objective is:

Research Question 5: What hiring strategies can be used to ensure a higher retention rate/lower emigration potential of future staff?

Retention was dealt with during the interviews to extract any underlying reasons for the expressed views or beliefs about the expressed desire to emigrate. A summary of the main themes and sub themes that surfaced under different topics of the retention discussion with the 22 interviewees who considered emigrating is below:

Referrals

(i) 59% (13) of the 22 interviewees said they would refer someone to work in their company because the job is challenging and interesting.

(ii) The remaining 41% (9) said they would not refer someone to work in their current company due to a bad work environment, for example, not being valued, employees having unresolved grievances and, a lack of career progression.

Job Satisfaction:

(i) Meaningful and challenging roles that resulted in technical growth emerged strongly with employees who enjoyed their role, with 63% (14) of the interviewees saying this was the most important factor.

(ii) The employees with poor job satisfaction didn't have a dominant emerging theme but a combination of themes which are discussed below:

- Monotonous work: Employees felt bored after being in the same role for a while. They desired personal involvement in planned job rotation strategies to explore different roles which would allow them to learn new skills, whilst applying their experienced. Unilaterally decided or forced job rotation left employees disgruntled and actively looking for alternative employment.
- No clear career path: The dissatisfaction was due to the absence and/or poor use of existing career progression paths.

- Not valued: Employees felt their feeling and grievances were ignored, and thus not valued by the organisation.

Deal Breakers

The deal breakers are the items that make the engineers so unhappy that it they would be pushed into looking for alternative employment.

(i) Bias and favouritism by manager in the forms of cliques, which often run along racial lines, was the strongest theme with 27% (6) of the responses. Companies should be aware of the damaging consequences of preferential treatment and favouritism.

(ii) Minor deal breaker themes that came forth were:

- Not being valued, 14% (3) of the interviewee responses.
- Lack of Career Path & Progression 14% (3) of the interview responses.
- Poor Salary, 14% (3) of the interviewee responses.
- Force positional moves, 9% (2) of the interviewee responses.
- Lack of integrity in technical decision making, and being forced to make or endorse such decisions, 9% (2) of the interviewee responses.
- Poor relationship with line manager caused by a series of traumatic events and or lack of support with 4% (1) response each.
- No deal breakers existed 9% (2).

Work Culture:

When asked to describe their work culture at their respective companies, the emerging themes were:

(i) Blame culture, Politics, Mistrust 32% (7).
(ii) High performance, teamwork, productive 23% (5)
(iii) Strong Safety, integrity 18% (4) & Collaborative culture: 2 (9%)
(iv) Top down Authoritative, no accountability, Favouritism 18% (4)

4.4 Chapter Summary:

Chapter 4, using qualitative interviews, aimed to determine the emigration potential of refining engineers, and the drivers for their desired emigration to develop suitable and effective strategies to reduce their emigration potential. The study findings from the interviews revealed an extremely high emigration potential among the engineers with 56% of the engineers actively applying for jobs overseas, mostly to the Middle East. The engineers with the highest Emigration Potential were 31-36 years of age with their main drivers for emigration being a combination of an unhappy work environment and rapidly decline macro-economic environment which is reducing their disposable income due to high inflation. Even though inflation was a concern, 59% of the interviewed engineers were happy with their current salaries. However, the number of 59% of the engineers we dissatisfied with their company benefits because they offered little practical value to their day-to-day lives.

This chapter 4 also highlighted the concerning degree to which the lack of clear career progression and progression path negatively affected the engineers with 73% saying that were unhappy with it. Another thorn in the flesh for the engineers was their perceived manager bias and favouritism in the workplace experienced through performance appraisal system which led to unhappiness in the workplace. As a result, 64% of the engineers expressed disappointment and unhappiness about the performance appraisal process because they believe it lacks accuracy and reliability. In terms of job satisfaction, meaningful and challenging roles that resulted in technical growth emerged strongly with employees who enjoyed their role, with 63% (14) of the interviewees saying this was the most important factor and were happy with their jobs. The following chapter, 5, will analyze the data from the quantitative survey questionnaires and will discuss the findings to answer the research questions and objectives of this study.

CHAPTER 5: QUANTITATIVE DATA PRESENTATION

5.1 Introduction

The previous chapter 4 examined and analysed the qualitative data set obtained from the interviews by thematic analysis, and descriptive analysis. The emigration potential was determined, as was the demographic characteristics of the engineers with the positive emigration potential. The analysis in chapter 4 also expounded on the critical factors that propelled emigration both in the work place and in day-to-day life outside of work.

This chapter. 5, presents the quantitative survey data and results, from the mixed method approach i.e., results from the questionnaire received from the respondents. In total, 87 competed survey questionnaire responses were analysed using “R” statistical software to measure central tendency and dispersion i.e., obtaining means and standard deviations to analyse and describe the quantitative data from the questionnaire, Analysis of Variance (ANOVA) and t-tests were used to compare the negative, moderate, and positive EP push and pull factors. Microsoft Excel was used to create the tables, bar, and pie charts to graphically help understand and describe the respondent’s immigration potential, demographics, and the critical factors that influence emigration for participants with a positive and moderate emigration potential. The data analysis approach for the survey questionnaire has similarities to that used by Direko and Davhana-Maselesele (2017).

5.2 Descriptive Statistics

Descriptive statistics were conducted on the collected questionnaire data and presented as a combination of bar graphs and pie charts.

5.3. Emigration Potential for Working Abroad: Interview Responses

The first objective of this study was to determine emigration potential:

Objective 1: Determine the emigration potential of current engineering professionals in the South African petrochemical industry. The research question to achieve this objective was:

Question 1: What is the current emigration potential amongst engineering professionals in the South African Petroleum sector?

5.3.1 Emigration Potential for Working Abroad: Survey Responses

Emigration Potential Matrix

Question 01 in the survey goal was to determine the extent of interest or thought respondents had about working abroad. Table 5.1 shows the results that 87% (76 of 87 respondents) had given extensive though to emigration. The complete breakdown was as follows: 60% (52) of the respondents strongly agreed and 27% (24) slightly agreed. The remaining 11 respondents slightly disagreed, 5.75% (5), strongly disagreed and 1% (1) or were undecided, 5.75% (5).

Table 5.1: Survey responses to question A1 on thought about working abroad.

Item	Statement	Strongly Disagree	Slightly Disagree	Undecided	Slightly Agree	Strongly Agree
A01	I have given extensive though to the possibility of working abroad	1 (1.14%)	5 (5.74%)	5 (5.74%)	24 (27.58%)	52 (59.77%)

Source: Author

To ascertain the extent to who respondent with a positive EP have planned and taken active steps towards emigration, the planning and connectivity factors were built into the survey questionnaire from questions A2 to A11, shown in Table 5.2.

The questions in Table 5.2 were divided into the “planning/intention” and “connectivity” factors where:

- Planning represents the intention to emigrate – questions A2 to A6 (5 items)

- Connectivity represents the active steps taken to make the plan to emigrate a reality – questions A8, A10, and A11 (3 items

Questions A7 and A9 were not included because the underlying feelings/views they would capture are already adequately captured by the items under the Planning and Connectivity Factors. The planning factor had a scale range of 5-25, as it is consisting of 5 items. The connectivity factor had a scale range of 3-15, due to it consisting of 3 items. Table 5.2 shows results from the 87 participants for the Planning and Connectivity Factors.

Table 5.2: Responses to questions A2-A11 about intention and connectivity

Item	Factor	Statement	Strongly disagree	Slightly disagree	Undecided	Slightly agree	Strongly agree
A2	Planning	I have a strong desire to work abroad	4 (4.60%)	13 (14.94%)	10 (11.49%)	17 (19.54%)	43 (49.43%)
A3		I am planning to abroad within the next two years	15 (17.24%)	8 (9.19%)	22 (25.29%)	20 (22.99%)	22 (25.29%)
A4		I am planning to work abroad within the next five years	11 (14.10%)	3 (3.45%)	16 (18.39%)	22 (25.29%)	35 (40.23%)
A5		I am researching living conditions (abroad)	16 (18.39%)	11 (14.10%)	8 (9.19%)	26 (29.89%)	26 (29.89%)
A6		I am searching for employment opportunities abroad on the internet	16 (18.39%)	7 (8.05%)	3 (3.45%)	31 (35.63%)	30 (34.48%)
A8	**Connectivity**	I have friends/social links working abroad	6 (6.90%)	3 (3.45%)	2 (2.30%)	21 (24.14%)	55 (63.22%)
A10		I have obtained information about potential	5 (5.75%)	7 (8.05%)	4 (4.60%)	30 (34.48%)	41 (47.13%)

		employment abroad					
A11		I have been contacted by a recruitment agency about potential employment abroad	14 (16.09%)	4 (4.60%)	5 (5.75%)	20 (22.99%)	44 (50.57%)

Source: Author

Note: (i) Connectivity: Mean = 12.30, SD = 2.97 (ii) Planning/intention: Mean = 18.01, SD = 6.11

To determine the means and standard deviations of the planning and connectivity factors, the Likert scale responses were coded with 1, 2, 3, 4, 5 representing strongly disagree, slightly disagree, undecided, slightly agree and strongly agree respectively. The mean and standard deviations in Figure 5.1 were calculated from the survey responses in Table 5.2, which showed that Planning/intention Factor has Mean = 18.01, with a Standard Deviation (SD) = 6.1, while the Connectivity Factor has a Mean = 12.30 with a Standard Deviation (SD) = 2.97.

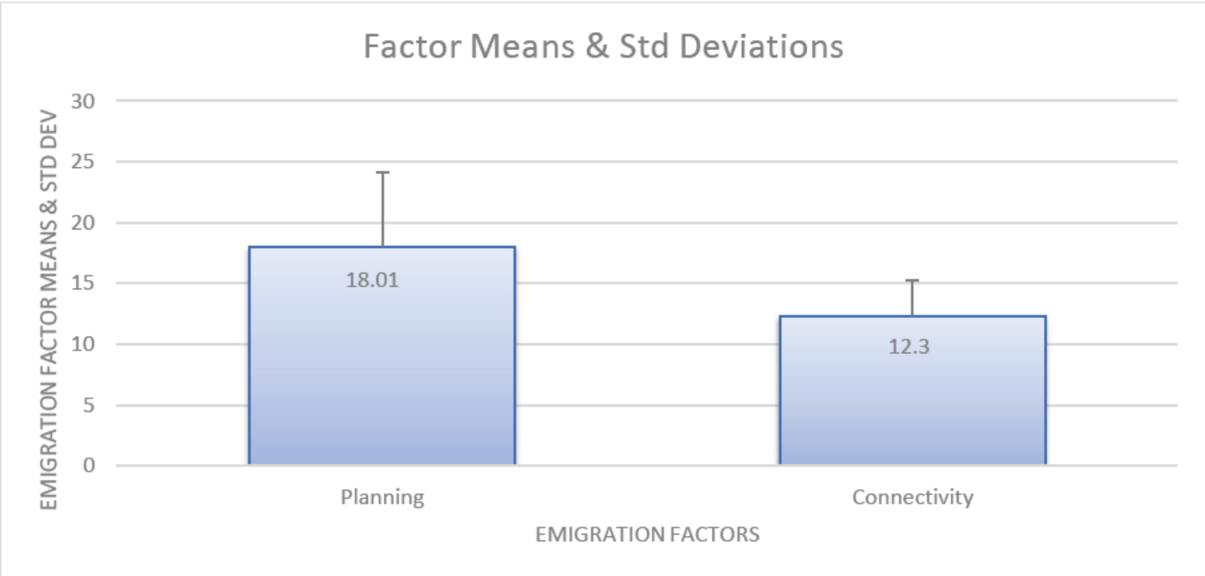


Figure 5.1: Survey Questionnaire Planning and Connectivity Factor Means and Standard Deviations

To determine the EP of the respondents, the product of their planning and connectivity factors scores was used to calculate an EP score and develop the 3 by 5 emigration potential matrix, shown in Figure 5.2. The horizontal, X-axis, of the emigration potential matrix represents the Intention/planning factor. This Intention/planning axis has 5 blocks with a scale interval of 25, resulting in scale range of 25 to 125. The vertical axis, Y-axis, represents the connectivity factor. This connectivity axis has 3 blocks with a scale interval of 25, resulting in a scale range of 25 to 75. The matrix enabled the classification the EP scores which could be graphically plotted on this 5 by 3 EP matrix. A criterion was developed to divide the EP scores from the respondents in into different EP categories, and subcategories that could be plotted on the EP Matrix.

The EP categories and subcategories are summarized in Table 5.3. Using the subcategories EP score ranges in Table 5.3, the emigration potential matrix in Figure 5.2 was colour coded where the colours: Green, Blue, Yellow, Brown, and Red represented the Very Low, Low, Medium, High, and Very High emigration potential subcategories respectively.

The Emigration Potential of the survey respondents shown in Table 5.3 show that 52% (45) of the respondents had a Positive Emigration Potential, with 25% (22) having in the Moderate Emigration Potential Category and the remaining 20 (23%) having a Negative Emigration Potential. The respondents in the high and very high subcategories accounted for ~52% of the respondents, indicating urgent intervention is required to reverse the trend.

	75 (VL)	**150 (L)**	**225 (H)**	**300 (H)**	**375 (VH)**
Connectivity	**50 (VL)**	**100 (L)**	**150 (L)**	**200 (M)**	**250 (H)**
	25 (VL)	**50 (VL)**	**75 (VL)**	**100 (L)**	**125 (L)**
	Intention				

Figure 5.2: Emigration Potential Matrix with Emigration Potential Scores (Source: Author)

Table 5.3: EP Categories and Subcategories Score Ranges and Results

Emigration Potential Category	Emigration Potential Subcategory	EP Score Range	Emigration Potential per Subcategory	Emigration Potential per Subcategory
Negative EP	Very Low EP	1-75	23%	11.49 %
	Low EP	76-150		11.49 %
Moderate EP	Moderate EP	151-224	25%	25.28 %
Positive EP	High EP	225-300	52%	24.14 %
	Very High EP	301-375		27.59 %
Total			**100%**	**100%**

Source: Author

5.3.2 Nature of Emigration

5.3.2.1 Desired host country or region

Table 5.4 shows the desired host regions of the survey respondents. The highest number of respondents, 35 (40%), indicated their desired host country to be in the Middle East Region. The second highest host region of choice was Europe with 25 (29%) of the responses, followed by North America and Australasia with 13 (15%) and 6 (7%) respectively. The remaining regions i.e., Asia, Africa, Southeast Asia and Other jointly accounted for only 8 (9%) of the total responses.

Table 5.4: Survey desired host region if they emigrate.

Category	Subcategory	Middle East	Europe	North America	Australasia	Asia & Southeast Asia	Balance
+ EP	Very High EP	15	2	3	2	2	0
	High EP	9	8	1	1	2	0
Moderate EP	Moderate EP	5	10	5	1	0	1
- EP	Low EP	3	3	3	0	0	1
	Very Low EP	3	2	1	2	0	2
Total		**35**	**25**	**13**	**6**	**4**	**4**

Source: Author

Graphical analysis of the desired host region for the survey participants with a positive emigration potential from Table 5.4 is shown in the bar and pie chart in Figure 5.3a and 5.3b respectively. The data showed the Middle East Region to be ranked as the most desired host region with more than half, 53% (24), of the responses. Europe ranked second with 22% (10) of the responses, followed by North America with 9% (4) of the responses. The remaining regions of Australasia, Southeast Asia and Asia had 7% (3), 7% (3) and 2% (1) responses respectively with Africa and Other regions recording no responses from this EP positive group.

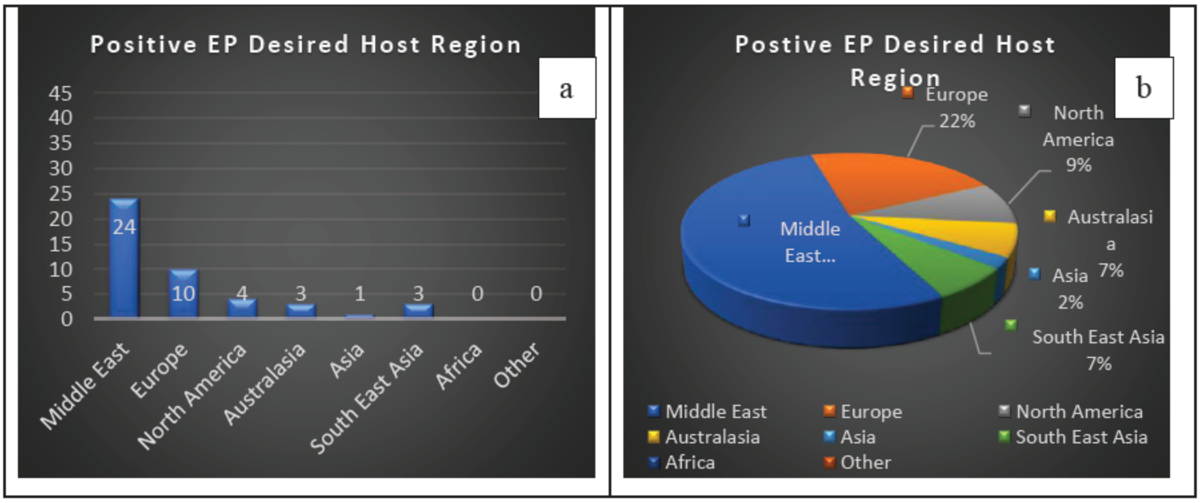


Figure 5.3: (a) Bar Chart and (b) Pie Chart for Positive EP Survey Respondents

5.3.2.2 Duration of stay in host country

The data in Table 5.5 shows the number of years that the survey respondents would like to remain in their desired host region if they emigrate. Analysis of all the respondent's data showed 3-4 years to be the most desired emigration duration with 25 (29%) of the responses. This was closely followed by the 5-6 years duration with 18 (21%) of the responses. The third and fourth highest emigration durations were permanently and 1-2 years with 14 (16%) and 11 (13%) respectively. The respondents who were undecided about their emigration duration were 9 (10%), and those with an emigration duration of less than 1-year (< 1 year) recorded zero responses.

The analysis of emigration duration of the positive emigration potential respondents is shown in the pie chart in Figure 5.4. This data showed the 3-4 years emigration duration to have the highest number of responses, 13 (29%). The second and third highest durations were permanently and 5-6 years with 10 (22%) and 9 (20%) responses respectively. The 3-6 years emigration duration therefore account for 22 (49%) of the positive emigration potential respondents, which is approximately half the of the positive emigration group.

Table 5.5: Desired Emigration Duration of Survey Respondents

EP Category	**EP Subcategory**	**Number of Years**					**Perm**	**Undecided**	**Other**
		1-2	3- 4	5- 6	7- 8	9- 10			
+ EP	Very High EP	1	6	5	1	3	6	2	0
	High EP	3	7	4	0	2	4	1	0
Moderate EP	Moderate EP	2	8	5	0	1	2	4	0
- EP	Low EP	4	2	3	0	0	1	0	0
	Very Low EP	1	2	1	0	1	1	2	2
Total		**11**	**25**	**18**	**1**	**7**	**14**	**9**	**2**

Source: Author

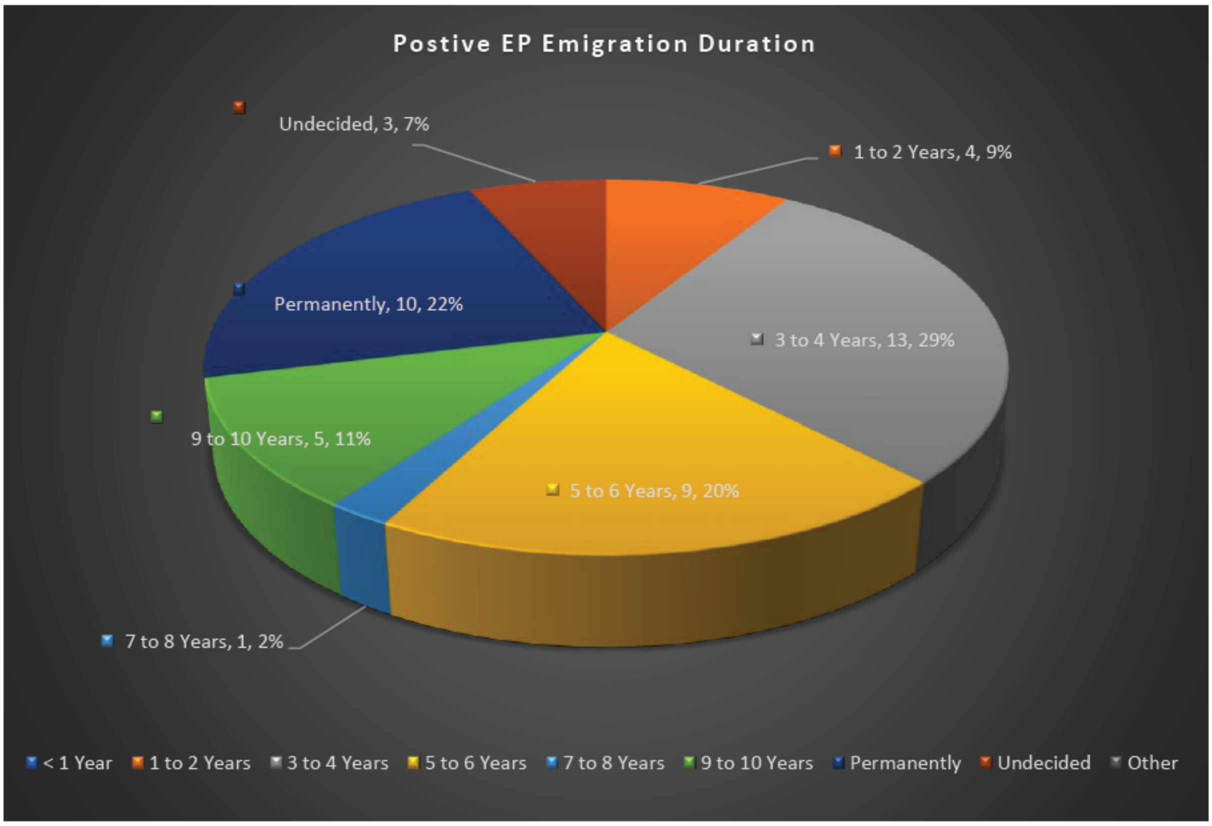


Figure 5.4: Desired Emigration Duration of Positive EP Respondents

5.4 Micro-Economic Financial Factors

5.4.1 Desired Salary Increase for Emigration (Micro-Economic Factors)

The survey participants were asked what percentage increase in their current gross salaries they were willing to emigrate for and responses shown in Table 5.6. The predominant salary increase percentage was a 15-25% increase, with a total of 25% (22 of 87) of the responses. This was closely followed by a 55% salary increase with 22% (19 of 22) of the respondents and a 95% salary increase with 20% (17 of 87) of the total responses.

Table 5.6 shows that the acceptable salary to emigrate is 15-25% for a quarter of the respondents with a very high positive EP, 25% (6 of 24), while the 29% (6 of 61) of the respondents with a high EP found a 55% salary increase to be acceptable to emigrate.

Table 5.6: Desired salary increase of the survey respondents to emigrate

EP Category	EP Subcategory	Desired salary increases to emigrate.								Sub -Cat Tot.
		15-25%	35%	45%	55%	65%	75%	85%	95%	
+ EP	Very High EP	6	2	2	4	0	5	0	3	**24**
	High EP	4	2	2	6	1	1	0	5	**21**
Moderate EP	Moderate EP	6	2	1	4	1	2	2	4	**22**
- EP	Low EP	1	1	0	4	0	1	0	3	**10**
	Very Low EP	2	1	1	1	1	1	1	2	**10**
Total		**22**	**8**	**6**	**19**	**3**	**10**	**3**	**17**	
Total in %		**25%**	**9%**	**7%**	**22%**	**3%**	**11%**	**3%**	**20%**	

Source: Author

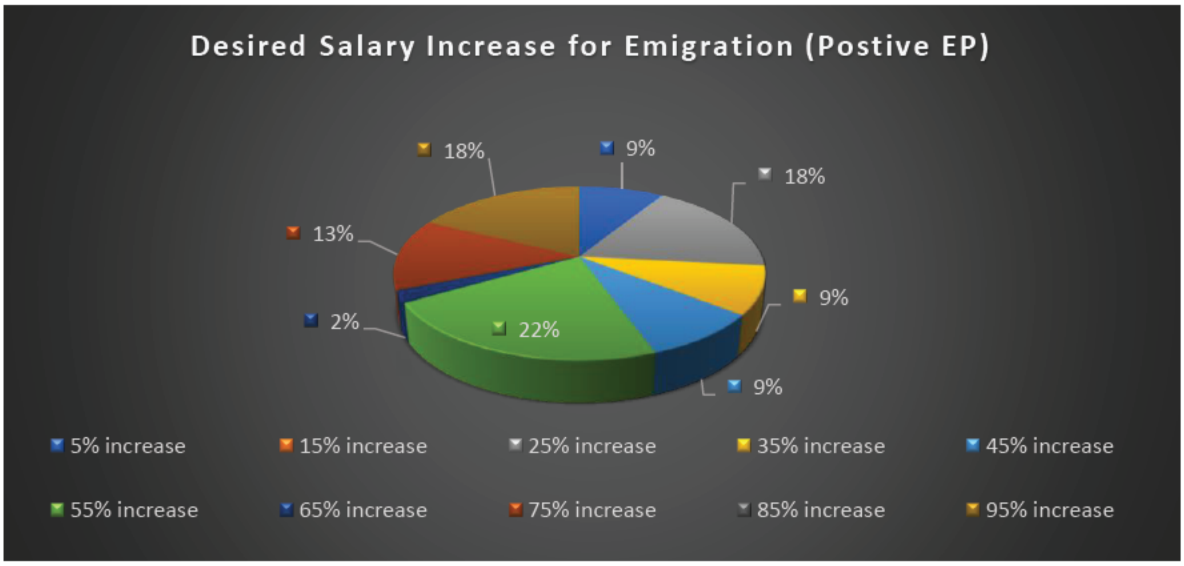


Figure 5.5: Desired Salary Increase for Emigration of Survey Respondents

5.4.2 Salary v/s Job Challenge

When presented with the following statement “At present a higher salary is more important than job challenge.”, the 87 respondents’ responses are shown in Table 5.7. The data in the Tables 5.7 and Figure 5.6 show that 61% (53) of the respondents felt that job challenge was more important than a higher salary, with the 39% (34) of the remaining respondents felt a higher salary was more important than job challenge.

Table 5.7: A higher salary v/s job satisfaction

EP Category	EP Subcategory	False	True
Positive EP	Very High EP	14	10
	High EP	14	7
Moderate EP	Moderate EP	15	7
Negative EP	Low EP	7	3
	Very Low EP	3	7
Total		**53**	**34**

Source: Author

Figure 5.6: Higher salary v/s job satisfaction

Deeper analysis of the data in Table 5.7 above, by the emigration subcategories, revealed the following:

Very high Emigration Potential Subcategory, n=24: 58% (14) of the respondents said job challenge was more important than a higher salary. The remaining 42% (10) said a higher salary was more important than job challenge.

High EP Subcategory, n=21: 67% (14) said that at present, job challenge was more important than a higher salary. The remaining 33% (7) said a higher salary was more important than job challenge at present.

Moderate EP subcategory, n= 22: 68% (15) said a job challenge was more important than a higher salary at present. The remaining 32% (7) said a higher salary was more important than job challenge.

Low EP subcategory, n=10: 70% (7) said job challenge was more important than a higher salary. The remaining 30% (3) said a higher salary was more important than job challenge.

Very low EP subcategory, n=10: 30% (3) said a higher salary was more important than job challenge. The remaining 70% (7) said a higher salary was more important than job challenge.

5.5 Demographical Profile: Survey Responses

The demographic variables covered by the survey questionnaire includes age, gender, ethnic group, marital status, home language, engineering discipline, and highest qualification i.e., education level.

5.5.1 Gender

Analysis of the overall data in Table 5.8 shows that 63 (72%) of the 87 respondents were male, and 24 (28%) of the respondents were female. Table 5.8 showed that 38 (60%) of the 63 males had a positive EP, with the majority falling in the "very high" EP subcategory, 22 (35%). The data for females showed the highest EP category was the moderate EP with 38% (9) with 29% (7) having a positive emigration potential and 33% (8) having a negative emigration potential. This indicates that more female engineering professionals are starting to consider emigration as an option. This finding is consistent with research by Dumont, Martin, Spielvogel (2007) indicating that female migration to Economic Cooperation and Development (OECD) countries has been increasing significantly in recent decades; this includes highly skilled and educated females. The Ipsos MRBI (2016) survey found that 72% of women who emigrated from Ireland had a Bachelors, Master or PhD degree as compared to 59% of male respondents.

Table 5.8: Gender Distribution of Survey Respondents by EP Subcategory

Source: Author

Demographic Variables	**Negative Emigration Potential Respondents**		**Moderate Emigration Potential**	**Positive Emigration Potential Respondents**	
	Very low EMP	Low EMP	Moderate EMP	High EMP	Very high EMP
Gender (*n* = 87)	**(*n* = 10)**	**(*n* = 10)**	**(*n* = 22)**	**(*n* = 21)**	**(*n* = 24)**
Male (63 respondents)	5 (50.00%)	7 (70.00%)	13 (59.09%)	16 (76.19%)	22 (91.67%)
Female (24 respondents)	5 (50.00%)	3 (30.00%)	9 (40.91%)	5 (23.81%)	2 (8.33%)

5.5.2 Age

The overall data in Table 5.9 shows that 37 (43%) of the 87 respondents were between 31-35 years of age. The second highest respondent ages group was 26-30 with 19 (22%) of the respondents.

Table 5.9: Age Distribution of Survey Respondents EP by Subcategory

Demographic Variables	Negative Emigration Potential Respondents		Moderate Emigration Potential	Positive Emigration Potential Respondents	
	Very low EP	Low EP	Moderate EP	High EP	Very high EP

Age (n = 87)	(n = 10)	(n = 10)	(n = 22)	(n = 21)	(n = 24)
21-25	0 (0.00%)	0 (0.00%)	2 (9.09%)	0 (0.00%)	0 (0.00%)
26-30	1 (10.00%)	1 (10.00%)	6 (27.27%)	9 (42.86%)	2 (8.33%)
31-35	5 (50.00%)	5 (50.00%)	7 (31.82%)	7 (33.33%)	13 (54.17%)
36-40	3 (30.00%)	1 (10.00%)	3 (13.64%)	3 (14.29%)	6 (25.00%)
41-45	0 (0.00%)	0 (0.00%)	3 (13.64%)	2 (9.52%)	2 (8.33%)
46-50	0 (0.00%)	2 (20.00%)	1 (4.55%)	0 (0.00%)	1 (4.17%)
51-55	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
56-60	0 (0.00%)	1 (10.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
61-65	1 (10.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Source: Author

Detailed analysis of the very high and high EP Subcategories from Table 5.9 showed the following:

- **Very High EP, n=24:** The highest number of respondents, 13 (54%) were between the age of 31 and 35 with the 36 to 40 age group having the second highest number of respondents, 6 (25%).
- **High EP, n=21:** The highest number of respondents, 9 (42%) were between the age of 26 and 30, with the 31 to 35 age group having the second highest number of respondents, 7 (33%).

The overall age data in the chart in Figure 5.7 showed that the peak age for emigration is between 31 to 35 years. The bar chart also showed that the desire to emigration initiates between the ages of 26 to 30 years and starts to drop after 36 years of age.

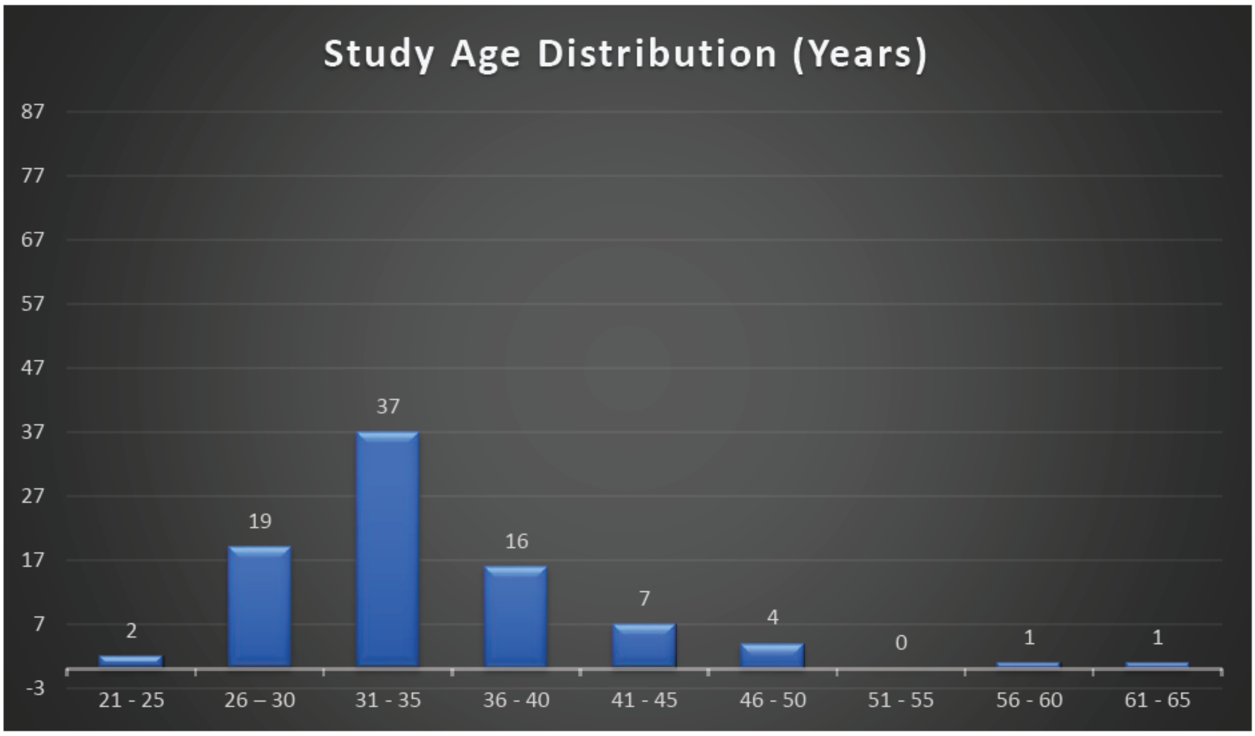


Figure 5.7: Age Group Distribution of Survey Respondents

5.5.3 Ethnic Group

The African ethnic group accounted for most of the 87 survey participants with 47 (54%) responses follow by White 18% (16 of 87) and Indian with 17% (15 of 87) of the survey participants. Analysis of the ethnic groups of the respondents with very high and high and moderate EP subcategories in Table 5.10, the following is observed:

Very High Emigration Potential, n=24: The highest number of respondents, 11 (45%) were Native African with the second highest number of respondents, 6 (25%) being White.

High Emigration Potential, n=21: The highest number of respondents, 13 (61%) were Native African, with having the second highest number of respondents, 4 (19%) being White.

Table 5.10: Ethnic Group of the Survey Respondents by EP Subcategory

Demographic Variables	Negative Emigration Potential Respondents		Moderate Emigration Potential	Positive Emigration Potential Respondents	
	Very low EMP	Low EMP	Moderate EMP	High EMP	Very high EMP
Ethnic Group (*n* = 87)	**(*n* = 10)**	**(*n* = 10)**	**(*n* = 22)**	**(*n* = 21)**	**(*n* = 24)**
Black	6(60.00%)	6(60.00%)	11(50.00%)	13(61.90%)	11(45.83%)
White	2(20.00%)	0 (0.00%)	4(18.18%)	4 (19.05%)	6 (25.00%)
Coloured	0 (0.00%)	1(10.00%)	3 (13.64%)	0 (0.00%)	2 (8.33%)
Indian	2(20.00%)	3(30.00%)	4 (18.18%)	3 (14.29%)	3 (12.50%)
Asian	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (4.76%)	2 (8.33%)
Mixed (Biracial)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Other	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Source: Author

5.5.4 Marital Status

The material status data in Table 5.11 showed that 55 (63%) of the respondents were married, followed by 28 (32%) single respondents who've never been married. The divorced and separated respondents were 3 (4%) and 1 (1%) respectively. Analysis of the groups of the respondents with very high and high and moderate emigration potential subcategories in Table 5.11, the following is observed:

- Very High Emigration Potential, n=24: The highest number of respondents, 16 (66%) were married with the second highest number of respondents, 8 (33%) being single.

- High Emigration Potential, n=21: The highest number of respondents, 13 (62%) were married, with the second highest number of respondents, 6 (28%) being single.

Tale 5.11: Marital Status of the Survey Respondents EP Subcategory

Demographic Variables	Negative Emigration Potential Respondents		Moderate Emigration Potential	Positive Emigration Potential Respondents	
	Very low EMP	Low EMP	Moderate EMP	High EMP	Very high EMP
Marital status (*n* = 87)	**(*n* = 10)**	**(*n* = 10)**	**(*n* = 22)**	**(*n* = 21)**	**(*n* = 24)**
Married	7(70.00%)	8(80.00%)	11(50.00%)	13(61.90%)	16(66.67%)
Widowed	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Divorced	0 (0.00%)	0 (0.00%)	1 (4.55%)	2 (9.52%)	0 (0.00%)
Separated	1(10.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Single/never married	2(20.00%)	2(20.00%)	10(45.55%)	6(28.57%)	8(33.33%)

Source: Author

5.5.5 Level of Experience

The data in Table 5.12 showed that most of the respondents had between 5-10 years of experience, 42 (48%), followed by 18 (21%) respondents with 11-16 years of work experience. The key observation from Table 4.13 is that the in the Positive EP group, 22 (49%) of the 45 respondents in this group had 5-10 years of working experience. Respondents with 11-16 years of experience had 11 (29%) responses. Analysis of the very high and high EP subcategories showed the following:

Very High Emigration Potential, n=24: The 5-10 years and 11-16 years of working experience had equal responses of 10 (41%) respondents each.

High Emigration Potential, n=21: The highest number of respondents, 12 (57%) had 5-10 years of working experience.

Table 5.12: Level of Experience of the Survey Respondents by EP Subcategory

Demographic Variables	Negative Emigration Potential Respondents		Moderate Emigration Potential	Positive Emigration Potential Respondents	
	Very low EMP	Low EMP	Moderate EMP	High EMP	Very high EMP
Level of Experience (*n* = 87)	**(*n* = 10)**	**(*n* = 10)**	**(*n* = 22)**	**(*n* = 21)**	**(*n* = 24)**
0-1	0 (0.00%)	0 (0.00%)	0 (9.09%)	0 (0.00%)	0 (0.00%)
1-2	0 (10.00%)	1 (10.00%)	1 (4.54%)	2 (9.52%)	0 (0.00%)
3-4	0 (50.00%)	5 (50.00%)	3 (13.63%)	3 (14.28%)	1 (4.16%)
5-10	8 (80.00%)	2 (20.00%)	10(45.45%)	12(57.14%)	10(41.67%)
11-16	0 (0.00%)	0 (0.00%)	5 (22.72%)	3 (14.28%)	10(41.67%)
16-20	1 (10.00%)	0 (0.00%)	3 (13.63%)	1 (4.76%)	3 (12.50%)
>20	1 (10.00%)	2 (20.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Source: Author

5.5.6 Highest Qualification

The highest qualification data showed that 55, (53%) of the respondents had a bachelor's degree, followed by 20 (23%) with Honours Degrees and 21 (24%) with master's degrees. None of the respondents had a Doctoral degree.

The very high and high EP subcategories in Table 5.13, showed the following:

Very High Emigration Potential, n=24: The highest number of respondents, 14 (58%) had bachelor's degrees with the second and third highest number of respondents, 7 (29%) and 3 (12%) having Honours degrees and master's degrees respectively.

High Emigration Potential, n=21: The highest number of respondents, 10 (47%) had bachelor's degrees with the second and third highest number of respondents, 4 (19%) and 7 (33%) having Honours degrees and master's degrees respectively.

Table 5.13: Highest Qualification of the Survey Respondents by EP Subcategory

Demographic Variables	**Negative Emigration Potential Respondents**		**Moderate Emigration Potential**	**Positive Emigration Potential Respondents**	
	Very low EMP	Low EMP	Moderate EMP	High EMP	Very high EMP
Highest qualification (*n* = 87)	**(*n* = 10)**	**(*n* = 10)**	**(*n* = 22)**	**(*n* = 21)**	**(*n* = 24)**
Bachelors	8(80.00%)	6(60.00%)	8(36.36%)	10(47.62%)	14(58.33%)
Honours	1(10.00%)	2(20.00%)	6(27.27%)	4 (19.05%)	7 (29.17%)
Masters	1(10.00%)	2(20.00%)	8(36.36%)	7 (33.33%)	3 (12.50%)
Doctorate	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Source: Author

5.6. Pull and Push Factors: Survey Responses

The pull and push factor from the survey responses underwent ANOVA and t-Tests.

5.6.1 Push-Pull Analysis of Variance (ANOVA) Test results

The Likert scale responses for the survey questions pertaining to push-push factors were coded for responses 1, 2, 3, 4, 5 to represent strongly disagree, slightly disagree, undecided, slightly agree, and strongly agree respectively. After coding, statistical analysis was done with the results presented in Table 5.14, which shows the three means, standard deviations of the political, social, and economic push and pull factors for the respondents with a positive, moderate, and negative EP. Evaluation of the means in Table 5.14 showed that all the means ranged between 2.81 and 3.75. This table also shows the analysis of variance tests (ANOVA) F-tests results of the same three EP groups, where the resultant p-values showed them all to be greater than the significance level of 0.05 (5%). The F-test result therefore confirm that the differences in the means are not statistically significant. Since the surveys were never intended to make statistical generalization, but to better understand the data and how the different emigration potential groups responded to the pull and push factor related questions, methods to increase the power, for example, increasing sample size, a higher significance level or using a one-sided hypothesis were not explored.

Table 5.14: ANOVA F-test results for negative, moderate, and positive EP Groups

Variable	Negative EP (*n* = 20)		Moderate EP (*n* = 22)		Positive EP (*n* = 45)		*F*-test
	M	*SD*	*M*	*SD*	*M*	*SD*	
Push political	3.14	.93	3.32	.98	3.49	1.13	F (2,84) = .83, p = .440
Push economic	2.81	.95	2.91	.86	3.11	1.16	F (2,84) = .66, p = .520
Push social	3.45	1.03	3.43	1.04	3.48	1.04	F (2,84) = .02, p = .983
Pull political	3.15	1.05	3.27	.77	3.51	1.02	F (2,84) = 1.01, p = .337
Pull economic	3.55	1.21	3.82	.63	3.75	.95	F (2,84) = .46, p = .632
Pull social	3.69	1.24	3.79	.79	3.63	1.06	F (2,84) = .18, p = .833

Source Author

5.6.2 Push-Pull t-Test Results

Focus on the two main groups as intensified by conducting a T-test to compare the means of the two emigration potential groups i.e., those with a positive EP and those with a negative EP, with results shown in Table 5.15. The results in Table 5.15 shows the p-values for the political, social, and economic factors of both EP groups to be greater than the 0.05 (5%) significance level, confirming that the differences in the means are not statistically significant. The t-test results in Table 5.15 are therefore consistent or similar with the F-test results in Table 5.14.

Table 5.15: t-test results for positive EP and negative EP survey respondents

Variable	Negative EP (n = 20)		Positive EP (n = 45)		t-test
	M	SD	M	SD	
Push political	3.14	.93	3.49	1.13	t (63) = -1.24, p = .221
Push economic	2.81	.95	3.11	1.16	t (63) = -1.01, p = .316
Push social	3.45	1.03	3.48	1.04	t (63) = -.09, p = .927
Pull political	3.15	1.05	3.51	1.02	t (63) = -1.31, p = .196
Pull economic	3.55	1.21	3.75	.95	t (63) = -.72, p = .475
Pull social	3.69	1.24	3.63	1.06	t (63) = .21, p = .833

Source: Author

5.7. Work Environment:

The fourth objective was to determine strategies that companies can employ to reduce emigration potential of their engineers. To determine the needs of these employees, a deep dive into various aspects of work life was done.

Objective 4: Propose strategies to reduce emigration of engineering professionals in the South African petroleum refining industry. The research question to meet this objective is:
Question 4: What strategies can be employed to reduce the emigration potential of current staff?

In this section, the survey respondents were all asked about their work environment. Table 5.16 summarises the work environment survey results by showing the means and standard deviations for the negative, moderate, and positive EP groups. Survey data was divided into 4 below themes, and coded for deeper analysis:

(i) Growth opportunities
(ii) Interpersonal factors
(iii) Job specific factors
(iv) Personal perceptions.

Table 5.16: The mean and standard deviations of survey respondents for the EP Group

Item	Variable	Negative EP (*n* = 20)		Moderate EP (*n* = 22)		Positive EP (*n* = 45)	
		M	*SD*	*M*	*SD*	*M*	*SD*
1	My organisation's work-place safety is great	3.65	1.35	4.05	1.17	4.24	.98
2	My organisation has great promotion opportunities	2.45	1.15	2.55	1.41	2.62	1.32
3	I receive training and growth in areas that interest me	2.55	1.28	3.09	1.31	3.20	1.44
4	I am happy with the organisational leadership	2.42	1.17	2.86	1.28	2.87	1.31
5	I don't experience work-related stress	2.21	1.44	2.05	1.00	2.47	1.31
6	I am fairly paid for my qualifications and experience	3.35	1.31	2.91	1.27	2.96	1.36
7	I find my job interesting and challenging	4.00	.86	3.68	1.04	3.78	1.18
8	My organisation affords me the opportunity to gain international experience	1.50	1.10	2.14	1.32	2.44	1.55
9	My work is appreciated	3.20	1.24	3.05	.97	3.36	1.48
10	I am rewarded for the high quality of my work	3.20	1.15	2.68	1.17	2.91	1.38
11	I feel that my work colleagues are competent	4.25	.91	3.77	1.07	3.80	1.15
12	I have good inter-personal relationships with my colleagues	4.60	.50	4.14	.77	4.27	.97
13	My direct line manager/supervisor shows no favouritism	3.45	1.36	3.55	1.41	3.47	1.42
14	I've been in the same position too long	3.74	1.45	3.09	1.41	2.87	1.52
15	The skills acquired in my current role are transferable to other roles within the organisation that might interest me	3.95	1.19	3.86	1.04	4.31	.85
16	My work is important and contributes to society	4.40	1.10	4.00	.98	3.93	1.23
17	I can achieve my personal goals while working at my current company	3.50	1.23	3.05	1.00	3.11	1.32
18	I can achieve my career goals while working at my current company	3.35	1.31	2.77	1.10	2.87	1.35
19	My organisation is well known and respected in society	4.10	1.33	4.18	1.14	4.36	1.07

Source: Author

5.7.1 Growth Opportunities and Advancement

The Likert scale questions 2,3,8,14 and 18 from Table 5.17 were grouped into the growth opportunities factor theme and analysed, with the results of this analysis shown in Table 5.17. The data In Table 5.17 shows that growth opportunity's theme had a mean of means of 2.8, which was the lowest of the 5 Themes. For this theme, the questions with the lowest Modes and Medians of 1 and 2 respectively, pertained to career progression and opportunities to gain international experience. This indicates that respondents have a very negative outlook about the current progression opportunities. The answer with the highest Median and Mode of 4, dealt with the topic of training and development, which indicates that the respondents were happy with the amount and relevance of training that companies provide, even if the training did not directly translate to opportunities to gain international experience.

Table 5.17: Growth opportunity key area for the positive EP survey respondents

No	Key Area	Variable	Mean	SD	Median	Mode	Themes Mean of Means
2	**Growth Opportunities**	My organisation has great promotion opportunities	2.62	1.32	2	1	2.8
3	**Growth Opportunities**	I receive training and growth in areas that interest me	3.2	1.44	4	4	
8	**Growth Opportunities**	My organisation affords me the opportunity to gain international experience	2.44	1.55	2	1	
14	**Growth Opportunities**	I've been in the same position too long	2.87	1.52	2	2	
18	**Growth Opportunities**	I can achieve my career goals while working at my current company	2.87	1.35	3	3	

Source: Author

5.7.2 Interpersonal Factors

This area of focus was about on employee-manager relations, support received from manager and perceived fairness in the workplace. The survey questionnaire Likert scale questions 4,13 and 13 in Table 5.18 comprised the interpersonal factor theme. The results of this analysis showed the mean of means of 3.53 indicating that many of the respondents felt positive about their work relationships with both colleagues and senior leadership. The questions No. 12 and 13 that deal specifically with relation with the colleagues and favouritism had means 4.27 and 3.47 respectively, with Medians and Modes of 4 and higher indicating positive work relationships.

Table 5.18: Interpersonal key area for the positive EP survey respondents

No	Key Area	Variable	Mean	SD	Median	Mode	Theme Mean of Means
4	**Interpersonal**	I am happy with the organisational leadership	2.87	1.31	3	4	3.53
12	**Interpersonal**	I have good inter-personal relationships with my colleagues	4.27	0.97	4.5	5	
13	**Interpersonal**	My direct line manager/supervisor shows no favouritism	3.47	1.42	4	5	

Source: Author

5.7.3 Job Specific Factors

The Likert scale questions 5,7,9,10 and 11 were grouped into the job-related factor theme, with the results shown in Table 5.19. This theme had a mean of means of 3.46, which showed that the respondents generally had a positive outlook about the job-related factors. The two questions with the lowest means of 2.47 and 2.91 related to experiencing job related stress and a lack of appreciation for high quality respectively.

Table 5.19: Job specific key area for the positive EP survey respondents

No	Key Area	Variable	Mean	SD	Median	Mode	Theme Mean of Means
5	**Job Specific**	I don't experience work-related stress	2.47	1.31	2	2	3.46
7	**Job Specific**	I find my job interesting and challenging	3.78	1.18	4	4	
9	**Job Specific**	My work is appreciated	3.36	1.48	4	4	
10	**Job Specific**	I am rewarded for the high quality of my work	2.91	1.38	3	4	
11	**Job Specific**	I feel that my work colleagues are competent	3.8	1.15	4	4	

Source: Author

5.7.4 Personal Perceptions about Employer

When asked about their perception on their employer, respondents answered as per the Likert scale questions 1,15,16,17 and 19 in Table 5.20, which were grouped into the personal perceptions factor theme and analysed after coding. Personal perceptions about the employer organisation had a mean of means of 3.99, which was the highest of the five work environment factors. The Likert questions with the highest Median and Mode, of 5 each, pertained to the good reputation of the respondent's employers.

Table 5.20: Personal perception key area for the positive EP survey respondents

No	Key Area	Variable	Mean	SD	Median	Mode	Mean of Means
1	**Personal Perceptions**	My organisation's work-place safety is great	4.24	0.98	4	5	3.99
15	**Personal Perceptions**	The skills acquired in my current role are transferable to other roles within the organisation that might interest me	4.31	0.85	4	5	
16	**Personal Perceptions**	My work is important and contributes to society	3.93	1.23	4	4	
17	**Personal Perceptions**	I can achieve my personal goals while working at my current company	3.11	1.32	3	4	
19	**Personal Perceptions**	My organisation is well known and respected in society	4.36	1.07	5	5	

Source: Author

5.7.5 Remuneration & Benefits

The Likert scale question 6 dealing with the remuneration factor is shown in Table 5.21. The responses from the respondents were generally neutral i.e., neither happy nor unhappy.

Table 5.21: Remuneration key area for the positive EP respondents

No	Key Area	Variable	Mean	SD	Median	Mode	Key Area Mean of Means
6	**Remuneration**	I am fairly paid for my qualifications and experience	2.96	1.36	3	4	2.96

Source: Author

5.8 Chapter Summary

Like the previous Chapter 4, this Chapter 5, analysed the quantitative survey results to determine the emigration potential of refining engineers, and to identify the main drivers for their desired emigration to develop suitable and effective strategies to reduce their emigration potential. To quantify the emigration potential, the responses from the survey questionnaires were processed, analysed, and assigned an emigration potential score using a product of their individual planning and connectivity scores. The EP score could be measured against the migration potential matrix developed by the researcher in Figure 5.2. The emigration potential analysis revealed that 52% of the engineers had a positive emigration potential, meaning that more than half of the surveyed engineers were actively applying for jobs overseas, with Middle East as their most preferred location, as indicated by 40% of the engineers. Using their emigration potential scores, the engineers with a positive emigration potential were further be broken down into a “high” and “very high” EP subcategories which had 24% and 28% of the engineers respectively. The demographics of the engineers showed the dominating age range within the very high emigration potential subcategory were between 31-35 years of age and dominating age range within with high emigration potential subcategory to be 26-30 years. The level of work experience for the EP positive group (high and very high EP respondents combined) was 5-10 years’ work experience. A notable observation is that most of respondents in the very high EP subcategory, said a 15-25% salary increase was a sufficient trigger to emigrate, which is not a substantial increase for unearthing one’s life and moving to a new country.

The ANOVA F-test and T-test results for the pull and push factors for the EP various EP groups analysed confirmed that the differences in the means are not statistically significant. In terms of the work environment, the positive findings were that the working relationship between the engineers and their colleagues and managers was shown to be good. The negative revelations from the survey questionnaire was that the engineers had a negative outlook about their career advancement, while the analysis of the job specific factors showed that they experienced overstress and a lack of appreciation and recognition.

The following chapter, 6, will now converge and integrate the qualitative and quantitative results, from chapters 4 and 5 respectively, and discuss the findings to answer the research questions and objectives of this study.

CHAPTER 6: INTERELATION AND COMPARISON OF DATA SETS

6.1 Introduction

This chapter, 6, correlates and compares the data from the previous chapters 4 and 5 which are qualitative data analysis and quantitative data analysis respectively. The purpose of this chapter is to interrelate and compare the results obtained from the two different collection and analysis methods, to obtain a more comprehensive analysis of the study results. As mentioned in chapter 3, overlaying the qualitative and quantitative data sets on top of each other will yield more credible results as the strengths of one analysis method will cover the weaknesses of the other. This chapters compares the data in a structured manner covering three areas which are: (1) Emigration potential of the engineers, (2) Demographic characteristics of the engineers, and (3) Emigration drivers. The Emigration potential and demographic sections of the two data sets were compare and descriptively, after the qualitative data was for these two areas was transformed into quantitative data. The section on emigration drivers results from the two data sets were compared using a combination of descriptive statistics and thematic analysis.

6.2 Results Comparison

6.2.1 Emigration Potential

Quantitative Data Set Results

The Emigration Potential of the survey respondents that 52% (45 of 87) of the respondents had a Positive Emigration Potential, with 25% (22 of 87) having in the Moderate Emigration Potential Category and the remaining 23% (20 of 87) having a Negative Emigration Potential. The desired host regions of the survey respondents the Middle East with 40% (35 of 87) of the responses, followed by Europe with 29% (25 of 87) of the responses.

Qualitative Data Set Results - Transformed Qualitative Data

The results from the interviewee responses showed that that 56% (14 of 25) of the interviewed engineers had a Positive EP and therefore currently applying for jobs abroad. From the remaining engineers, 32% (8 of 25) had a Moderate EP and 12% (3 of 25) had a negative EP. Focus was put on the 22 engineers with a positive EP and Moderate EP to determine their desired host regions in the event of emigration. The results showed the top two desired host regions to be the Middle East with 41% (9 of 22), follow by Europe with 36% (8 of 22).

Author interrelation and Comparison of the Two Data Sets

The Two data sets showed identical results in that more than 50% of the engineers had a Positive EP, and their preferred regions for emigration were the Middle East and Europe as first and second choice respectively.

6.2.2 Demographic Characteristics

6.2.2.1 Gender

Quantitative Data Set Results

Analysis of the overall data shows that 72% (63 of 87) respondents were male, and 28% (24 of 87) of the respondents were female. Closer analysis of the males showed that 60% (38 the 63) of the males had a positive EP, with the majority falling in the "very high" EP subcategory, 35% (22 of 63). The analysis of the 24 female engineers showed the highest EP category to the moderate EP with 38% (9 of 24), follow by the positive EP with 29% (7 of 24) of the responses and the low EP with 33% (8 of 24) of the responses.

Qualitative Data Set Results - Transformed Qualitative Data

The gender distribution of the 25 interviewees was 88% (22 of 25) male and 12% (3 of 25) female. The positive EP group which had 14 individuals was almost entirely comprised of males with 93% (13 of the 14), and only 7% (1 of 14) being female. The moderate emigration potential group had 8 individuals, also comprised mostly of males 75% (6 of the 8) with females accounting for 25% (2 of the 8). The negative EP group comprised of 3 interviewees had 100% males (3 of 3) and zero females.

Author interrelation and Comparison of the Two Data Sets

Analysis of the gender of both the data sets showed good correlation with the emigration to be male dominated, which was expected as the engineering profession is traditionally male dominated. While having a lower EP compared to their male counterparts, both data sets showed women to be increasingly considering emigration. The increasing mobility of women is goes against the traditional believe that women have a negative emigration mobility due to their traditional roles as wives and mothers. This finding is consistent with research by Dumont, Martin, Spielvogel (2007) indicating that female migration to Economic Cooperation and Development (OECD) countries has been increasing significantly in recent decades; this includes highly skilled and educated females.

6.2.2.2 Age

Quantitative Data Set Results

The overall analysis of the age data of the 45 positive EP respondents showed that the peak age for emigration is between 31 to 35 years, with 44% (20 of 45) of the respondents. The 26 – 30 years age range had the second highest number of respondents in this positive EP group, with 24% (11 of 45). The 36 – 40-year-old age range had the third highest number of respondents with 20% (9 of 45) of the responses.

Qualitative Data Set Results - Transformed Qualitative Data

Analysis of the positive EP group of 14 individual showed that 50% (7 of 14) of the individuals were between the ages 31-35, with the second highest age range of 25-30 years accounting for 29% (4 of 14) of the individuals in this group. The data showed that the EP experienced a noticeable drop after age 36, with the 36-40 years age range having 14% (2 of 14) of the responses and the 41-45 years age range having only 7% (1 of 14).

Author interrelation and Comparison of the Two Data Sets

The results showed good correlation between the two data sets with the 30–35-year-old having the highest positive EP. Both data sets showed correlating trends with the desire to emigrate to starting from the 25-30 age range, peaking at 31 – 35 age range and dropping from the age range of 36-40 years.

6.2.2.3 Race and Ethnicity

Quantitative Data Set Results

The African race group accounted for most of the 87 survey participants with 54% (47 of 87) of the responses, followed by White race with 18% (16 of 87) and Indian with 17% (15 of 87) making up the three highest races from the survey respondents. Deeper analysis of the 45 engineers in the positive EP group showed the largest race to be African with 53% (24 of 45), with the second highest race being White, accounting for 22% (10 of 45) of the positive EP engineers.

Qualitative Data Set Results - Transformed Qualitative Data

The distribution of the 25 interviewees by ethnic group shows that that 80% (20 of 25) of the interviewees were of the African race, 8% (2 of 25) were White, 8% (2 of 25) were Indian and 4% (1 of 25) was Coloured. Analysis of the positive EP showed that 86% (12 of 14) of this group were African, with the remaining 14% (2 of 14) being White.

Author interrelation and Comparison of the Two Data Sets

The results from the two data sets for the EP positive group showed good correlation with the native African and White races being placed first and second respectively. It is important to note that this is likely due to African and White races being the two most represented races in both data sets.

6.2.2.4 Marital Status

Quantitative Data Set Results

The marital status data showed that 63% (55 of 87) of the respondents were married, followed by 32% (28 of 87) single respondents who've never been married. The divorced and separated respondents were 4% (3 of 87) and 1% (1 of 87) respectively. Analysis of the 45 engineers in the positive EP group revealed that the highest number of engineers, 64% (29 of 45), were married, with the single engineers placed second highest accounting for 31% (14 of 45) of the positive EP group.

Qualitative Data Set Results - Transformed Qualitative Data

The marital status analysis of the 25 interviewed engineers showed 48% (12 of 25) to be single, which was closely followed by those married accounting for 44% (11 of 25). Analysis of the 14 engineers in the positive EP group showed the single engineers to be dominant with 64% (9 of 14) of the group, with the married engineers being the second largest with 29% (4 of 14).

Author interrelation and Comparison of the Two Data Sets

The marital status results of the positive EP group from the two data sets were contradictory. The quantitative data set results showed that 64% of the engineers with a positive EP in the were married, while qualitative data set showed an equal number of 64% of the engineers with a positive in the were single. No clear conclusion could be made on the impact of marital status on emigration potential.

6.2.2.5 Level of Experience

Quantitative Data Set Results

The survey questionnaire data showed that 48% (42 of 87) of the respondents had between 5-10 years of experience, followed by those with 11-16 years of work experience accounting for 21% (18 of 87). When zooming into the top two work experience levels for the 45 positive EP engineers, the results showed that 49% (22 of 45) of the respondents in this group had 5-10 years of working experience, with 11-16 years of experience accounting for 29% (11 of 45) of the responses.

Quantitative Data Set Results - Transformed Qualitative Data

Analysis of the 14 positive EP interviewed engineers showed the two work experience levels with the highest peaks to be the 11-15 years' work experience with 50% (7 of 14) interviewees, closely followed by the 5-10 years' working experience level with 43% (6 of 14) of the interviewees.

Authors interrelation and Comparison of the Two Data Sets

For the quantitative data set, the 5-10 years' experience level were the outright majority, while for the qualitative data the 5-10 years and 11-15 years' experience levels showed similar, or comparable results. The results from the two data sets showed an acceptable level of correlation where the dominating experience level ranged from 5-15 years working experience.

6.2.2.6 Highest Qualification

The highest qualification was only covered in the survey questionnaire, and therefore only discussed in the quantitative data set, and not in the qualitative data set.

Quantitative Data Set Results - Transformed Qualitative Data

The highest qualification form the survey results was a bachelor's degree with 53% (55 of 87) of the respondents, followed by 23% (20 of 87) with an honours degree and the remaining 24% (21 of 87) with a master's degree. No conclusive patterns between qualification and emigration potential could be established from the study results.

6.2.3 Emigration Drivers

6.2.3.1 Neoclassical Economic Theory

Quantitative Data Set Results

Analysis of the full data set show the predominant salary increase percentage to be 15-25%, with a total of 25% (22 of 87) of the responses. This was closely followed by a 55% salary increase with 22% (19 of 22) of the respondents and a 95% salary increase with 20% (17 of 87) of the total responses. A deeper analysis of the acceptable salary to emigrate for respondents in the very high EP and high EP subcategories showed the following:

- Very high EP: A quarter, 25% (6 of 24) found a salary increase of 5-25% to be acceptable to emigrate.
- High EP: A quarter, 29% (6 of 21) found a salary increase of 55% to be acceptable to emigrate.

A notable observation is that most of respondents in the very high EP subcategory, said a 15-25% salary increase was a sufficient trigger to emigrate, which is not a substantial increase for unearthing one's life and moving to a new country. An important finding was that 61% (53 of 87) of the respondents felt that job challenge was more important than a higher salary, with the remaining 39% (34 of 87) saying a higher salary was more important than job challenge.

Quantitative Data Set Results - Transformed Qualitative Data

The results from this data set showed that 59% (13 of 22) of the engineers were happy with their current salaries, with the remaining 41% (9 of 22) being dissatisfied with their current salaries.

Qualitative Data Set Results - Thematic Analysis

Thematic analysis reveal that while most of the engineers were happy with their current salaries, the currency (ZAR) consistently weakening against the USD and the Euro, was sparking the thought of emigration due to the potential of higher earnings abroad.

Authors interrelation and Comparison of the Two Data Sets

The result looking at the Neoclassical Economic Theory yielded similar results in that a higher salary abroad played a role in the decision to emigrate. It was surprising that the engineers in the very high EP subcategory, said a 15-25% salary increase was a sufficient trigger to emigrate, which is not a substantial increase for unearthing one's life and moving to a new country.

An important finding was that 61% (53 of 87) of the respondents felt that their current job challenge was more important than a higher salary abroad, with the remaining 39% (34 of 87) saying a higher salary was more important than job challenge. This suggests that money isn't the only driver for the emigration of the engineering professionals, because the increase that they are willing to emigrate for is small and can be obtained with changing jobs inside South Africa without having to emigrate.

Link to Theory: Push and Pull Factor Theory due to the weakening and rapidly rising cost of living.

6.2.3.2 Push and Pull

Quantitative Data Set Results

The political, economic, and social push factors results for the positive EP group showed the means to be 3.49, 3.11, 3.48 respectively. While the political, economic, and social pull factors for the same positive EP group showed the means to be 3.51, 3.75, 3.63 respectively. The economic pull factor had the highest mean of 3.75 among the push and pull factors data set, while also having the lowest standard deviation of 0.95.

Analysis of variance tests (ANOVA) F-tests were conducted for the negative, moderate, and positive EP categories. Results for the positive EP category showed resultant p-values greater than the significance level of 0.05 (5%), confirming that the differences in the means are not statistically significant. The T-test conducted to compare the means of the positive EP and negative EP categories showed the p-values for the political, social, and economic factors of both these two EP categories to be greater than the 0.05 (5%) significance level, confirming that the differences in the means were not statistically significant. The t-test results were consistent or similar with the F-test results in Table 5.14.

Qualitative Data Set Results - Transformed Qualitative Data

The analysis of the political, economic, and social push and pull factors for the 22 engineers with a positive EP and moderate EP revealed the following:

- **Political push and pull factors:** Even though 23% (3 of 22) engineers were dissatisfied with political factors like poor governance, political factors didn't play a role in the decision to emigrate with 54% (12 of the 22) interviewed engineers saying it was not a factor in their decision to emigrate.
- **Economic push and pull factors:** The analysis of the economic factors revealed that a weakening currency (ZAR) and resultant higher salaries abroad was the leading factor with 41% (9 of 22) of the engineers' responses. The second placed economic factor was a higher inflation and rapidly rising cost of living which received 23% (5 of 22) of the responses.
- **Social push and pull factors:** Most of the engineers, 55% (12 of 22) said social factors didn't play a role in their decision to emigrate, even though aspects like the South Africa's high levels of violent crime was a concern for 23% (5 of 22) of the engineers.

Qualitative Data Set Results - Thematic Analysis

The thematic analysis of the push and pull factors revealed the deteriorating macroeconomic environment to be an important theme. Also, it was the only constructed theme that was not part of the direct work environment. With regards to theme, the engineers were very worried about the rapidly increasing cost of living i.e., the higher food prices, higher cost of electricity and higher fuel price due caused by rapidly increasing inflation was reducing their disposable income. The second factor that affected the engineer's disposable income was increasing interest rates from the South African Reserve Bank (SARB) which increased the cost of servicing debt, for example, house loans, car loans, and credit cards. They also raised concerns about the high levels of violent crime and poor governance due to corruption and poor service delivery.

Author interrelation and Comparison of the Two Data Sets

The results from the analysis of the two data sets showed good correlation, with both data sets showing the political and social push and pull factors not playing a dominant role in the decision to emigrate. The data sets showed the economic push and pull factors to be the leading factor due to a deteriorating macroeconomic environment resulting in a high inflation and reduced disposable income.

Link to theory: The main or primary theory that link to this theme is the push and pull factor theory.

6.2.3.3 Work Environment and Motivation

The work environment and motivation question of the survey questionnaire was grouped into five areas of focus i.e., (1) Growth and career progression (2) Interpersonal factors (3) Job specific factors (4) Perceptions on recognition and appreciation and (5) Remuneration and benefits.

6.2.3.3(a) Growth and Career Progression

Quantitative Data Set Results

The results showed that this focus area which dealt with growth and career progression had a mean of means of 2.8, which was the lowest of the five focus areas in this work environment and employee motivation section of the survey questionnaire. The three questions pertaining to promotions, gaining international experience and being in the same position for too long recorded the Modes of 1, 1 and 2 respectively, indicating that engineers had a very negative outlook about their current career progression and international exposure opportunities. The question pertaining to their training and development had the highest Median and Mode of 4, which indicated that the respondents were happy with the amount and relevance of training they received from their employers, even if the training did not directly translate to promotions and or opportunities to gain international experience.

Qualitative Data Set Results - Transformed Qualitative Data

The results from the interviews showed that 73% (16 of 22) of the engineers with a positive and moderate EP were dissatisfied about their career progression, which created a very negative outlook about their progression opportunities. With regards to the on the job learning and training they received from their employers, 68% (15 of 22) of the engineers with a positive and moderate EP were happy it, with the remaining 32% (7 0f 22) being indifferent about it.

Qualitative Data Set Results - Thematic Analysis

The thematic analysis results showed the lack of promotions and career progression to be a theme that cause the engineers great dissatisfaction and unhappiness. Two subthemes which underpinned this these were centred around: (1) Unclear and or underutilized career paths and (2) Manager bias and favouritism in the annual performance appraisals process, and during the distribution of recognition awards throughout the year. The TA results also revealed that organisations that that had clear career paths that catered for both managerial and technical career progression had engineers who were more optimistic about their career growth within the organisation.

Author interrelation and Comparison of the Two Data Sets

The results for training and career progression for the two data sets showed good consistency and correlation, in that both data sets showed the engineers to be very dissatisfied about the lack of career progression. The dissatisfaction with the lack of progression was due to the underutilization of existing career paths or absence of specialist career paths and/or flat organisational structure where promotions dependent on vacancies created from resignations or retirement of seniors. The engineers in both data sets were happy with the training they received within their current roles.

Link to Theory: This theme links strongly to the Maslow's Hierarchy Theory because the needs of the engineer's centred around moving to higher level within their careers i.e., a higher level like esteem and self-actualisation on Maslow's hierarchy triangle. This area of focus also has links to the job redesign theory where companies with the flat organisational structure may look at options of horizontal growth instead of vertical growth to counteract feelings of stagnation by being in the same role for longer than 5 years.

6.2.3.3(b) Interpersonal Factors

Quantitative Data Set

The survey questionnaire results for this focus area showed the mean of means of 3.53, which indicated that engineers had a positive about their work relationships with both colleagues and senior leadership. The two questions that deal specifically with relationships with the colleagues and whether them manager showed any favouritism had means 4.27 and 3.47 respectively, with Medians and Modes higher than 4 indicating positive work relationships with both colleagues and managers.

Qualitative Data Set Results - Transformed Qualitative Data

The relationship with manager received 68% (15 of 22) positive views, and 32% (7 of 22) negative views. Deeper analysis of the positive and negative views revealed the level of manager support to be an important determinant of the nature of the employee-manager relationship.

- Healthy employee-manager relationship: 60% (9 of 15) had a good relationship with the manager said it was due to support they received from their manager.

- Poor employee-manager relationship: 86% (6 of 7) of the engineers who had a poor relationship with their manager cited a lack of support as the reason.

In terms of manager fairness, 45% (10 of 22) of the engineers perceived their manager to be bias and show favouritism, while 36% (8 of 22) believed their manager to be fair, with the remaining 18% (4 of 22) being indifferent. The outcomes from the data analysis was that fair managers had good relationships with all (100%) the subordinates while managers who practices favouritism caused poor employee-manager relationships for 60% of the engineers.

Qualitative Data Set Results - Thematic Analysis

The thematic analysis results revealed engineers generally had good relationships with their managers, which was primarily due to the good support they received form their manager to resolve any work execution challenges they faced. The data set revealed two areas of discontent which were: (1) Bias and favouritism in performance reviews (2) The lack inclusion and diversity in the workplace.

Author interrelation and Comparison of the Two Data Sets

The result for two data sets on the employee-manager relationship showed positive correlation with both revealing a good employee-manager relations primarily due to support received for work resolving work execution challenges. The data also revealed that the manager inability to be fair and to manage with limit or no bias was a threat to this these current good relations because, engineers had bad relationships with their manager where favouritism and bias were present.

Link to Theory: The theories that pertain to focus area are: (1) Adams equity Theory where the results showed the impact of managing fairly and without bias (2) Lawler's Effort and & Outcome Theory where the lack distributional justice in the performance appraisal and recognition awards program was concern as this can contribute to hygiene factors resulting in demotivation, work dissatisfaction as per Hertzberg's Two Factor Theory.

6.2.3.3(c) Job Specific Factors

Quantitative Data Set

This results from this data set showed this job specific factors focus area to have a mean of means of 3.46. This reflected a positive outlook about the job-related factors like having an interesting job, having competent colleagues and their work being appreciated or acknowledged which had individual means of 3.78, 3.8 and 3.36 respectively, with modes of 4. The item with the highest standard deviations in this focus area was employee appreciation, which had a SD of 1.48 indicating a noticeable variation in the responses. The data also showed the two items with the lowest means of 2.47 and 2.91 related to work stress and a lack of reward for high quality respectively. This indicates that the engineers were stressed and desired a tangible form of appreciation, beyond the verbal expression of appreciation.

Qualitative Data Set Results - Transformed Qualitative Data

The interview data revealed the following to be the main positives and negatives from the job factor focus area. The main positive was interesting and challenging work as 62% (14 of 22) of the engineers enjoyed their work. The negative job factors did not have a single stand factor but 3 closely matched factors which were: (1) poor work-life balance with 27% (6 of 22) responses. (2) Insufficient or limited resources to complete work with 17% (4 of 22) of the engineer responses and (3) Work overload which received 13% (3 of 22) mentions from the engineers.

Qualitative Thematic Analysis Results

The thematic analysis revealed poor work-life balance experienced by the engineers to be one of the four main these constructed. This was attributed to high levels of work-related stress, lack of resources and work overload. To improve their work life balance, the engineers desired to have flexible work hours and the option to work remotely at least once a week to better intergrade their work and private lives. From a managerial perspective, it was important to have managers who has relevant experienced to improve and optimize work planning and set SMART team goals and key performance indicators.

Author interrelation and Comparison of the Two Data Sets.

The qualitative and qualitative data sets showed positive correlation in terms of the job being interesting and challenging which was a standout view in both data sets. Positive correlation was also found for the negative aspects like high levels of stress and high workload which contributed to the poor work-life balance experienced by the engineers.

Links to Theory: The theories that apply are the quality of work life theory and Maslow's hierarchy of needs theory because, the engineers wanted a better quality of life as a priority which was beyond the physiological needs of having a job.

6.2.3.3(d) Personal Perceptions – Employer Reputation

Quantitative Data Set

This aspect was only covered in the survey questionnaire. It is therefore only covered by the quantitative data analysis.

This focus area in the questionnaire covered the perceptions that engineers has about their employer. The results showed a mean of means of 3.99 for questions in section meaning the engineers had a very good perception about the employer and the reputation their organisation had in the community. The items with the highest Median and Mode, of 5 each, pertained to the good reputation of the respondent’s employers. Also, this focus area had the highest mean of means of the five work environment factors showing that irrespective of the work environment, all the engineers felt that were working for reputable companies.

6.2.3.3 (e) Personal Perceptions – Recognition and Appreciation

This aspect was only covered in the qualitative Interviews. It is therefore only covered by the qualitative data analysis.

Qualitative Data Set Results - Transformed Qualitative Data

The results from this data set revealed that 55% (12 0f 22) of the engineer expressed negative views on the recognition and rewards programs due to a lack of distributional justice caused by manager favouritism. The remaining 45% (10 of 22) had positive sentiments, which mainly due to verbal recognition they received even if it didn’t translate to a reward.

Qualitative Data Set Results – Thematic Analysis

The thematic analysis results revealed that the favouritism shown by the manager during the performance appraisal process was a sore point. The engineers felt aggrieved by the perceived unfairness of the performance appraisal process due to the high level of subjectivity within the process. There was strong sentiment among the engineers that their managers utilised the performance appraisal process as a reward or punishment tool to rewarded engineers they favoured with good PA scores and punished engineers they disliked were punished by giving less favourable PA scores.

Link to Theory: The theories that pertain to this theme are Adams equity theory and Lawler’s effort and & outcome theory due to the lack distributional justice in the performance appraisal process. If not resolved this hygiene factor will demotivate the engineers and contribute to work dissatisfaction as per Hertzberg’s two factor theory.

6.2.3.3(f) Remuneration and Benefits

Quantitative Data Set

The survey questionnaire results showed the question about happiness about compensation had a Mean of 2.96, a Median of 3 and a Mode of 4. The Mode of 4 indicates that many of the engineers were generally satisfied, however, those who were dissatisfied were very or highly dissatisfied resulting in a mean of 2.96.

Qualitative Data Set Results – Transformed Qualitative Data

The qualitative data set revealed that most of the engineers, 59% (13 of 22) were unhappy with their current benefits as they offered little practical value because they were not aligned to their needs. They cited valuable benefits to be: (1) Flexitime or remote working (2) Petrol allowance equating to 1 full tank a month to be more appropriate benefits.

With regards to performance management bonus benefit, 64% (14 of 22) of the engineers were unhappy about the bonus due to: (1) The KPIs linked to the bonus pay out were unrealistic and not achievable, as well as the complicated formulas used to calculate the bonus pay out, 64% (9 of 14). (2) The bonus pay-out distribution between employees and managers was not equitable due to the big difference in the bonus pay-out, 36% (5 of 14).

Qualitative Data Set Results - Thematic Analysis

The thematic analysis results revealed the most desired benefits to be flexitime and remote working. These nonmonetary benefits engineers believed would better integrate their work life and their personal lives and lead to good work-life balance through

Link to theory: The main theory that links to this theme is the quality of work life theory.

CHAPTER 7: Discussion of Main Research Findings

7.1 Introduction

The previous chapter 6 interrelated and compared the qualitative and quantitative data sets from chapters 4 and 5 respectively, highlighting similar findings as well as differences in the results. Chapter 7 focused on interpretation of the interrelated compared results from chapter 6 to provide logical discussion on the meaning of the results and the implications thereof. Chapter 7 was structured in a way to best address and answer the 5 research questions of this study in a structured manner.

7.2 Main Research Findings in Relation to Research Questions

7.2.1 Research Question 1: What is the current emigration potential amongst engineering professionals in the South African Petroleum sector?

The study revealed that more than half of the engineers working in the petroleum refining industry had a positive emigration potential i.e., 56 percent of the interviewees and 52 percent of the survey respondents were actively applying for work opportunities abroad and hoped to emigrate within the next two years. This number of engineers looking to emigrate is alarmingly hight because, a further 32 percent of the interviewees and 25 percent of the survey respondents had a moderate emigration potential i.e., they were thinking about emigrating but have not started to apply for jobs yet. This means that less than one quarter of the engineers intend to stay in South Africa i.e., 12 percent of the interviewees and 23 percent of the survey respondents. This is consistent with the trend in Figure 2.4 showing an increase in emigration (Stats SA Community Survey, 2016).

The view that engineers were emigrating for better salaries only was misplaced because, Table 4.8 showed that 61 percent of the interviewed engineers felt that job challenge was more important than a higher salary. This finding challenges the traditional theory that the salary difference between the home country and the destination country alone was the primary motivation for emigration (De Haas - as cited in Lee et al., 2017; Todaro – as cited in Bohlman, 2010). The relatively good refinery engineers' salaries have shielded them from feeling the full impact of South Africa's rising inflation and cost of living (Fourie, 2022, Trading Economics, n.d).

Analysis of positive EP group revealed emigration to the Middle East region to be the most preferred as it's a major oil and gas region, with Europe as the second destination of choice due to the better quality of life and better governance offered in most European countries (Tan, Toan and Tuyet - as cited in Okičić, 2019; Asch, 1994). The study also revealed the desired emigration duration to be between 3-6 years with 45% of the interviewees and 29% of the survey respondents choosing this duration.

The Middle East region's oil and gas sector plans to tender 615 oil and gas projects between 2021 and 2025. Most of these projects, 395, will be downstream projects covering refining of crude oil into gasoline, diesel, and other fuels (83 refinery projects) and petrochemical complexes which produce olefins like ethylene and propylene as well as aromatics like Benzene, Paraxylene and Toluene (312 petrochemical projects). Closer to South Africa, neighbouring country, Mozambique has recently discovered 100 trillion cubic feet offshore gas reserves making it a big new player in the global gas industry with Total Energies' and Mozambique LNG are planning a to start a US$ 20 billion, 2.8- million tons per year (mtpa), project in the North of Mozambique in 2022 (McKenzie and Ghazi Balkiz, 2022; Abiq, 2021). These new projects and the South Africa's deteriorating macroeconomic environment will put further pressure on the South African refining companies to retain their skilled engineers.

7.2.2 Research Question 2: What are the demographic characteristics of the personnel who intend to emigrate?

The first demographic characteristic observed showed the gender of the positive emigration potential group to be mostly male, which can be attributed to the fact that most of the engineers in this study were male. This finding is consistent with statistics from UN DESCA (2019) and the Statistic SA community survey (2016) which showed that male emigration was higher than that of females in South Africa. This is like other unequal, traditional, societies of sub-Saharan Africa where the status of women was lower, as compared to the regions of the world where women enjoy a more gender equal status with men, like in Europe and North America. The gap between male and female emigration will reduce as the South African society transforms into a gender equal society which was supported by data for moderate EP which indicated that more female engineering professionals were thinking about emigrating.

The second finding revealed the age range for participants with the highest positive emigration potential was 31-35 years, with the second highest age range being 25-30 years for both data analysis methods. The study also showed that positive emigration potential started rise from the age 25-30 age range and began to drop from the age 36-40 age range. This finding is consistent with research results by Cao and Han (2019) and Acheampong (2019) which showed that in many societies globally, the young adults are the age group with the highest propensity to migrate due to them being in their productive and reproductive prime, in addition to the age and life-cycle changes that affect most humans. The positive emigration potential age range results of this study are therefore well aligned to the standard main families of multiexponential model migration schedules in Figure 2.5a, developed by Raymer and Rogers (2006), which indicates the migration upslope, peaks, and downslope age patterns caused by life course events between ages of 24 and 39.

The work experience level for engineers with a positive emigration was between to 5-15 years. The study also found emigration potential to be independent of university qualification. The ethnic groups with the highest propensity were African and White as the positive emigration category comprised entirely of these two ethnic groups, with Coloured and Indian ethnic groups having their number of engineers in the moderate emigration potential category.

7.2.3 Research Question 3: What are the critical factors that determine whether the employees will stay or leave?

To answer this research question, the push and pull theory and work motivation theories were explored (Lee, 1966, cited in Hager-Zanker, 2008; Asch, 1994; Ullah and Haque 2020). The findings revealed that macroeconomic and work-related factors were the two main critical drivers that contributed to the decision to emigrate. The macroeconomic drivers raised were due to the rapidly rising inflation, increasing cost of living, rising debt levels, high bank interest rates reducing disposable income, an unstable economy and weakening currency (ZAR). The findings were consistent with those of Okičić (2019) and Driessen (2016) that showed that while higher earnings abroad played a role, micro economic factors like a higher salary were not the primary pull variable for engineers to emigrate as most engineers were happy with their current salaries.

While political factors like corruption, poor governance, and social factors high rate of hijacking, and violent crime in South Africa were a concern for the engineers, the majority indicated that political and social factors were not a factor that drove their decision to emigrate.

The work-related findings showed the lack of career progression, feelings of career stagnation, favouritism in the workplace, and poor work-life balance were critical factors that influenced emigration. The feelings of stagnation emanated from prolonged periods in the same role, while the lack of career advancement was due to a flat organisational organogram. The flat organogram meant managers and leaders had to vacate their positions for subordinates to me promoted, due to absence and/or underutilisation of technical specialist career paths to facilitate career progression. Furthermore, the engineers said they experienced high levels of stress and a poor work-life balance they frequently took work home to complete it due to unplanned emergencies and troubleshooting caused by refinery upsets, and line managers setting unrealistic deadlines to complete work. Another factor was that due to the nature of the work being highly integrated with that of other colleagues, which at times resulted in engineers having to do their colleague’s part in order complete their assigned tasks and meet their obligations. The good employee training was the one of the biggest areas of employee satisfaction.

Strained employee-manager relationships due to manager favouritism and bias during the performance appraisals, which impacts company bonus pay-outs, also emerged as a critical factor (Inuwa 2015). The engineers felt that the performance appraisal system was inaccurate, unfair, and unreliable and had effectively become a tool used to reward the employees that managers favoured. This perception of the PA process has led to demotivation and dissatisfaction among the engineers. This finding is consistent with the findings by Banerjee and Krishnam (2018), Lira et al., (2016) and Perry (1995) which revealed that unfairness in the performance appraisal process had a deleterious effect on employee motivation. In addition, the consequence of this PA process unhappiness is a high attrition rate which increases the emigration potential of the engineers. While the intentions of the performance management review process is to reward deserving employees and increase their motivation, commitment and productivity, it rarely achieved this intended purpose because, historically, the effectiveness of the PA process was measured only by its accuracy and reducing rater bias and not on how the employee felt about the performance appraisal outcome i.e., do they feel the evaluation process was fair, do they accept the appraisal result, and whether they are willing to work on the identified areas of improvement in the forthcoming work cycle (Van Dijk and Schodl, 2015). The findings from Lira et al., (2016) were aligned to those of Van Dijk and Schodl (2015) which showed employee motivation and the desire to improve job performance relied heavily on the employee having the below perceptions about the performance appraisal process:

- That the appraisal process was accurate.
- That the appraisal process was free from manager bias.
- That the appraisal process is reliable.
- That the appraisal process was fair.
- That it allowed for expression of their views.

It is essential for the South African companies close the loop and incorporate a mechanism for employees to give feedback on the performance appraisal process after appraisals are concluded.

7.2.4 Research Question 4: What strategies can be employed to reduce the emigration potential of current staff?

As the Gen Z and millennial generations continue to grow into a larger component of the workforce, companies will increasingly struggle with high attrition rates due to the high mobility and job hopping of these generations (Fuscaldo, 2023). The study has unmasked the underlying variables within the workplace and macroeconomic environment causing the high emigration potential, which has given sufficient insight to develop strategies to reduce the emigration potential. The proposed strategies are below:

Career Progression: Organisations must have clear job progression routes for both management and technical specialist roles and use them to promote engineers who are eligible for promotion. Job rotation and job enlargement strategies must be incorporated into the career progression plan to counter feelings of stagnation and improve job satisfaction.

Work Environment: Organisations should improve employee engagement by conducting short surveys and interviews on a range of topics to understand their employees’ needs and grievances. When the employee needs are known, companies should address them as swiftly as possible to ensure the employees feel valued by the organisations which will, in turn, transform the work environment into a pleasant and enjoyable atmosphere. To improve work planning and prevent unnecessary stress, organisations must hire or appoint line managers with sufficient experience in their respective fields, who will understand the time and effort required for successful execution of the tasks and to set realistic timelines and targets.

Flexible Work Hours and Remote Working: Organisations should review company benefits to ensure they are still relevant to the changing needs life circumstances. For example, COVID-19 has increased the ability for companies to include flexible work hours, and remote work and from home as a company benefit. The refining industry engineers from the interviews expressed the desire for this benefit, with 38% of the engineers who were unhappy with their company benefits mentioning the lack of work flexibility as the reason. This finding is consistent with the cross-sector study conducted by CIPD (2019) which revealed that 87% of the participants across all ages and gender wanted more work flexibility. The organisations must explore this benefit to establish how best to implement it across job levels and roles, while maintaining distributive justice.

Fairness: Organisations should work to strengthen distributional justice in the workplace. The robustness of the performance appraisal process needs to be improved by reducing or remove favouritism, bias, and subjectivity through adequate management training on diversity, inclusion, and bias. Key performance indicators on performance contracts should be measurable or quantifiable to reduce subjectivity during the appraisals. Organisations should have a functional recognition and rewards performance management program, that is free from favouritisms and bias, to reward hard working, committed and deserving employees and increase their productivity. This performance management program should have the known success ingredients i.e., be unexpected, be useful, be frequent to make it effective. This finding is consistent with that of the Banerjee and Krishnam (2018) which highlighted the damaging effect that poorly conducted performance appraisals had on employee motivation. The shortcomings of the performance appraisal process listed by Banerjee and Krishnam (2018) were comparable to the issues raised during the interview which were:

The appraisal system used by the organisation was murky and lacked the required transparency. It also could not clearly distinguish between poor, average, and excellent performers making it an ineffective tool to influence the employee's future promotion opportunities within the organisation.

The employees were not engaged on the design of the performance appraisal system to ensure it maintained its relevance. The appraisal system did not have a strong link with the employee's day-to-day work activities causing it to be subjective. This lack of distributional justice resulted in dissatisfied, demotivated, and disillusioned employees because, their hard work yielded no fruit in terms of bonuses and rewards

Employee Assistance: Organisations should utilise their confidential and voluntary employee assistance program effectively. This program should be designed to help employees deal with personal problems that could affect their wellbeing and work performance by offering a range of services like financial and legal advice, crisis response services for cases of death and assault. Consultation services to advise managers and supervisors on improving employee engagement or on referring their subordinates to the EAP program should be made available.

7.2.5 Research Question 5: What hiring strategies can be used to ensure a higher retention rate/lower emigration potential of future staff?

The findings from the research have shown that workforce trends within the refinery engineers are consistent with the current broader workface trends. For example, most of the study participants were millennials, between the ages of 24 and 39 (born between 1981 and 1996). These trends include higher mobility and job hopping, the desire for more flexible working hours and remote working, an increased importance of a happy work environment, and a concept of freelance work and short-term contracts (McConnell, 2022). With the millennials slowly becoming the largest part of the workface, it is important for refining companies to keep abreast of these changes in the workforce to remain competitive.

Prioritize internal recruitment of candidates before external recruitment is considered. This will reduce hiring and onboarding costs, and ensure the positions are filled by candidates who understand the company culture. It will also contribute the career progression and succession planning as well as the job redesign strategy which will reduce emigration driven by lack of career growth and feelings of stagnation.

Maximize use of available technology to increase possibility to find the most suitable candidates. Artificial intelligence can be used for curriculum vitae (CV) screening against a set minimum criterion for skills, qualification, and experience. Interviews can be conducted remotely video through video calling software packages like Microsoft Team, Skype or Zoom. Video interviews would allow for a bigger pool of candidates to select from (Smedley, 2020).

Reduce hiring gender bias that prefers male engineers by hiring more female engineers. The general bias has been because women are perceived to be less reliable due life’s circumstances like caring for sick children, monthly menstrual cycle, and family leave. With the onset of remote working, these life circumstances can now be better managed. The findings showed that female engineers had a lower emigration potential than their male colleagues because, the South African society is still in the process of transitioning from a traditional society into a gender equal society.

7.3 Research Findings Based on Research Objectives

7.3.1 Research Objective 1: Determine the emigration potential of current engineering professionals in the South African petrochemical industry.

Research results have determined the emigration potential of engineering professionals in the South African petrochemical industry. The findings show the emigration potential to be high and that most engineers were applying jobs in the Middle East and Europe, with plans to stay for 3-6 years in the host region. The findings also showed that increased job challenge was more important to the engineers than a higher salary which opposed the view that engineers were only leaving due to higher salaries abroad.

7.3.2 Research Objective 2: To explore the demographic characteristics of the engineers who want to emigrate.

The results from the study have satisfied this objective by showing that the propensity of South African refinery engineers to emigration is driven by the same demographic societal structures that drive emigration of the general population. This was observed in the emigration age upslopes, peaks and downslopes which aligned to the main families of multiexponential model migration schedule. In terms of micro level societal structures like gender and ethnicity, the findings revealed the engineers with a positive emigration potential to be male dominated which characteristic of an unequal society. No conclusive emigration patterns driven by ethnicity due to lack of diversity in the sample. The main macrolevel societal structures that drive emigration were found to be economic instability due to a weakening currency (ZAR) and high inflation which leads to an increased cost of living. Other societal structures like political and religious persecution did not push engineers to seek work opportunities abroad.

7.3.3 Research Objective 3: Identify the main factors contributing to current employees wanting to emigrate.

The study identified the critical factors that drive the decision for engineers to emigrate to be a combination increasing financial pressure from declining macroeconomic environment, and dissatisfaction with the work environment. The main economic drivers were due to a rapidly reducing disposable income due to rising inflation, high cost of living, rising debt levels, high bank interest rates. The currency (ZAR) weakening against the US Dollar and Euro also made earnings in foreign currency more attractive. The work-related factors that drove emigration were a lack of career progression and feeling of stagnation, line manager favouritism and bias in the performance management process and poor work-life balance.

7.3.4 Research Objective 4: Propose strategies to reduce emigration of engineering professionals in the South African petroleum refining industry.

The study has met this objective by proposing strategies and interventions companies can use to the reduce the emigration potential of their employees. These interventions are to: (1) Conduct regular surveys to improve employee engagement and understand the needs of the employees to effectively resolve them. (2) Review the performance appraisal system to reductase of remove bias and subjectivity. (3) Develop management and technical specialist career progression plans and use them. (4) Hire line managers who are experienced in their field. (5) Ensure company benefits are aligned to the changing needs of the employees. (6) Have a recognition and rewards program that is free from favouritism. (7) Offer support to employees through an employee assistance program.

7.3.5 Research Objective 5: Propose hiring strategies that can be used to ensure a higher retention rate of future staff.

The findings from the research have led to hiring strategies that have satisfied the requirement of this objective. The millennial workforce is slowly starting to dominate the workforce making it important for refining companies to keep abreast of the needs of this workforce to remain competitive. The proposed hiring strategies include prioritizing internal recruitment to support the career progression succession plans and utilising job redesign strategy, maximizing use of technology to select the right candidate and reducing gender bias in the hiring process.

7.4 Chapter Summary:

This chapter evaluated whether study objectives were achieved. The strategies proposed included, adjusting the employee benefits to allow some flexibility in the work hours and remote working where possible, effective use of job rotation and enlargement strategies and having clear career progression paths, using the EAP to support employees to better deal with the rapidly changing macro-economic environment through financial and debt management counselling. Manager awareness training on bias, favouritism and inclusion needs to be conducted to achieve a fairer and more equitable workplace and resolve a cause of much unhappiness among the engineers. Figure 7.1 shows the proposed model from the study findings to reduce emigration potential of the engineers.

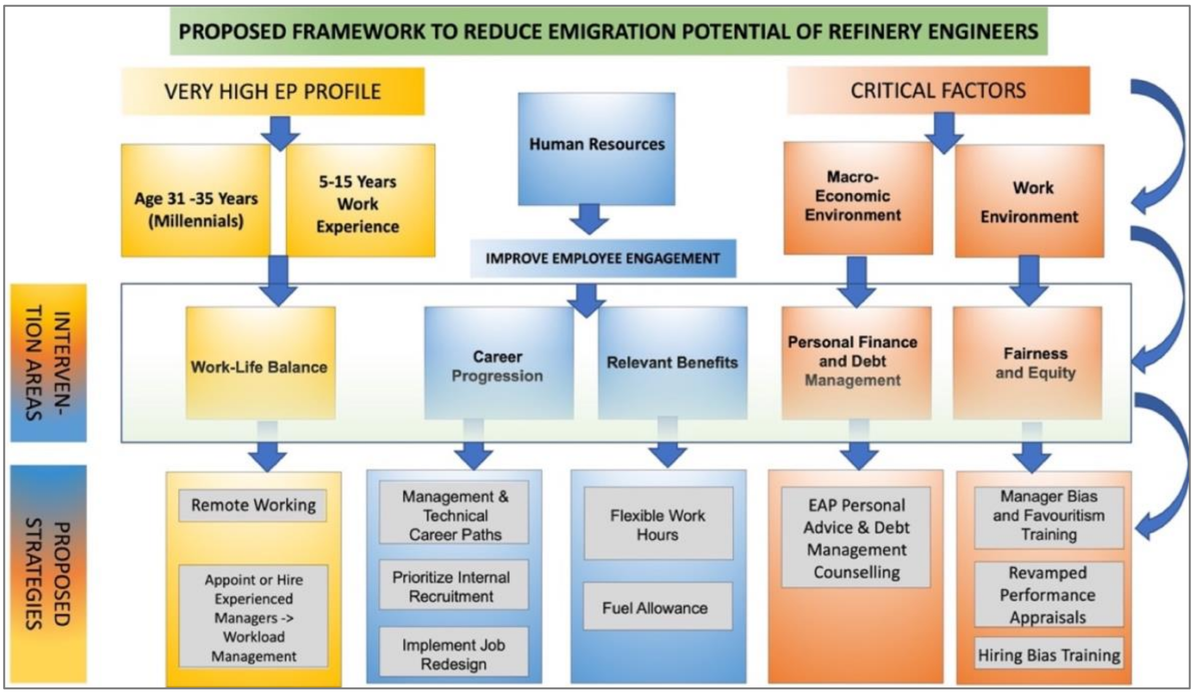


Figure 7.1: The proposed emigration potential reduction framework developed from the study findings (Source: Author)

CHAPTER 8: RECOMMENDATIONS AND CONCLUSIONS

8.1 Introduction

The study findings showed the emigration potential to be alarmingly high with more than half the participants actively applying for jobs and hoping to emigrate within the next two years. The emigration potential peak was found to be in the age group of 31-35 years, with 5-15 years working experience. The main driver for the high emigration potential was a combination macroeconomic and work-related factors. The study also revealed that the workforce trends within the refinery industry are consistent with the current broader workface trends, for example, millennials, between the ages of 24 and 39 (born between 198 and 1996). These millennials workforce trends include a higher mobility which results in job hopping, the desire for more flexible working hours and remote working, placing a higher importance on a happy work environment and willingness to accept short-term contracts and freelancing (McConnell, 2022; CIPD, 2019). With millennials workforce slow becoming the largest part of the workface, it is important for companies to adapt to these changes to remain competitive.

8.2 Overview of the Study

Chapter 1 introduced the study by providing the background, explained the research gap and motivation for the study. The problem statement is that the South African refineries are currently facing a brain drain and fuel security challenges. This due to the reducing refining capacity caused by poor reliability of aging assets and accidents, for example, fires and explosions which have led to long term shut downs. The significance of the study was to determine the emigration potential of South African engineers working in the Petrochemical sector, and to understand the reasons for their desire to emigrate by exploring the critical factors like demographics, salary, work environment, organisational leadership, and culture to understand the extent to which they have influenced the engineers to look for work opportunities abroad. The Implementation of strategies that curb the brain drain would increase profitability and fuel security by reducing the loss of critical tacit knowledge, expertise and experience which contributes to the current loss of refining efficiency, reduction in performance and reducing profitability of South Africa's petrochemical refineries (Guilding, Lamminaki & Mcmanus – as cited in Deri, Zaazi and Bazaanah 2021; De Long, 2002).

Chapter 2 entailed an in-depth review of academic literature and put in place the theoretical context and conceptual research framework to address the research questions. The two main areas of focus for theoretical context were the international migration theory as well as theories pertaining to work environment and motivation. The former focus area explored the neo classical economic theory and push and pull factors while the latter focus area explored the Adam's Equity Theory, Hertzberg's two-factor theory, and Maslow's Hierarchy of needs theory.

Chapter 3 presented and developed the best suited research methodology, research philosophy research design methods for this study. This study used a mixed-method approach combining interviews and electronic surveys. This approach was used because the blending of data from these two approaches provides a more detailed analysis which the qualitative and quantitative methods are unable to adequately do by themselves. (Dadhe 2016; Basias and Pollalis, 2018). The study achieved triangulation by comparing the results from two different data collection methods and using a unique data analysis technique applied for each data collection method. For example, survey questionnaire data was analysed by descriptive statistics and the structured interviews data was analysed using a combination of thematic analysis and descriptive analysis. While both the qualitative and quantitative methods were used, it is important to note that this research study leaned more towards the qualitative side (Basias and Pollalis, 2018; Johnson and Waterfield, 2004; Creswell, 2003). The study's research design conforms to the UKZN ethics requirements and is assigned the protocol number HSS/1774/016D by the ethics committee.

Chapter 4 analysed the collected data from the interviews using a combination of top-down theoretical thematic analysis and descriptive statics. The analysed data were presented in a structured format that enabled the study to address and answer each of the research question.

Chapter 5 analysed the collected data from the survey questionnaires using descriptive statics. The analysed data were presented in a structured format focusing on the emigration potential, the nature of the emigration in terms of preferred location and duration of stay in host country or region and the demographics of the engineers with a positive EP. The work environment and the influence of micro and macroeconomics on the emigration of the engineers was also explored.

Chapter 6 interrelated and compared the findings from interviews and the survey questionnaire discussed in Chapter 4 and chapter 5 respectively. Chapter showed good relatedness between findings emanating from the interviews those emanating from the survey questionnaire. The main similarities were the high number of positive EP engineers with the approaches showing more the half (56% for interviews and 52% for the surveys) of the engineers were actively applying for jobs located outside of South Africa. The top destination for both the data sets compared was the Middle East, with Europe as the 2nd most referred destination. The nature of emigration was mostly short term between 3 to 5 years. The demographics of the positive emigration engineers showed: The age range between 31-36 years had the highest emigration potential with an experience level of 5-15 years.

The first critical factor that influenced the decision to emigrated was a lack of career progression, particularly for participants who were in the same role for approximately 5 years or more and had developed feelings of stagnation and poor job challenge. The second critical factor was perceived favouritism in the performance management process where, promotions, recognition awards being reserved for cliques. The third critical factor was a lack of work life balance. This was primarily due to employees reporting to line managers with little relevant field experience which resulted in work overload, short deadlines, limited resources, and time. 61% of the survey respondents believed job challenge was more important than a higher salary abroad.

Chapter 7 presented the study findings and answers the research questions by determining the emigration potential of the interviewees and the survey participants. Emigration related factors such as the desired length of emigration, the preferred region and the demographic of the high EP group were also presented. The demographics particularly look at the age range, the experience level, and qualifications of the positive emigration potential candidates. Chapter 7 also discusses the critical factors in the workplace like career growth, relations with colleagues and managers.

Chapter 8 presented the study recommendations, the limitations of the study, the areas of future work, implications of the study and highlighted the contribution to the body of knowledge. Some of the study recommendations are to: (1) Have clear career progression paths and to use job redesign strategies to prevent feelings of career stagnation. (2) Reduce appraiser bias and subjectivity in performance appraisal process and incorporating appraisee feedback once the PA process. (3) Also, to investigate and apply methods reduce or eliminate bias from the performance review process, and to appoint experienced line managers and strengthen SMART goal setting (4) Provide relevant employee benefits of a dynamically changing workforce like flexible work hours to improve work-life balance. (5) Reduce hiring bias and hire more female engineers who had a lower emigration potential.

The study has contributed revealing the high emigration potential of South African refinery engineers and potential brain drain facing this industry. The study contributes by providing a method to quantify and evaluate the emigration potential using a five-by-five matrix that can be used to measure emigrations potential of respondents. Furthermore, this study also proposed and presented an interventions framework emanating from the study findings to reduce the emigration potential.

8.3 Recommendations of the Study

The findings of this study have provided clearer insight and deeper understanding of the potential brain drain facing South Africa's petroleum refining industry. This has contributed to the development of the below recommended seven strategies, or interventions, to help reduce the emigration potential of refining engineers.

8.3.1 Performance Appraisals

The performance appraisal process and recognition and rewards programs, which are intended to reward and motivate employees, are currently causing great employee dissatisfaction due to manager bias and favouritism. Human resources departments should implement mechanisms to reduce workplace bias, for example, analysing patters to identify any concerning salary disparities, visible differences in promotions and awards based on gender and ethnicity. With improved employee engagement through short surveys and interviews, the views, and perceptions of employees on career advancement can be ascertained to detect unconscious and/or intentional bias and favouritism that may not be otherwise visible or apparent. After managers receive formal training to raise awareness on workplace bias, diversity and equity, the human resource department should enforce accountability where implicit and explicit bias is identified to ensure fairness, thereby motivating and increase the productivity of employees (Biebly – as cited in Bjørnshagen, 2022).

8.3.2 Career Progression

The Human Resource department should develop clear career progression paths for both managerial and technical specialist progression. Where these progression paths already exist, they should be utilised to promote engineers who meet the requirements. The career progression planning should include job rotation and job enlargement strategies to keep the engineers challenged and counteract any feelings of career stagnation. An Internal recruitment a strategy should be prioritized to fill vacancies, which will compliment succession planning, career progression and job redesign strategies. In addition to nurturing growth within the company, increased internal recruitment also ensures that the vacancies are filled by candidate who familiar with the company culture.

8.3.3 Relevant Company Benefits

The current employee benefits strategy and work environment must be reviewed to ensure they meet the needs of a dynamically changing workforce. With millennials increasing in the labour force, transformation of the work environment into an enjoyable atmosphere is essential for success. Millennial workforce trends have shown that flexible work hours, and work life balance have increased in importance and should be a key part of the benefits strategy.

8.3.4 Work Environment and Culture

The study revealed the high-pressure refining environment to be stressful, and not enjoyable for the engineers. Work overload can be improved by appointing managers who have enough experience to allocate sufficient time to complete tasks which will help to improve work planning and reduce employee stress. An additional finding was that manager bias and favouritism in the workplace strained the employee-manager work relationship. An observation from this study is the need for support with management of personal financial finances and debt reduction strategies, due to a deteriorating macroeconomic environment resulting in relentless increases in interest rates and inflation.

8.3.5 Hiring Bias

Unconscious hiring bias based on race, physical appearance, age, gender etc. should be avoided. The refining engineering profession is male dominant, and unconscious gender bias where male engineers are preferred over female engineers should be prevented because, the study findings showed that female engineers had a lower emigration potential than their male colleagues. This is partly because the South African society is still transitioning from a traditional society into an equal society where citizens are on equal footing, irrespective of gender.

8.4 Contribution to body of knowledge

The outcomes of this study have contributed to refineries being able to quantify or measure of the emigration potential of their current employees and understanding the underlaying reasons for this severe critical skills loss which has plagued the industry in recent years. This study developed a five-by-five emigration potential matrix that can be used to measure emigrations potential. Furthermore, this study also proposed and presented an interventions framework emanating from the study findings that refining companies can use to reduce the emigration potential of their engineers.

8.5 Limitations of the of the Study

While the study has achieved the desired aims and objectives which was to determine the emigration potential of engineers in South Africa's petroleum refining industry, to understand the critical factors that influenced the decision to emigrate and to propose effective strategies companies can use to reduce the emigration potential of the engineers; the study had some limitations which are expounded upon in this section.

The survey questionnaire sample size was not large to conduct hypothesis testing of relationships between variables that emerge during the study. Also, a larger sample size would have allowed the study to conduct both statistical and analytical generalizations and would have resulted in greater diversity with regards to age, ethnicity, and gender. Greater diversity within the sample could also have been improved by utilising more sampling methods and data collection techniques to avoid the millennial generation dominance, who use technology more which resulted in a high response rate to the electronic surveys.

The second limitation was that some of the areas of focus were only covered by one of the two data collection methods. For example, the impact of qualification level on emigration potential was only covered by the survey questionnaire and not in the interviews. This reduced the strength of the analysis as the absence of blended data emanating from combination of approaches was not available.

The study being cross sectional means that it did not capture the views, feelings, perceptions, and experiences of the engineers at over point period. The study there lacked the ability to study the changes of these views, feelings, perceptions, and experience, due to changes in the macroeconomic environment and the workplace, over a longer period which longitudinal studies can provide.

While the study had these limitations, it contributed to developing a method to measure the emigration potential of refinery engineers, which was shown to be a cause for alarm. The study has also given a deeper understand to the main factors that drive this high emigration potential.

8.6 Suggested Area of Future Research

There are several gaps around the emigration potential of engineers that have emanated from the study.

While the study lacked ethnic diversity, it was noticeable that some of the ethnic groups, like the Coloured and Indian ethnic groups had no positive EP participants. The impact of ethnicity on emigration potential of refining engineers based on social structures and socioeconomic backgrounds should be explored further.

The study had a few female engineers who considered emigration. Future work can attempt to understand if the lower mobility due to traditional roles is still a barrier for female emigration in a transforming society i.e., the roles of being a wife and mother.

An area that emerged strongly, that was beyond the scope of this study was the elevated levels of unhappiness and frustration among the positive emigration potential group which can lead to counterproductive, deviant, work behaviours. Further research can be also done in this space.

8.7 Study Implications

The findings from the study showed an alarmingly high number of engineers have a positive emigration potential, with more than half (50%) of the engineers actively applying for jobs abroad and most having valuable work experience of 5-15 years. This potential loss of experienced engineers has practical implications in that it negatively impacts the stable and safe operation of the refineries, as well as the bottom line in terms of total revenue and profit.

The theoretical implication of this study is that it provides a method to measure and quantify emigration potential, which is a unique aspect within the field of migration studies that has not been widely covered. The EP Matrix developed through this study is the first of its nature within the field of migration studies which richly adds to the body of knowledge.

The managerial implications from this study showed how natural human behaviours, for example, close relationships with certain employees or groups of employees can result in perceived bias and favouritism which can sour the work environment. This calls for refining companies to invest in manager training on diversity and bias to heighten awareness and sensitivity on this crucial aspect of leadership and management. Also, support is required to help managers to develop a clear career development plan and to execute it as required with promotions and job rotations when they are due.

The implication for refining companies is that they must become adaptable to the changing needs of a new generation of employees i.e., Millennials and Gen Z generations, in terms of the company benefits offering like hybrid working which incorporates some remote working. The study has shown that Millennials value work-life balance and are more mobile if their needs are not met, resulting in high attrition rates.

8.8 Conclusions of the Study

The study has shed light on the alarmingly high rate of engineers actively applying for jobs overseas. The findings have debunked the view that emigration was solely due to higher salaries, and have highlighted a great deal of unhappiness, stress and frustration faced by the engineers caused by the work environment. Furthermore, South Africa's rapidly deteriorating macroeconomic environment was putting pressure on the engineer's disposable income. The findings also show that petroleum refining companies have not adapted their benefits offering to the changed needs of a new generation workers and should be reviewed to ensure the benefits remain relevant.

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Appendix A - Work environment data from the interviews

Participant	Goals Alignment	Growth Opportunities	Interpersonal Factors	Job Specific Factors	Personal Perceptions	Remuneration & Benefits	Performance Management	Advice
Interviewee 1	Company not a vehicle to achieving personal and career goals	No conferences (senior technical for training). Hit the ceiling – need to go elsewhere to grow further. Expats used for Manager Positions	Good relationships with manager and colleagues. Manager supportive.	Authoritarian culture. Works eats into family time. Work is frustrating – Forced positional move – enjoyed previous role. Work overload (no resources & time as those who've resigned aren't replaced)	No appreciation/recognition of efforts (verbal is enough).	-Not paid enough for experience and qualifications- Happy with benefits & rewards	PR Full of bias. Company KPIs not achievable.	Cultural Diversity Training to reduce bias
Interviewee 2	Career & Personal goals can be met.	Good growth through OJN and classroom training.	Great relationship with manager. Managers very fair & supportive. Does not micromanage	Looks forward to going to work – application of knowledge and growth in experience in the process. Work is challenging.	Verbal recognition of good work. Also, employee of the month.	Happy with Pay. Rewards systems in place. Benefits not aligned throughout organisation	Bias enforced through fault finding (even KPIs are met). Subjective because ranking is relative to another's performance.	Petrol Allowance

Interviewee 3	Personal goals not really – would like to be more financially comfortable.	Career progression is limited. Good training OJB. Limited, no openness to groom ladies into leadership positions.	Manager is fair & Supportive as best as he can. Gives direction easily. Courteous relationship with manager and colleagues.	Work is challenging in interesting. Tight deadlines. Job does not affect personal life.	Verbal recognition for good work. Feels like they add value.	Happy with pay. Rewards systems in place (star awards + PRs). Not making use of benefits – not applicable e.g., kids schooling & study assistance	Fair PR process. Cross-section of managers measure performance.	Choice of Benefits choices, a day off for standbys.
Interviewee 4	Career – goals can be met. Personal goals not e.g., paying off bond and early retirement.	Yes, technical over the years. Now managerial self-development and partly work courses. Career progression possible for specialist or managerial route (someone must move for managerial)	Good relationship with manager – approachable. Fair with colleagues.	Fulfilling work – learning new things. Good interactive network with international site – knowledge exchange. Supportive management. Good work-life balance. Dynamic environment – I prioritization is key!	good recognition (awards events).	No schooling benefit across all employees	Human element can be improved. What people say carries more weight than facts. But HR more active now (not passive) and challenge any observed bias).	Standardize benefits (high school not covered at all job groups). KPIs very tight (not achievable or realistic) linked to bonus so bonus is hard to achieve (LOPCs, Unit Availability,

									Safety Incidents).
Interviewee 5	Career goals can be met. Personal goals cannot be met – work takes up time required to focus on personal goals.	Received training – but advantaged by favouritism. Welcomes the work challenge - Growth by taking on work that's a level higher. Career progression – not likely – structure flat. Specialization paths exist but not used yet.	Double standards– no consistency in treatment – manager not fair always (personalized approach to each person comes across as bias). Manager very supportive.	Dynamic - job scope changes all the time. Clashing deadlines (clear priorities are essential) Standby, overtime – personal life suffers a bit.	No recognition for work produced. Jumping here and there	Happy with Pay. Happy with Benefits – kids' school is best one (primary – university).	Relationships count (& how you present yourself) more than work output & quality. Bias and Subjectivity complicated by clashing roles.	
Interviewee 6	Staying	-	-	-		-	-	-
Interviewee 7	Career goals not achievable. Personal goals cannot be achieved either.	Work is interesting and challenging. Good training. Limited career progression	Manager Bias (close friendships). Supportive but relationship is strained. Good relationships with colleagues.	Don't get enough work. Must scout for work from guys who are in the clique. Standby eats into personal life.	no recognition for contribution/value added – demotivating. Cliques based along ethnic group get work, recognition, and promotions.	Happy with Benefits.	KPIs are very subjective, filled with bias.	-
Interviewee 8	Career goals not achievable. Personal goals	Great technical exposure. Lack of Career progression troubling. Training is good.	Good relationship with manager. Holds everyone accountable.	Work affects personal life – take frustrations home. Politics over and above work. Limited	Benefits and rewards are subjective - earned through favouritism	Happy with Salary and benefits.	KPIs – Rewards is blurry – subjective	-

	can't be achieved either.	Growth by challenging and interesting work.	Supportive. Not too great with colleagues – poor delivery.	resources – multi-disciplinary teams fight for resources to complete their objectives.	(relationships/connections cliques)		(don't have meaning as they're not the centre). Work dynamic so KPIs lose relevance.	
Interviewee 9	Career goals achievable. Personal goals – not achievable (dependent on a higher salary).	Manager favouritism. Managers don't prioritize employee growth and Development – but opportunities are there (doesn't expect promotion to happen). Training and exposure have been excellent (OJB & Formal).	Relationship strained – pretentious. not supportive. Clash with colleague due to work (deviation to procedure to please customers).	Dynamic environments throw the new year to-do list out the window. Overloaded – dropping the ball, sinking – no resources with limited time. Work does not affect personal life.	No recognition and no appreciation. No progression for growth. Acting as Supervisor for long without being appointed.	Feels underpaid for qualification & level of experience.	Very subjective based on perception and not on delivery.	Employee would like a house allowance or subsidy.
Interviewee 10	Career goals cannot be achieved – hit the ceiling – had to move. Personal Goals not possible – no time to pursue them.	No formal training – had to teach self to get work done but job exposure is very good and challenging.	Manager unfair – didn't care about being overloaded. Not supportive. Strained – toxic relationship.	Overworked – took work home. Work of critical nature ate into personal lifetime. No work-life balance.	No appreciation for efforts and quality work – showed in poor rankings. Doing double work with no appreciation (no acting allowance).	Underpaid for competence and value provided.	Unfair bonus distribution between managers and employees but transparent. PR were skewed,	

							Buddy-buddy system. Fostered culture of boss pleasing.	
Interviewee 11	Career and personal goals can be achieved (some already achieved while at the company).	Good training, OJB and classroom with structure mentoring, conferences etc. Work is challenging and creative. Growth Limited, specialization is still developing in SA.	Manager is fair. Human element can be improved – "we are not machines – we have emotions.	Work affects personal life (breakdowns) but compensated time for time. Work very integrated (fields-wise),	Good recognition – name and face get put out there.	Happy salary and with benefits.	Bonus mostly Fair but transparency can improve. PRs are subjective (esp. when someone is disliked). Goals and targets are not measurable. Linked to promotion, increases etc.	-
Interviewee 12	Career goals – partially because job exposure is good. Personal	No training. No growth in terms of position or finance. Job content is good – you learn a lot, challenging.	Incompetent – poor delivery (project overruns). Hostile relationship. Not	Stress overworked (doing other people's work plus your own). Work affected personal life - long hours	No recognition or appreciation.	Underpaid. Not happy with salary and benefits.	Bonus bad – seen as expense not reward. Subjective	-

	goals have been achieved.		supportive but punitive.	(become despondent towards employer). Constant unplanned work – firefighting.			(mistakes get remembered by those who don't like you).	
Interviewee 13	Career goals cannot be achieved. Some personal goals can be achieved.	Buddy-buddy system for growth – not outputs driven (frustrating). No training – company not interested in employee development. No growth, limited exposure.	Managers Favouritism is driven by what he wants (self-serving). Incompetent in the field (cannot gauge work & responsibilities). Not supportive. Incredibly tense relationship (compliance vs pleasing clients).	Extremely negative towards job – no challenge (routine) but overloaded. Stressful due to critical nature, & no time and resources). Work affects personal life (moods swings due to stress).	No appreciation and not recognition. Can be verbal & financial recognition.	Not happy with salary – does not match outputs.	Bonus structure benefits mostly managers and executives. % Of TGR. Bonus not dependent KPI performance. PR subjective.	Focus on employee development and job rotation opportunities to learn new skills.
Interviewee 14	Career goals cannot be achieved (no time for studies – long hours). Personal goals can be achieved.	Fair training (good OJB-internal) but external training not adequate. Good career progression. Good job challenge. Progression matrix shows clear progression path – optimistic about it.	Favouritism - Selective listening by manager (some employees feeling undervalued). Good relationship	Work has a lot of internal politics. Family life strained – work extended hours during the week (stressful). More resources required to cope with	Good recognition and reward (verbal) from LT for good work.	Happy with salary and benefits.	Bonus structure not very transparent (needs to be simplified). PR subjective – diff	Petrol benefit would be appreciated.

			with manager and colleagues.	workload (resigned resource not replaced).			departments ranking your work which they don't know/	
Interviewee 15	Career goals can be achieved. Personal goals can be achieved.	Training inadequate. Mostly self-development. No career path so growth is limited. Challenging work.	Little support from management (10%). Manager inconsistent in treatment of subordinates (favouritisms). Not best relationship with manager.	Stressful - Mind preoccupied with work even when home. Chaotic, lack of accountability. Overloaded - Feels like drowning most of the time. Integrated work – end up doing your work + others work to get things done. Work affects personal life (working additional hours from home to keep up). Lack of resources (support from other functions).	Not enough recognition for quality work	. Happy with salary. No benefits.	Bonus structure does not measure what you do – weighting of variables skewed. PR done by people who aren't a client or customer – leaves room for bias.	Give certificate of recognition, awards to motivate employees. Transport allowance for days when using private car to do company work. Supplier audits etc. – 1 full tank a month would be enough.
Interviewee 16	Career goals can be achieved if boss leaves. Personal goal can be	Sufficient training opportunities – mostly self-development at current at current level. Limited	Nice manager but is bias (caused by people pleasing). Not experienced	Limited decision-making power. Being second guess – as the expert. Work affects	Fair recognition. (Lower levels recognition heavily dependent on direct boss).	Happy with salary. Schooling benefit. Work	Bonus – simple formula i.e., company	-

	achieved (financial independence)	growth (no shared responsibility – work & knowledge used as currency and being valued).	in field – so limited understanding in decision making. Supports with aim to shine (self-serving). Professional relationship with manager.	private life, but flexible work hours help with work-life balance. Work is dynamic and not integrated – so resources and time not an issue.		flexibility as a benefit.	makes money – everyone get rewarded effectively. Limited transparency though. PR limited – hold each other accountable to ensure bottom line is healthy.	
Interviewee 17	Career and personal goals cannot be met while in current company.	Inadequate training (came in with zero experience) but good OJB training. Good technical exposure–self-development. Eventually left PSA. Limited job in specialization in RSA (someone must leave or die).	Good relations with manager. Manger is fair but Company inconsistent/unfair with applying accountability.	Work is interesting, challenging & stressful. Short deadlines and unrealistic expectations due to reporting to inexperienced contractors/consultants. Job insecurity affects ability to make decisions.	Good recognition for good work.	Salary fair. No benefits as contractor.	Doesn't received bonus or PR as contractor. Sits with line every 6 months to discuss progress.	-
Interviewee 18	Career goals cannot be achieved. Personal	Good training OJB & classroom but limited growth opportunities limited but are there	Manager is fair and supportive. Relationship is Ok.	Workload can be much (hard to be manage and work simultaneously) Unable to create	Good employee recognition. Rewards for good work are there (chocolates) but can be	Happy with and benefits. Salary standardization	Can be restructured to be more equitable.	Job Rotational programs like is Europe or

	goals can be achieved.	(stagnation/saturation in same position).		conducive environment for people to work under you (no chance to see improvements and strengthen weaknesses). Work eats into life (long work hours). Work is challenging and interesting. Limited experienced resources (retention issue)	improved (currently no real significance to their lives).	throughout various business units and ethnic groups can improve.	Current % of TGR means managers and exec's get a much bigger bonus than the ground workers. PR not effective – not reflective of what people should be getting. Subjective.	Asia – 3-5 moves in a 10-year cycle. Choose among, maybe 3 or 4 different options, okay. Structure forums (managerial & technical) development for self-development.
Interviewee 19	Career goals cannot be achieved. Personal goals cannot be achieved.	Good training. Opportunities to grow technically – job scope, not management wise (no progression/growth).	Manager is fair – treats everyone equally. Competent employees not chosen for management positions (inexperienced	Work not very challenging (repetitive). Time are resources are enough.	Quality work is recognized but no reward for hard work.	No happy about salary. Paid on qualification alone, not experience. No real benefits	Happy with bonus structure and PRs.	

			managers appoint for ease of control)					
Interviewee 20	Staying – just got back from abroad.	Career is ramping up in new technical management role.	-	-	-	-	-	Salary scales across industry should be standardized to correct any inherent racial bias.
Interviewee 21	Staying – started a business.	-	-	-	-	-	-	-
Interviewee 22	Career goals cannot be achieved. Personal goals can be achieved (within their control).	Great exposure – crossed disciplined work. Training mostly OTJ. Limited progression – plan exists but not utilized – people with less experienced hired from outside who are of a different ethnic group (racially bias perception).	Manager not fair/has bias/favouritism when reprimanding. No support given to get work done.	Political work environment (depends on who you are & know). Work doesn't affect personal life. Integrated work – delays due to limited resources (not support to resolve resource constraint).	Not recognized - recognition is based on who you are. People take credit for your work/ideas/thoughts. No rewards (verbal acknowledgement is good enough reward).	Happy salary and Benefits.	PRs process doesn't work. KPIs don't count enough – line must justify performance to other committees that don't know your work/delivery.	Standardize benefits across all job groups (school allowance), overtime on emergency work/call outs.

Interviewee 23	Career goals can be achieved within organisation (not department). Personal Goals can be achieved.	Training is adequate both OJB & classroom/conferences. Limited growth in current department – but opportunities in other departments exist. No time and resource constraints.	Manager is fair. Supportive. Good relationship built on trust. Can talk to openly.	Job does not affect personal life.	Rewarded for good work, and recognition received. It has bias. Certs, Awards, monetary. (R1500-R2000).	Not happy with salary.	Fair Bonus pay out – but complicated calculations not very transparent. Not happy with PRs – unfair/bias in it (not visually related to performance). Favourites get good scores.	Have Flexi hours as a benefit.
Interviewee 24	Career and personal goals cannot be achieved while in company.	No training. No growth within company – career suicide (someone must leave or die). Work is interesting and challenging.	Managers don't care about subordinates' growth - No KPIs. Self-serving – only supports where he benefits directly/protects himself. Good relationship with line manager.	Work affects personal life – long work hours cut into family time. Enough time and resources.	No recognition or reward for good work.	Underpaid – not happy with salary.	No KPIs. Performance management has collapsed.	overtime - time for time should not apply for weekends. Flexi time as a benefit (working from home). Employee education

								assistance (open).
Interviewee 25	Career goals cannot be achieved. Personal goals – can be achieved.	OTJ training. Classroom training not adequate (critical thinking – to be holistic engineer).	Mostly balance, but you always find 1 favourite employee.	Job is repetitive, not exciting/interesting. Limited room to think outside the box. Challenging in terms of overloaded by doing others work – making sure they do their work it right. Work affects personal life (work-life balance hard).	Most of the time no recognition/appreciate because it's an expectation as an engineer. Not sufficient reward for work – acknowledged is all one needs.	Happy with salary – benefits could improve.	Bonus Structure is shocking. Linked to unavailability and not profit made. PRs clear on paper but very subjective (who spoke the most, who is liked).	Weekend away with family to as appreciation. Petrol Benefit. Working from home once a week.

Appendix B: Retention data from the interviews						
Participant	**Referral**	**Job Satisfaction**	**Deal Breakers**	**Barriers**	**Culture**	**Advice for Organisation**
Interviewee 1	No	Roles that are meaningful that people enjoy.	Forced positional move (business need)	Family, Children (schooling)	Top-down mentality, blame culture, working in silos.	Have inclusive culture (variety of ideas, views, opinions)
Interviewee 2	Yes	Roles that provide opportunity for technical growth (hands on experience, academic growth, good package.	Forced positional move (business need)	-	Safe reliable operation	Value and appreciate employee contributions (don't disregard them).
Interviewee 3	No, unhappy environment	-	Unethical leadership where self-respect is challenged	-	Driven by pressure (not performance), Stress.	Have aligned leadership
Interviewee 4	Yes	Job content fulfilling. Working grievance processes and be heard.	Series of traumatic events	-	Health, family friendly, productive.	Recognition of employees & holding line managers accountable (break people & teams).
Interviewee 5	Yes, with caution	Development has been good.	-	-	Make the loudest noise to get recognition (not necessarily hard working). There's a positive drive for Leaders to be more approachable and social.	People are curious to new experiences & exposure – Jon rotation every 4-6 years.
Interviewee 6	Yes	-		Children, family.		
Interviewee 7	Yes	-	Culture of Favouritism by line managers, lack of	-	Blame culture, fault finding, owing favours to each other.	Training on EQ & diversity training to stop racial

			racial inclusivity (language during work meetings). Authoritarian managers			stereotyping. Better succession planning & work overload.
Interviewee 8	Yes, experience and exposure are good.	Clarity around Progression and clear career paths	Lack of clarity around progression.	-	-	Create a culture that is open to ideas and fosters creativity in the workplace.
Interviewee 9	Yes, bigger picture – experienced. Steppingstone to working abroad.	Technical job content is fulfilling. Softer skills issues are a burden and demotivating	Force to compromise on ethical integrity	-	Safety, integrity, teamwork	LT in fighting due to clash of roles. Salary based on both experience and qualifications (industry certifications & qualifications). Technical View/Opinion to be valued. Improve soft skills in problem solving.
Interviewee 10	No, bad treatment	Good exposure.	Livelihood – salary. Not being valued by the organisation	-	Blame culture. Afraid to make decisions. Leadership created a toxic culture.	Fairness and consistency in punishment, acknowledgement, and recognition for going the extra mile,
Interviewee 11	Yes, good opportunities locally & internationally	Organisation Structured to help achieve career & personal goals. Opportunity to study at company expense.	Unfair treatment due to diversity. Fraud, unethical behaviours by manager	-	Collaborative, team effort, performance driven	Have more transparent leadership with regards to goals (changes etc).

		Work is interesting and challenging.				Uncertainly makes people unhappy.
Interviewee 12	No, grievances not resolved after a decade.		Employees not valued (views/opinions were ignored)	-	Crazy, firefighting, not appreciated (whatever you do is never good enough)	Be transparent – cut the lies. Listen and act on employee concerns/grievances
Interviewee 13	No, environment is about everything else but the work. Employee opinions not valued (but accepted when raised by someone else)	Work challenge is good and enjoyed it in the beginning. Challenge employees to do better.	Bias, condescending managers, tribalism, office politics, employee excellence not recognized - is seen as a threat to leadership.	-	Incompetent, lazy, excuses (for not doing the right thing), Bias, condescending managers, tribalism, office politics, employee excellence not recognized - is seen as a threat to leadership.	Improve communication (good or bad) and a clear vision (no more imbizo's), improve transparency. Fairness and consistency with all employees.
Interviewee 14	No, opinions not valued (but accepted when raised by someone else). Very demotivating and affects future behaviours.	Growing technically (knowledge and experience)	-	-	Safety of employees is paramount, honesty no matter how bad it is.	A good career progression plan, with follow through (people must not die for you to progress) Fair performance review Systems (affects remuneration)
Interviewee 15	No, no growth and	Lack of compliance to systems and	Accountability with no authority (with	-	Lack of ownership/responsibility, lack	Honesty and transparency with

	development, no managerial support. Opinions not valued (but accepted when said by someone else later)	procedures. No growth and development	no support /interventions to get people do their jobs)		of urgency (people don't know where they fit in the bigger picture), Bias (opportunities based on contacts/friendships – not performance. Firefighting. Fighting personalities.	employees. Limited communication about the future of the company. Invest in training, development, and mentorship program.
Interviewee 16	Yes, great work environment	Rankin g scraped because process not transparent - Grievances were listened to.	Scrapping of the bonus structure.	-	Politics bigger than delivery (past employer). Everyone wants to do everything – no shared responsibility. Executives don't contribute to a positive work culture.	Focus on growth through clear and suitable career paths (not in their current field – job rotation)
Interviewee 17	Not sure, new organisation (Old Chevron – Yes)	Not being made feel expandable (so being valued)	Lack of job security	-	Knowledge used as currency for job security (no shared responsibility). Lack of equal accountability (unfairness). Company knowledge shared along clique lines.	Clear progression planning (companies should take it seriously). Empower TLs/first line to be strong leaders, they set the tone for the company.
Interviewee 18	Yes	Growth Opportunities, incentives.	Unfair treatment and lack of appreciation	-	Lack of Inclusive culture	People development could improve. Positive vibes from Execs not translated down to the bottom guy by middle managers – that should improve. Forums for self-

						development (for managerial & technical roles). Transportation allowance.
Interviewee 19	Yes, learning continuously, continuous improvement.	Employees must feel listened to.	Being unhappy at work	-	Favouritism along racial lines. Leaders don't listen to subordinates.	Top Execs must understand the petrochemical environment, focus on both short and long-term planning (not just short term). Employ experienced people in management positions.
Interviewee 20	Staying, recently returned from abroad.	-	-	-	-	-
Interviewee 21	Staying, recently started a business	-	-	-	-	-
Interviewee 22	Yes (bottom level) Managerial (no) because managers get told what to do by their managers. They don't	Current role forced on them – lateral move (not happy about it). Poor career development.	Lack of career development.	-	Strong safety culture, strong communication through the periodic one-one manager-employee sessions.	Hiring qualified people for management positions. Equalize pay and benefits across all ethnic groups and job groups (perceived fairness)

	make their own decisions.					
Interviewee 23	Yes. Interesting work compared to steel plants.	Job is challenging and interesting.	Racial injustice and being undermined.	-	High performance culture. Puts a premium on excellence that makes you strive for more. Empowerment of previously disadvantage.	Clear communication sessions from Execs to workers are good. Created an environment that empowers all employees to feel comfortable inside the company (inclusivity).
Interviewee 24	No, no career progression (no career path).	Career growth and progression. Career suicide.	Salary compensation and career progression (no clear career path). Lower salary compared to industry standards (section head – salary is comparable to engineer elsewhere)	Family – Mossel Bay has a great family friendly environment.	Backstabbing (mistrust), not leading by company values (integrity, stewardship).	Care for employees and the value they bring to the table. Listen to employees. Execs to lead by example.
Interviewee 25	No, the culture isn't good + expats hired to training ground with higher position and benefits	-	Promoting someone who isn't as experience or qualified as me.	-	Blame culture. Name dropping to get work done. LT too old stuck in their ways – not open new ways of working/views.	Acceptance of mistakes/learning culture. Shared responsibility and accountability (empowered to make decisions).

Appendix C: Electronic Survey Questionnaire

Dear respondent,

My name is Ntsikelelo Sipho Ngonyoza. I am a researcher carrying out a study towards a PhD with the University of KwaZulu-Natal in Durban, South Africa. The thesis is entitled, **Strategies to reduce the emigration of Engineering Professionals in the South African Petroleum Refining Industry.**

The research objectives for the study are as follows:

- Determine the emigration potential of current staff.
- Determine if the desire to emigrations is related to any societal structures.
- Identify the main factors contributing to current employees wanting to emigrate.
- Propose strategies to reduce emigration of engineering professionals in the South African Petroleum Refining Industry.
- Propose hiring strategies that can be used to ensure a higher retention rate of future staff.

Please note that your views and responses shall only be used towards generalized study findings, individual responses will not be identifiable. In line with research ethics, the privacy of all respondents will be always maintained. No reputational damage or emotional harm will be caused to you Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN. Your participation in this study is voluntary. Thank you for your valued contribution!

INSTRUCTIONS:

1. Please write in the spaces provided, where appropriate.
2. Please tick the boxes provided, where relevant.

Demographic Details:

Name and Surname (Optional): ....

	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
Age									

	Male	Female
Gender		

	Black	White	Coloured	Indian	Asian	Mixed Race	Other: Please Specify
Race							

	Single	Married	Divorced	Widowed
Marital Status				

	Please specify
Home Language	

	Chemical	Mechanical	Metallurgical	Electrical	Civil	Industrial	Please Specify
Engineering Discipline							

	Please Specify
Highest Qualification	

	Yes	No
Are you currently employed in the Petroleum Refining Industry?		

	<1 year	1-2 Years	3-4 years	5-10 years	11-15 years	16-20 years	>20 years
Years of working experience in Petroleum Industry?							

	Yes	No
Have you ever been worked aboard before (permanent of contract)?		

	Yes	No
Do you have close friends who have who are working abroad?		

	1	2	3	4	5	6	7
If you were to emigrate, indicate the number of family members you would emigrate with?							

Section A: Emigration Potential for Working Abroad

Section A: No.	Statement	Strongly Disagree	Slightly Disagree	Undecided	Slightly Agree	Strongly Agree
A01	I have given extensive though to the possibility of working abroad.					
A02	I have a strong desire to work abroad					
A03	I am planning to abroad within the next two years					
A04	I am planning to work abroad within the next five years					
A05	I am researching living conditions (abroad)					
A06	I am searching for employment opportunities abroad on the internet					
A07	I am looking for work through recruitment agencies					
A08	I have friends/social links working abroad					
A09	I have applied for a job abroad					
A10	I have obtained information about potential employment abroad					
A11	I have been contacted by a recruitment agency about potential employment abroad					

Nature of Emigration: If you emigrate, how long do you intend on staying abroad?

A12	Duration Abroad	Please Tick Relevant Box
	Less than 1 Year	
	1 - 2 Years	
	2 - 3 Years	
	3 - 4 Years	
	4-5 years	
	Permanent if possible	
	Undecided	

If had to work abroad in which country, would you choose to work?

A13	Location/Region to Abroad	Please Tick Relevant Box
	Saudi-Arabia	
	United Arab Emirates	
	Oman	
	Kuwait	
	Qatar	
	Bahrain	
	Other: Please Specify	

Barriers: How do the following statements affect your decision on moving abroad?

Section A No	Statement	Strongly Disagree	Slightly Disagree	Undecided	Slightly Agree	Strongly Agree
A14	My partner does not want us to move abroad					
A15	I am concerned about separating from my family					
A16	I am not fully confident to work abroad yet					
A17	I have a good job in South Africa					
A18	The costs of moving abroad are too high					
A19	The cost of living in my target country are higher than in South Africa					
A20	My qualifications will not be valued or recognised abroad like they are in South Africa					
A21	My family will have difficulty adjusting to life abroad					
A21	I fear losing my right to religious liberty					
A22	I fear that the value of my pension will decrease					

Salary Differential: Please tick the statement that best represents your salary expectation for you to move abroad.

Section A	Statement – Salary Differential	Please Tick
A23	I am only willing to emigrate for a minimum 5% more than my current gross salary	
A24	I am only willing will emigrate for minimum of 15% more than my current gross salary	
A25	I am only willing will emigrate for minimum 25% more than my current gross salary	
A26	I am only willing will emigrate for a minimum of 35% more than my current gross salary	
A27	I am only willing to emigrate for a minimum 45% more than my current gross salary	
A28	I am only willing to emigrate for a minimum 55% more than my current gross salary	
A29	I am only willing to emigrate for a minimum 65% more than my current gross salary	
A30	I am only willing to emigrate for a minimum 75% more than my current gross salary	
A31	I am only willing to emigrate for a minimum 85% more than my current gross salary	
A32	I am only willing will emigrate for a minimum of 95% more than my current gross salary	

Please tick the box that best represents your current view.

A33	At present, a higher salary is more important to me that an interesting and challenging job	True	False

Tick the relevant options. If I received an interest free on month salary advance deductible from your salary over one year, I would:

Section A No	Statement	Strongly Disagree	Slightly Disagree	Undecided	Slightly Agree	Strongly Agree
A33	Go shopping					
A34	Put it towards paying my car instalments					
A35	Purchase a second car					
A36	Put it towards paying my home loan/mortgage					
A37	Use it for entertainment					
A38	Put it towards a nice holiday trip					

A39	Put it towards a deposit for a home loan					
A40	Put it towards paying off debt					
A41	Put it towards school fees					
A42	Put it towards financially assisting my parents/siblings/cousins					
	Others: Please specify below					
A43						
A44						
A45						

Section B: Push Factors

(i) Political Factors: To what degree do the factors below contribute i.e., push you from South Africa towards a move abroad? Do you think these will improve, stay the same or get worse?

Section B No.	Political Push Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree
B01	High Levels of Taxation					
B02	High Political Uncertainty					
B03	High Levels of Corruption in Government					
B04	Black Economic Empowerment (BEE) & Affirmative Action					
	Others: Please Specify Below					
B05						
B06						
B07						

No.	Get Worse	Stay the Same	Improve
B01			
B02			
B03			
B04			
B05			
B06			
B07			

(ii) Economic Factors: To what degree do the factors below contribute i.e., push you from South Africa towards a move abroad? Do you think these will improve, stay the same or get worse?

No.	Economic Push Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree

No.	Get Worse	Stay the Same	Improve

B08	Unstable and Weak Currency (Rand)					
B09	High Cost of Living in South Africa					
B10	Poor Infrastructural Development and Maintenance					
B11	Low Quality of Life					
	Others: Please Specify Below					
B12						
B13						
B14						

B08a			
B09a			
B10a			
B11a			
B12a			
B13a			
B14a			

(iii) Social Push Factors: To what degree do the factors below contribute i.e., push you from South Africa towards a move abroad? Do you think these will improve, stay the same or get worse?

No.	Social Push Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree
B15	High Level of Violent Crime in South Africa					
B16	High Levels of Racism					
B17	Poor Standard of Education					
B18	Poor Level of Service Delivery by Public Sector					
B19	High Levels of Poverty and Inequality					
	Others: Please Specify Below					
B20						
B21						
B22						

No.	Get Worse	Stay the Same	Improve
B15a			
B16a			
B17a			
B18a			
B19a			
B20a			
B21a			
B22a			

Section C: Circumstance Comparison

(i) Political Pull Factors: To what degree do the factors below attract you i.e., pull you towards a move to your selected host country? Do you think these will improve, stay the same or get worse?

Section D No.	Political Pull Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree

No.	Get Worse	Stay the Same	Improve

C01	Low Levels of Taxation							C01a			
C02	Low Political Uncertainty							C02a			
C03	Low Corruption in Government							C03a			
C04	No Black Economic Empowerment (BEE) & Affirmative Action							C04a			
	Others: Please Specify Below										
C05								C05a			
C06								C06a			
C07								C07a			

(ii) Economic Pull Factors: To what degree do the factors below attract you i.e., pull you towards a move to your selected host country? Do you think these will improve, stay the same or get worse?

No.	Economic Pull Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree		No.	Get Worse	Stay the Same	Improve
C08	Strong Currency of host country							C08a			
C09	Low Cost of Living in host country							C09a			
C10	Good Infrastructure and maintenance in host country							C10a			
C11	Good Quality of Life offered host country							C11a			
	Others: Please Specify Below										
C12								C12a			
C13								C13a			
C14								C14a			

(iii) Social Pull Factors: To what degree do the factors below attract you i.e., pull you, towards a move to your selected host country? Please also state if you think these will stay the same, improve or get worse.

No.	Social Pull Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree		No.	Get Worse	Stay the Same	Improve
C15	Low Level of Violent Crime in host country							C15a			

C16	Lack of Racism in host country					
C17	High Standard of Education in host country					
C18	Good Level of Service Delivery by Public Sector in host country					
C19	Low Levels of Poverty and Inequality in host country					
	Others: Please Specify Below					
C20						
C21						
C22						

C16a			
C17a			
C18a			
C19a			
C20a			
C21a			
C22a			

Section D: Work Environment Factors

(i) Please indicate to what degree do the factors/statements represent your current views? Please also state if you think these will stay the same, improve or get worse.

Section C No	Work Environment Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree
D01	My organisation Work-Place Safety is great					
D02	My organisation has Great Promotion Opportunities					
D03	I receive Training and Growth in areas that interest me					
D04	I am happy with the Organisational Leadership.					
D05	My job is not stressful					
D06	I am fairly paid for my qualification and experience					
D07	I Find my job interesting and challenging					
D08	My organisation affords me the opportunity to gain International Experience.					
D09	My work is appreciation					

No.	Get Worse	Stay the Same	Improve
D01a			
D02a			
D03a			
D04a			
D05a			
D06a			
D07a			
D08a			
D09a			

D10	I am Rewarded for the high quality of my work						D10a			
D11	I feel that my work colleagues are competent						D11a			
D12	I have good Inter-Personal Relationships with my colleagues						D12a			
D13	My direct line manager/supervisor shows no favouritism						D13a			
D14	I've been in the same position too long						D14a			
D15	The skills acquire in my current role are transferrable to other roles in the organisation that interest me						D15a			
D16	My work is important and contributes to society						D16a			
D17	I can achieve my personal goals while working at my current company						D17a			
D18	I can achieve my career goals while working in my current company						D18a			
D19	The organisation is well known and respected in society						D19a			
	Others: Please Specify Below									
D20							D20a			
D21							D21a			

Section E: Retention Factors:

To what degree do the following Factors contribute to you wanting to remain in South Africa?

Section D No.	Retention Factors:	Very Low Degree	Low Degree	Medium Degree	High Degree	Very high Degree
E01	Family and Friends in RSA					
E02	Lifestyle in SA					
E03	A good salary in SA					
E04	Good climate in SA					
E05	Patriotism					
E06	Steady Career Advancement i.e., promotions					
E07	Being part of a fast-track management program.					
E08	Reporting to a great manager					
E09	Established Business/Career in SA					
E10	Loss of Company Share Options If I resign.					

E11	Recognition for my work					
E12	Good work-life balance					
E13	Reward for my work					
E14	Attention from my leaders					
E15	Current growth and Development Opportunities e.g., opportunity to lead projects.					
E16	Good Work Challenge					
	Others: Please Specify Below					
E17						

Thank You for Your Valuable Contribution!!

Appendix D: Interview Guide

Dear Sir/Ma'am,

My name is Ntsikelelo Sipho Ngonyoza. I am a researcher carrying out a study towards a PhD with the University of Kwazulu-Natal in Durban, South Africa. The thesis is entitled, **Strategies to reduce the emigration Engineering Professionals in the South African Petroleum Refining Industry.**

The research objectives for the study are as follows:

- Determine the emigration potential of current staff.
- Determine if the desire to emigrations is related to any societal structures.
- Identify the main factors contributing to current employees wanting to emigrate.
- Propose strategies to reduce emigration of engineering professionals in the South African Petroleum Refining Industry.
- Propose hiring strategies that can be used to ensure a higher retention rate of future staff.

Please note that your views and responses during this interview session shall only be used towards generalized study findings, individual responses will not be identifiable. In line with research ethics, your privacy will be always maintained. No reputational damage or emotional harm will be caused to you Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN. Your participation is voluntary, and you are free to stop the interview, and withdraw at any point during the interview. Also please do not hesitate to express discomfort if any is felt at any point during the interview.
The interview is divided into the following 5 Sections:

- Section 1: Demographic Details
- Section 2: Emigration Potential and Barriers
- Section 3: Push-Pull Factors (Political, Economic and Social)
- Section 4: Work Environment
- Section 5: Retention of Skilled Employees.

Date:

Place:

Position:

Section 1: Biographic Details:

1. What is your age?
2. What is your marital status?
3. What is your engineering discipline?
4. How many years of working experience do you have within your discipline?

Section 2: Emigration Potential and Barriers

A work opportunity abroad can be attractive depending on one's current situation and aspirations.

5. Have you given any thought to working in the abroad?

   If yes,

6. Where would be your country of choice for working abroad? Why?
7. Have you taken any steps towards making this thought a reality?
8. Do you have any close friends who are currently working abroad?
9. How often do you discuss the possibility of working abroad with your family and friends?
10. How likely is it that you will move in the next 2 years?
11. How likely is it that you will move in the next 5 years?
12. If you were to work abroad, how long would you consider staying?
13. Do you have any barriers that prevent you from working abroad?

    If answer was No to Question 1:

14. Is there any particular reason why you have not considered working abroad?

Section 3: Push-Pull Factors (Political, Economic and Social)

There are many factors that contribute to one's desire to either remain working in one's home country, or to take up an opportunity to work abroad. These factors can be broadly broken down into Political, Economic and Social Push and Pull Factors.

15. Are there any political factors that contribute to your desire to work in the Middle East or to stay? (Examples of Tax, Corruption, Instability, Affirmation Action, BEE etc. will be provided, if required)
16. Are there any economic factors that contribute to your desire to work in the Middle East or to stay? (Examples of Cost of living, infrastructure, Unstable/Weak Currency etc. will be provided, if required)
17. Are there any social factors that contribute to your desire to work in the Middle East or to stay? (Examples of Poor Deliver of Public Services, Poverty, Violent Crime, Racism etc. will be provided, if required)
18. What percentage increase of your gross salary are you willing to emigrate for i.e., 25%, 50%, 100% (double) etc.?

Section 4: Work Environment & Motivation

19. How do you feel about your work environment?
20. Do you feel like you are adequate training i.e., on the job/classroom? Please elaborate.
21. Do you feel that high quality work is appreciated and recognised? Please elaborate.
22. Do you feel like you get sufficient reward for you work? Please elaborate.
23. Is the work assigned to you within your level competence? Please elaborate.
24. Does your job affect your personal life in any way? Please elaborate.
25. Are you happy with the non-monetary benefits offered by your organisation?
26. What are your views on your current growth opportunities in your field/career?
27. Do you find your work challenging, interesting and creative?
28. Do you feel like your presence is adding value to your company? Please elaborate.
29. Can the tasks assigned to you be achieved with the resources and time available?
30. What is your view on your line manager’s fairness in the way he treats his subordinates?
31. Does your manager take an interest in assisting to resolve the challenges in your role?
32. How would you describe your relationship with your colleagues and your line manager?

33. What are you views on your current and future career progression?
34. Do you feel fairly compensated for your qualification and level of experience?
35. Do you feel that your career goals can be achieved while working for your current organisation?
36. Do you feel that your personal goals can be achieved while working for your current organisation?
37. Do you feel about the importance of your work and its impact or contribution to society?
38. How you feel about the structure of your company's performance bonus?
39. How is your view on your company's performance review process?

Section 5: Retention

40. Would you refer someone to work in your organisation?
41. Knowing what you know now about your job, would you apply for your current job if you could do it all over again? Please elaborate.
42. If you were to quit tomorrow, what would your reason be for quitting?
43. Describe your view on your company's organisational culture in 3 words.
44. Are you able to recite your company's mission and vison statements from memory?
45. Does your company's executive team contribute towards a positive work culture?
46. What do you think your company or companies in general can do, to keep/make their employees happy and thereby retain them?
47. Do you feel like your opinion is valued and taken seriously? Please elaborate.
48. Do you see yourself working for your current company 1-2 years from now? Elaborate.
49. Would you describe your work life as being fun and enjoyable?

Thank you for your valuable contribution!!

Appendix E: Informed Consent Form

Informed Consent Letter 3C

UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Doctor of Business Administration (DBA) Research Project

Researcher: Ntsikelelo Sipho Ngonyoza (+27 82 841 9673)

Supervisor: Bibi Zaheenah Chummun (+27 31 260 8943)

Research Office: hssrec@ukzn.ac.za (031 3587/4457/8350)

Dear Respondent,

The purpose of this study is to develop organisational strategies that reduce the emigration of Engineering Professionals in the South African Petroleum Refining Industry.

You will be asked a few questions regarding your immigration potential and work environment and your answers will be for use by the researcher only.

We do not anticipate any risks, grievances or inconveniences resulting from this study. If there are any questions posed to you during the study where you feel discomfort, embarrassment or you feel are infringing upon your privacy, you have the right to not answer them.

Your participation in this research is voluntary. Refusal to participate, withdrawal of consent or discontinued participation in the study will not result in any penalty or loss of benefits.

The results of this study will be presented anonymously, without your identity disclosed, and without identification of rank if it could lead to the identification of the employee.

This page is to be retained by participant.

UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Doctor of Business Administration (DBA) Research Project

Researcher: Ntsikelelo Sipho Ngonyoza (+27 82 841 9673)

Supervisor: Bibi Zaheenah Chummun (+27 31 260 8943)

Research Office: hssrec@ukzn.ac.za (031 3587/4457/8350)

CONSENT

I...(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT DATE

...

This page is to be retained by researcher .

Appendix F: Gatekeeper Letter

GATEKEEPER LETTER

Title of Project: Strategies to Reduce the Emigration of Engineering Professionals in the South African Petroleum Refining Industry.

Researcher: Mr. Ntsikelelo Ngonyoza

Research Supervisor: Professor Theuns Pelser

Please tick to confirm your understanding of the study and that you are happy for your organisation to take part and your facilities to be used to host parts of the project.

1. I confirm that I have read and understand the information provided for the study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☑
2. I understand that participation of our organisation and students/members in the research is voluntary and that they are free to withdraw at any time, without giving a reason and that this will not affect legal rights. ☑
3. I understand that any personal information collected during the study will be anonymised and remain confidential. ☑
4. I agree for our organisation and employees to take part in the above study. ☑

Name of Organisation: Sapref

Name of Gatekeeper: L Khuzwayo **Date:** 01/12/2016 **Signature:**

Name of Researcher: Ntsikelelo Ngonyoza **Date:** 03/12/16 **Signature:** [redacted]

3

Appendix G: Editors Letter

LLiWO

Consulting Services

Blazing New Trails

12 BLOCK NN
SOSHANGUVE
0152

03 August 2023

To whom it may concern

REF: PROOF OF EDITING

This letter serves to confirm that a dissertation PhD titled "**"Strategies to reduce the emigration of Engineering Professionals in the South African Petroleum Refining Industry**" by Ntsikelelo Sipho Ngonyoza meant for submission to the University of KwaZulu-Natal was received for editing. I hereby confirm that the dissertation was edited by me according to my knowledge and ability.

Should any additional information be required in this regard, please do not hesitate to contact me through phone call or email.

Yours faithfully

[redacted]

Emmanuel Ndhlovu (Editor and Research Consultant)
manundhl@gmail.com
+27731458524
BA Hons (English), BA Hons, MA, PhD (Development Studies) (UNISA)

Appendix H: Ethical Clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

20 April 2022

Ntsikelelo Sipho Ngonyoza 216044161
Graduate School of Business and Leadership
Westville Campus

Dear NS Ngonyoza

Protocol Reference Number: HSS/1774/016D
Project title: Strategies to reduce the emigration of Engineering Professionals in the South African Petroleum Refining Industry

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 29 March 2022 has now been approved as follows:

- Change in Supervisor: Adding co-supervisor (Dr. Bibi Z. Chummun)

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

Best wishes for the successful completion of your research protocol.

Yours faithfully

[redacted]

....

Professor Dipane Hlalele (Chair)

/dd