An exploration of the effect of employee engagement on performance in the petrochemical industry

by

Dinko Herman Boikanyo

20947224

Mini-Dissertation submitted for the degree *Masters in Business Administration (MBA)* at the Potchefstroom Business School of the North West University

Study Leader: M. M. Heyns

2012

REMARKS

The reader is reminded of the following:

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ABSTRACT

Title: An exploration of the effect of employee engagement on performance in the petrochemical industry

Key terms: Engagement, vigour, dedication, absorption, quality, total quality management, organisational performance, petrochemical industry

The general aim of the study was to determine the effect of employee engagement on performance in a form of quality in the petrochemical industry. This type of study has never been conducted within this particular environment and as such a valuable contribution could be made to more effective performance management within this context.

Two questionnaires were administered, namely the Utrecht Work Engagement Scale (UWES) and Total Quality Management. A response rate of 83% was obtained from a sample of 200 employees.

The data showed a statistically significant positive relationship between employee engagement and TQM dimensions. The data also showed that there were some significant differences for various demographic groups and their level of engagement.
Managers need to enable an organisation to attract, develop and retain highly engaged employees to ensure a sustainable competitive advantage.
Limitations within the study were identified and recommendations for future research were made.

ACKNOWLEDGEMENTS

I would like to express my sincere thanks and appreciation to the following people, without whom this research would not have been possible:

- My first gratitude goes to the Father, the Son (my Lord and Saviour Jesus Christ) and the Holy Spirit, for carrying me throughout this enduring and yet so enriching project.

- Ms Marita Heyns, my supervisor, for her professional guidance and contributions in completing the dissertation.

- Mr Sibusiso Ndzukuma for his assistance regarding the statistical processing.

- Mr. Keith Hanson for the language editing.

- My wife, Dorcas Boikanyo, for your love, support and patience. Also to my precious family; Odirile, Kutlwano, Kemoneilwe, Reabetswe and Lefa for their love and hugs.

- My mother for reminding me of the importance of always being humble and my father for instilling in me the value of a good education. Also to my brothers and sister for their love and influence in my life.

- A special word of thanks to the Sasol management for granting me permission to conduct the research and employees who completed the questionnaires.

- To the PBS and the various lecturers that have influenced my life in ways I still need to explore. It was worth every minute.

- My study group. You guys have been amazing for the entire 3 years. Thank you for always being willing to help and for the amazing support.

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CHAPTER 1: CONTEXTUALISATION OF THE STUDY

1.1 INTRODUCTION

This study focuses on the effect of employee engagement on the performance of the supply chain in a petrochemical industry.

This chapter provides the background and problem statement of this study. The primary and secondary objectives of the study are subsequently presented, together with the methodology used, in order to achieve these objectives. Limitations of the study are also highlighted. It concludes with an overview of the structure of the study by briefly describing the content of each chapter.

1.2 BACKGROUND

To survive and compete successfully in today's turbulent economic environment, organisations require employees to be pro-active, show initiative and remain committed to performing at high standards (Bakker & Leiter, 2010:181). Organisational agility requires employees who exhibit energy and self-confidence and demonstrate genuine enthusiasm and passion for their work (Bakker & Schaufeli, 2008:147). Summing up, modern organisations need an engaged work force.

Employees who are engaged want to contribute, have a sense of belonging, defend the organisation, work hard and are not interested in moving to other employers. Employees, who are not engaged, cause a gap between employees' effort and their organisational effectiveness. This significantly affects an organisation's financial performance (Minton-Eversole, 2007).

The focus of this research will be on the influence of engagement on supply chain performance in a petrochemical company. This company operates production facilities in South Africa and supplies a range of chemicals to local and international markets. Its competitive advantage lies in its people and its unique technology and products. The manufacturing of good quality products is not only dependent on the technology and operating equipment used, it is also dependent on the operators and effective

management of the whole supply chain. The performance of the supply chain is dependent on the workers having pride in their work. The degree to which these employees are engaged is therefore critically important for the success of the business.

1.3 PROBLEM STATEMENT

In recent years, there has been a great deal of interest in employee engagement. Many have claimed that employee engagement predicts employee outcomes, organisational success, and financial performance (e.g. total shareholder return) (Bates, 2004:45). Thus the literatures indicate that employee engagement is closely linked with organisational performance outcomes. Casual observation suggests that much of the appeal to organisational management is driven by claims that employee engagement ensures bottom-line results. Indeed, at least one HR consulting firm (Hewitt Associates LLC, 2005) indicates that they ‘‘have established a conclusive, compelling relationship between engagement and profitability through higher productivity, sales, customer satisfaction, and employee retention.’’

On the other hand, companies with disengaged employees suffer from waste of effort and ineffective talent, earn less commitment from the employees, face increased absenteeism and have less customer orientation, less productivity, and reduced operating and net profit margins (Rampersad, 2006:19)

Stockley (2007) defines engagement as the extent to which an employee believes in the mission, purpose, and values of an organisation, and demonstrates that commitment through their actions as an employee and his or her attitude towards the employer and customers. According to Gebauer (2008), engagement is a measure to determine the level of buy-in by evaluating employees’ behaviour. It measures the level of connection employees feel with their employer, as demonstrated by their willingness and ability to help their organisation succeed, largely by providing discretionary effort on a sustained basis (Gebauer, 2008).

Robison (2007) classify employees into one of the following three categories: engaged, not engaged, or actively disengaged. According to this author, engaged employees

work with passion and feel a profound connection to their organisation. They drive innovation and move the organisation forward. Not-engaged employees are employees who are at work, but are making no active contribution to the success of the organisation. They are putting in their time, but no energy or passion into their work. Actively disengaged employees are not just unhappy at work, but also act out their unhappiness. These workers undermine the efforts of engaged workers.

Over the past decade, there has been an increasing emphasis on supply chain management as a vehicle through which firms can achieve competitive advantage in markets (Collin, 2003:8). As Christopher (1998:130) states, it is not actually individual companies that compete with each other nowadays; the competition is between rival supply chains. Therefore, management of supply chains in a business environment has a major financial impact on all the parties involved in the chain. Supply chain management is the integration and management of supply chain organisations and activities through co-operative organisational relationships, effective business processes and a high level of information sharing to create high performing value systems that provide member organisations with sustainable competitive advantage (Handfield, 2002:38).

Morgan (2004:525) divides traditional performance measures into four categories: financial, operations, marketing and quality. Financial measures are common measures like stock turnover, current ratio, gross profit and gearing. Those metrics are available after some time period, when the production action is already carried out. The problem of using financial metrics is that those are not relevant in day-to-day operations. According to Morgan (2004:525), actually financial metrics are more useful at top management level, where the strategic decisions are made. Operations measures are operations lead-time, labour utility, set-up time, machine utility and process. These metrics are useful for low level management who are dealing with day to day business. Marketing measures are market share, orders on hand, order lead-times, delivery performance and actual marketing time .Quality measures are percentage of re-work, rejects, conformance, scrap, liability costs and the kinds of measures that result in poor product quality (Morgan, 2004:526).

The costs of poor quality are the costs that result from products not meeting customer specifications, or which do not meet the designer's design intent. These costs are categorized into internal failure costs, including scrap and rework. It also includes appraisal costs (inspection) and prevention costs (systems and procedures). External costs include the cost of rework, inspection, and warranty investigations, which result after the product has left the manufacturing facility (Jacobs & Chase, 2006).

This study will be limited to product quality as a measure of supply chain performance. Quality today is studied under the overall umbrella of 'Total Quality Management (TQM)'. Lau and Tang (2009:410) define TQM as the management philosophy and company practices that aim to harness the human and material resources of an organisation in the most effective way to achieve the objectives of the organisation. TQM is further explained as a management-led process to obtain the involvement of all employees, in the continuous improvement of the performance of all activities, as part of the normal business to meet the needs and satisfaction of both the internal and external customers.

Karia and Asaari (2006:30) define TQM practices (what an organisation does to demonstrate its commitment to TQM) as a set of practical measures such as:

- continuous improvement;
- meeting customer requirements;
- reducing re-work;
- long-range thinking;
- increased employee involvement and teamwork;
- process redesign , competitive bench-marking;
- team-based problem solving;
- continuous monitoring of results; and
- closer relationship with suppliers.

Current research appears to fail in measuring the extent to which employee engagement is related to TQM practices to reduce cost of poor quality. There is still a void in academia and in practice about the effect of employee engagement, which is an element of Organisational Behavior on the performance of the supply chain, which is an element of Operations Management. There is a need to establish how the human-related issues can be translated into measurable business results, and also on the impact of these human variables on the management of the value chain.

The research objectives of the study are outlined below.

1.4 OBJECTIVES

The research objectives are divided into primary and secondary objectives.

1.4.1 Primary Objective

The primary objective of this study is to investigate employee engagement and the possible impact it has on the performance of the whole supply chain.

1.4.2 Secondary Objectives

To achieve the primary objective, the following secondary objectives include a need:

- To conceptualise employee engagement and TQM by conducting a literature study.
- To empirically assess the outcomes of employee engagement using the *Utrecht Work Engagement Scale* (UWES) questionnaire.
- To empirically assess the performance of the supply chain using TQM questionnaires.
- To determine the factor structures and internal consistencies of the UWES and TQM questionnaires within the petrochemical industry.
- To determine the relationship between the dimensions of engagement and TQM.
- To determine the demographic differences in terms of age, gender, race, duration of employment and qualification of employee engagement.
- To make recommendations for future research and practice.

The scope of the study is briefly outlined below.

1.5 SCOPE OF THE STUDY

The study involves principles of both Organisational Behaviour and Operations Management. It will primarily focus on a petrochemical company in South Africa with its unique challenges that are significant.

The research method used for the study is briefly discussed below.

1.6 RESEARCH METHODOLOGY

This section outlines the methodology that will be used to conduct this research which consists of two phases; namely a literature review and an empirical study. A review of the research design and research instrument to be used will also be outlined. Issues of data collection and analysis in relation to this study will be provided.

1.6.1 Phase 1: Literature Review

The literature review of this study is conducted by means of a study of relevant scientific journals, articles, books and research documents.

The following databases are considered:

- SACat: National catalogue of books and journals in South Africa
- Nexus: Databases compiled by the NRF of current and completed research in South Africa
- SAePublications: South African journals
- EbscoHost: International journals on Academic Search Premier, Business Source
- Premier, Communication and Mass Media Complete and EconLit
- Emerald: International journals
- ProQuest: International dissertations in full text
- Internet: Google Scholar
- SAMEDIA: Newspaper articles

A brief description of how the empirical study is carried out is discussed below.

1.6.2 Phase 2: Empirical Study

The empirical research used to achieve the objectives of this study is based on a descriptive research approach. This type of research is used when there is a clear statement of the research problem and detailed information needs (Malhotra, 2007:82). Cooper and Schindler (2008:151) indicate that such formalised studies are used to achieve research objectives that involve characteristics associated with a subject population, estimates of the proportions of a population that have these characteristics, and the discovery of associations amongst different variables. This type of research design was therefore identified as relevant to study the influence of employee engagement on the performance in a petrochemical industry.

Tustin *et al.,* (2005:86) indicate that the research methods used in this type of research design are structured and quantitative in nature. Quantitative research seeks to quantify data as compared to qualitative research that is unstructured, exploratory in nature and based on small samples from the population (Malhotra, 2007:143). Thus the quantitative research paradigm is based on positivism, therefore measuring social constructs objectively, with the aim of testing certain research objectives based on the statistical analyses of a set of theoretical variables. In contrast, the qualitative approach is holistic in nature and aims at understanding the deeper meaning that people attach to everyday life. This approach is subjective and makes use of inductive reasoning (Schurink & Schurink, 2001:4). Cameron and Price (2009:213) emphasize that quantitative data present significant practical advantages as it allows one to draw conclusions related to a wider group and data, in addition, it can be statistically analysed. In view of the above considerations, the quantitative approach was opted for as most suitable for the purposes of this dissertation.

1.6.3 Participants

The participants could be defined as an available sample of employees working in a petrochemical industry. A random sample of a population of employees working is targeted. The study population consists of the employees of the business unit within a petrochemical industry. Workers from all levels; ranging from professional to skilled, are included in the study population.

All the participants are briefed about the purpose of the study and why they are requested to participate. They are also assured that their identities will remain confidential. They are also informed that their participation is voluntary and that they are free to withdraw from the study if they so desire at any time. Thus the participants are free from any stress on account of their participation in the study.

1.6.4 Measuring Instruments

1.6.4.1 Validity and Reliability Defined

Reliability and validity are two key components to be considered when evaluating a particular instrument. Reliability, according to Bless and Higson-Smith (2000), is concerned with the consistency of the instrument, and an instrument is said to have high reliability if it can be trusted to give an accurate and consistent measurement of an unchanging value. The validity of an instrument, on the other hand, refers to how well an instrument measures the particular concept it is supposed to measure (Whitelaw, 2001:108). He argues that an instrument must be reliable before it can be valid, implying that the instrument must be consistently reproducible; and that once this has been achieved, the instrument can then be scrutinized to assess whether it is what it purports to be.

The reliability of the instruments is measured by the Cronbach alpha co-efficient which is based on the average correlation of variables within a test (Schmitt, 1996:350). If a construct yields a large alpha co-efficient, then it can be concluded that a large portion of the variance in the test results for the construct is attributable to general and group factors (Cortina, 1993:103). Schmitt (1996:351) suggests that the Cronbach alpha co-

efficient should be greater than 0.70, for the data to be regarded as reliable and internally consistent. Generally, alpha values above 0.70 are acceptable, although Field (2005:668) states that, when attitudes and not abilities are tested, a score of up to 0.6 could still be held as acceptable.

1.6.4.2 Instruments

Two standardised questionnaires are used in the empirical study. A biographical questionnaire; regarding participants' age, gender, race, education and years employed is also included in the measuring battery.

The first questionnaire is the *Utrecht Work Engagement Scale (UWES)* which is used to measure the levels of work engagement of the participants (Schaufeli, Salanova, González- Romá & Bakker, 2002). According to the authors, the UWES includes three dimensions, namely Vigour, Dedication and Absorption. The questionnaire consists of 17 questions and includes questions like "I am bursting with energy every day in my work"; "Time flies when I am at work" and "My job inspires me". The items of the questionnaire are scored on a frequency-rating scale, varying from 0 (never) to 6 (always). This questionnaire has been used previously in South Africa. Storm (2002) for example, obtained the following alpha coefficients for the UWES in a sample of 2396 members of the South African Police Service: Vigour: 0.78; Dedication: 0.89; and Absorption: 0.78.

The second questionnaire is based on *Total Quality Management (TQM)*. It was adopted from Zhang *et al*., (2000) based on variables which include top management commitment, employee involvement, continuous improvement, employee empowerment, customer focus and satisfaction. The instrument was tested and validated on 212 Chinese manufacturing companies. The overall values of Cronbach's alpha for independent variables were above 0.8, which means that the constructs were reliable to measure the non-financial performance. Employee involvement and empowerment are analysed to determine if the concept of TQM is embraced. In order for the company to meet customers' changing needs, it is important to have continuous improvement which is a pivotal aspect of TQM. Because there is no business without

customers, customer focus and satisfaction are also measured. A five-point Likert-scale is used as a measuring system throughout, with the following scores: *not satisfactory* (1), *somewhat satisfactory* (2), *unsure* (3), *satisfactory* (4) and *very satisfactory* (5).

The use of the interval scaling method enables the use of traditional statistical analyses methods which are discussed below.

1.6.5 Statistical Analysis

In this study the data is captured and analyzed using the SPSS and STATISTICA statistical programs (SPSS Inc, 2007; StatSoft, Inc, 2006), with the assistance of the Statistical Consulting Services of the North-West University.

Exploratory factor analysis is used to examine constructed equivalence and to enhance the reliability results of both the UWES and the TQM. The number of factors in the total sample of the UWES and TQM is determined by the principal component analysis. Subsequently components extraction is used to estimate the number of factors followed by principal axis factoring extraction using a rotation method of direct Oblimin with Kaiser normalisation and/or Varimax on the UWES and TQM. Descriptive statistics (e.g. means and standard deviations) are used to analyse data. Cronbach alpha co-efficients are used to determine the internal consistency of both instruments (the UWES and TQM).

Pearson product-moment correlation co-efficients are used to specify the relationship between the variables. In terms of statistical significance, the correlation is practically significant at ($p \leq 0.05$). Effect sizes (Cohen, 1988:15) are used to decide on the practical significance of the findings. A cut-off point of 0.30 (medium effect) and 0.50 for (large effect) are set for practical significance of correlation co-efficients.

T-tests and ANOVA were employed to determine differences between the groups in the sample. Effect size (Cohen, 1988:15; Steyn, 1999:12) was used in addition to statistical significance to determine the importance of relationships. Effect sizes served to indicate whether the results obtained were practically significant.

1.7 VALUE-ADDED AND LIMITATIONS OF THE STUDY

This study's contribution will be to show what the degree (extent) of employee engagement is, and the possible link between engagement and the impact it has on the performance of the supply chain of the company. This type of study has never been conducted within this particular environment, and as such a valuable contribution could be made to more effective performance management within this context.

The use of questionnaires in the present research constitutes a limitation. At best, these relationships could only be analyzed and described, not causality established. Therefore, the establishment of relationships in the present study serves only to set-up certain patterns which can be compared with previous theoretical research regarding the chronological relationships of the different variables being studied.

Another limitation is that the study is done using a sample of employees working for one petrochemical industry and might not represent the petrochemical industry as a whole.

The layout of the whole study is summarized below.

1.8 LAYOUT OF THE STUDY

This study is divided into five chapters:

- **Chapter one** introduced the *content* of the paper and explained why the topic was chosen for the research. The chapter presented the *problem statement, the research goals, methods* and *research limitations*
- **Chapter two** *conceptualizes* employee engagement and its effect on the performance of the supply chain from the literature
- **Chapter three** reports the *research method* that will be employed to achieve the goals of the research project. Aspects that will be covered include research design, measuring instruments that will be used to gather data and then data analyses techniques will be discussed.
- **Chapter four** focuses on *the results of the study.* The results will then be discussed by focusing on the implications of the findings for managers.

- **Chapter five** discusses *the conclusion* reached resulting from the study as well as any *recommendations* that can be made to management and recommendations for future studies.

1.9 CHAPTER SUMMARY

Chapter one provided the background and motivation including the problem statement, primary and secondary objectives, scope, research methodology to be utilized, limitations and layout of the study.

Chapter two will cover the literature relevant to this study.

CHAPTER 2: THEORETICAL OVERVIEW

2.1 INTRODUCTION

The purpose of the literature review is to examine key concepts and related research relevant to employee engagement and its effect on the performance of the supply chain. The following topics are identified as important: defining employee engagement and its importance, its antecedents and consequences as well as instruments used for measuring it. The supply chain and the use of quality as a non-financial measure of its performance are also reviewed. The concept of total quality management and its importance are discussed. Each of these topics is reviewed and critiqued relevant to the study.

2.2 EMPLOYEE ENGAGEMENT

Employee engagement is at the core of this research project; therefore, it is critical to explore it thoroughly. There are sub-topics that are key concepts relevant to employee engagement in this research. The first sub-topic addresses interpretations and definitions of employee engagement. The second sub-topic explores different categories of engagement. The third sub-topic addresses the antecedents and the consequences of employee engagement. Fourthly, the instruments used for measuring employee engagement are reviewed. Each element is reviewed in an effort to better understand what employee engagement is, the importance of it, and how and why employees become engaged.

2.2.1 Definition of Employee Engagement

It became evident from literature that employee engagement is defined differently by various organisations and authors. These definitions are in most cases adapted to what the organisations deem important for them.

Vance (2006:2) explains that there are common themes that emerge. Some of these themes include employees' satisfaction with their work and being proud of their employer. It includes the extent to which people enjoy and believe in what they do. It also relates to the perception that their employer values what they could offer the organisation. Stockley (2007) defines engagement as the extent that an employee believes in the mission, purpose, and values of an organisation, and demonstrates that commitment through their actions as an employee and their attitude towards the employer and customers. Most often it has been defined as emotional and intellectual commitment to the organisation (Baumruk, 2004:48; Richman, 2006:37), or the amount of discretionary effort exhibited by employees in their jobs (Frank *et al*., 2004:12).

Gibson (2006) defines employee engagement as "a heightened emotional connection that an employee feels for his or her organisation, that influences him or her to exert greater discretionary effort to his or her work" (as cited by Khan, 2007:694). Gallup Consulting (2008:11) describes employee engagement as "the extent to which employees are psychologically connected to something or someone in the organisation".

Yet another prominent researcher defines personal engagement as "the harnessing of the organisation's members' full selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances" (Kahn, 1990:694). Personal disengagement refers to "the uncoupling of selves from work roles; in disengagement, people withdraw and defend themselves physically, cognitively, or emotionally during role performances". Thus, according to Kahn (1990:693), engagement means to be psychologically present when occupying and performing an organisational role.

Rothbard (2001:656) also defines engagement as psychological presence, but goes further to state that it involves two critical components: attention and absorption. Attention refers to "cognitive availability and the amount of time one spends thinking about a role", while absorption "means being engrossed in a role and refers to the intensity of one's focus on a role."

Burnout researchers define engagement as the opposite or positive antithesis of burnout (Maslach *et al*., 2001:398). According to Maslach *et al*. (2001:399), engagement is characterized by energy, involvement, and efficacy, the direct opposite of the three burnout dimensions of exhaustion, cynicism, and inefficacy. Research on burnout and engagement has found that the core dimensions of burnout (exhaustion and cynicism) and engagement (vigour and dedication) are opposites of each other (Gonzalez-Roma *et al*., 2006:166). Schaufeli *et al*. (2002:74) define engagement "as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption." They further state that engagement is not a momentary and specific state, but rather, it is "a more persistent and pervasive affected cognitive state that is not focussed on any particular object, event, individual, or behavior".

In academic literature, engagement is said to be related to, but distinct from, other constructs in organisational behavior.

Organisational commitment differs from engagement in that it refers to a person's attitude and attachment towards their organisation. Engagement is not an attitude; it is the degree to which an individual is attentive and absorbed in the performance of their roles (Saks, 2006). And while organisational citizenship behavior involves voluntary and informal behaviors that can help co-workers and the organisation, the focus of engagement is one's formal role performance, rather than extra-role and voluntary behavior.

Engagement also differs from job involvement. According to May *et al*. (2004:12), job involvement is the result of a cognitive judgment about the need satisfying abilities of the job and is tied to one's self-image. Engagement has to do with how individuals employ themselves in the performance of their job. Furthermore, engagement involves the active use of emotions and behaviors in addition to cognition. May *et al*. (2004:12) also suggest that "engagement may be thought of as an antecedent to job involvement in that individuals who experience deep engagement in their roles should come to identify with their jobs."

In summary, although the definition and meaning of engagement in the practitioner literature often overlaps with other constructs, in the academic literature it has been

defined as a distinct and unique construct that consists of cognitive, emotional, and behavioral components that are associated with individual role performance. Furthermore, engagement is distinguishable from several related constructs, most notably organisational commitment, organisational citizenship behavior and job involvement.

2.2.2 Categories of Employee Engagement

According to the Gallup Consulting Organisation (The Gallup Organisation, 2004), there are, in terms of engagement, different types of people: Engaged, not engaged and actively disengaged.

- **Engaged**

"Engaged" employees are builders. They are more committed to the organisation. They are naturally curious about their company and their place in it. They perform at consistently high levels. They want to use their talents and strengths at work every day. They work with passion and they drive innovation and move their organisation forward. They are less likely to leave the organisation.

- **Not Engaged**

Not-engaged employees tend to concentrate on tasks rather than the goals and outcomes they are expected to accomplish. They want to be told what to do just so they can do it and say they have finished. They focus on accomplishing tasks versus achieving an outcome. Employees who are not-engaged tend to feel their contributions are being overlooked, and the company is not harnessing their potential. They often feel this way because they do not have productive relationships with their managers or with their co-workers.

- **Actively Dis-engaged**

The "actively dis-engaged" employees are the "cave-dwellers." They are "consistently against virtually everything." They are not just unhappy at work; they are busy acting out their unhappiness .They sow seeds of negativity at every opportunity. Every day,

actively dis-engaged workers undermine what their engaged co-workers accomplish. As workers increasingly rely on each other to generate products and services, the problems and tensions that are fostered by actively dis-engaged workers can cause great damage to an organisation's functioning. They increase the cost of the organisation by low quality, customer dis-satisfaction, and missed opportunities.

2.2.3 Antecedents and consequences of engagement

In recent years, more studies have begun to look at the antecedents and consequences of employee engagement. It is understandable that organisations wish to increase employee engagement, given that engaged employees are willing to make use of their full potential in their work roles in a positive way (Kahn, 1990:694), have better well-being (Hallberg & Schaufeli, 2006:120), are more productive and remain in their jobs for longer (Saks, 2006:602; Schaufeli & Bakker, 2004:293).

Many researchers have tried to identify factors leading to employee engagement and developed models to draw implications for managers. Their diagnosis aims to determine the drivers that will increase employee engagement level.

Kahn (1990:694) proposed three antecedent conditions of psychological meaningfulness, availability and safety which provide opportunities for intervention to increase levels of engagement. Psychological meaningfulness is influenced by work characteristics, such as challenge and autonomy (Bakker & Demerouti, 2007:310). Psychological availability depends on individuals having sufficient psychological and physical resources, such as self-confidence, to invest in their role performances (Hallberg & Schaufeli, 2006:121). Psychological safety stems from organisational social systems, with consistent and supportive co-worker interactions and organisational norms, allowing for greater engagement (Bakker & Xanthopoulou, 2009:157). This third antecedent condition, psychological safety, offers the most potential for leadership to influence engagement. Specifically, leadership that provides a supportive, trusting environment allows employees to fully invest their energies into their work roles. Kahn

(1990:694) established theoretical and initial empirical evidence for a link between supportive leadership and employee engagement.

According to the Penna research report (2007), “meaning” at work has the potential to be a valuable way of bringing employers and employees closer together, to the benefit of both, where employees experience a sense of community, the space to be themselves and the opportunity to make a contribution. . Employees want to work in the organisations in which they find meaning in what they do. Penna (2007) researchers have also come up with a new model they called “Hierarchy of engagement” which resembles Maslow’s “Hierarchy of needs” model.

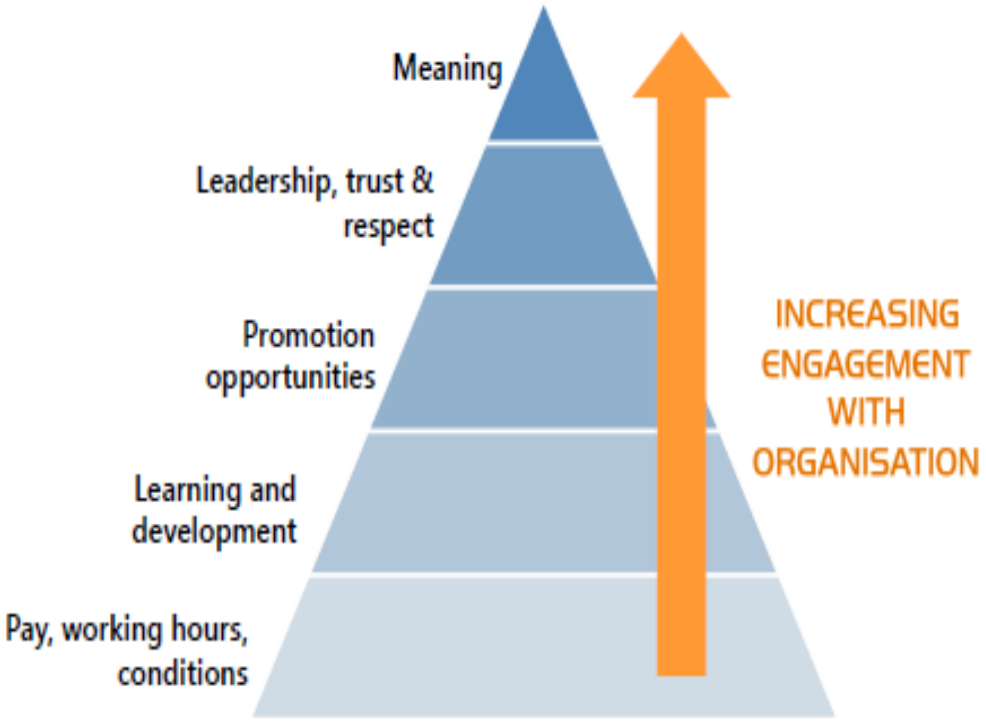

Figure 1: Penna's Hierarchy of Engagement (2007)

In the bottom line there are basic needs of pay and benefits. Once these needs of the employee are satisfied, then the employee looks to development opportunities, the possibility for promotion and then leadership style will be introduced into the mix in the model. Finally, when all the above cited lower level aspirations have been satisfied, the

employee looks to an alignment of value and meaning, which is displayed by a true sense of connection, a common purpose and a shared sense of meaning at work.

The Blessing White (2008) study has found that almost 60% of the surveyed employees want more opportunities to grow forward to remain satisfied in their jobs. Strong manager-employee relationship is a crucial ingredient in the employee engagement and retention formula.

Development Dimensions International (DDI, 2005) states that a manager must do five things to create a highly engaged workforce. They are:

- Align efforts with strategy
- Empower
- Promote and encourage teamwork and collaboration
- Help people grow and develop
- Provide support and recognition where appropriate

Perrin (2003:8) identifies the top ten work place attributes which will result in employee engagement. The top three among the ten drivers listed by Perrin are:

- Senior management's interest in employees' well-being
- Challenging work
- Decision making authority.

After surveying 10,000 NHS employees in Great Britain, Institute of Employment Studies (Robinson *et al*., 2004) points out that the key driver of employee engagement is a sense of feeling valued and involved, which has the components such as involvement in decision making, the extent to which employees feel able to voice their ideas, the opportunities employees have to develop their jobs and the extent to which the organisation is concerned for employees' health and well-being.

CIPD (2006) on the basis of its survey of 2000 employees from across Great Britain indicates that communication is the top priority to lead employees to engagement. The report singles out having the opportunity to feed their views and opinions upwards as the most important driver of people's engagement. The report also identifies the importance of being kept informed about what is going on in the organisation. The oldest consulting organisation in conducting engagement surveys, Gallup, has found that the manager is the key to an engaged work force. James Clifton, CEO of the Gallup Organisation, indicates that employees who have close friendships at work are more engaged workers (Clifton, 2008). Vance (2006) explains the fact that employee engagement is inextricably linked with employer practices. To shed light on the ways in which employer practices affect job performance and engagement, he presents a job performance model. According to him, employee engagement is the outcome of personal attributes such as knowledge, skills, abilities, temperament, attitudes and personality, organisational context which includes leadership, physical setting and social setting and HR practices that directly affect the person, process and context components of job performance. The following list of eight commonly cited drivers of employee engagement is adapted from Khan (2007):

- Trust and integrity: How well do managers communicate and follow through?
- Nature of the job: Is it mentally stimulating?
- Alignment between employee performance and company performance: Do employees understand how their work contributes to the company's performance?
- Career growth opportunities: Are there opportunities for growth?
- Pride in the company: Do employees gain self-esteem from being associated with their company?
- Co-workers or team members: Do they influence employees' level of engagement?
- Employee development: Is the company developing the employee's skills?
- Relationship with the person's manager: Do employees value their relationships with their managers?

Practitioners and academics tend to agree that the consequences of employee engagement are positive (Saks, 2006:603). There is a general belief that there is a connection between employee engagement and business results; a meta-analysis conducted by Harter *et al*. (2002:272) confirms this connection. They concluded that, "…employee satisfaction and engagement are related to meaningful business outcomes at a magnitude that is important to many organisations". However, engagement is an individual-level construct and if it does lead to business results, it must first impact individual-level outcomes. Therefore, there is reason to expect employee engagement to be related to individuals' attitudes, intentions, and behaviours. Although neither Kahn (1990:693) nor May *et al.* (2004:12) included outcomes in their studies, Kahn (1992:322) proposed that high levels of engagement lead to both positive outcomes for individuals, (e.g. quality of people's work and their own experiences of doing that work), as well as positive organisational-level outcomes (e.g. the growth and productivity of organisations).

The Gallup Organisation (2004) found critical links between employee engagement, customer loyalty, business growth and profitability. They compared the scores of these variables among a sample of stores scoring in the top 25 percent on employee engagement and customer loyalty with those in the bottom 25 percent. Stores in the bottom 25 percent significantly under-performed across three productivity measures: sales, customer complaints and turnover. Gallup cites numerous similar examples. The International Survey Research (ISR) team has similarly found encouraging evidence that organisations can only reach their full potential through emotionally engaging employees and customers (ISR, 2004).

In an extension of the Gallup findings, Ott (2007) cites Gallup research, which found that higher workplace engagement predicts higher earnings per share (EPS) among publicly-traded businesses. When compared with industry competitors at the company level, organisations with more than four engaged employees for every one actively dis-engaged, experienced 2.6 times more growth in EPS than did organisations with a ratio of slightly less than one engaged worker for every one actively dis-engaged employee. The findings can be considered as reliable as the variability in differing industries was controlled by comparing each company to its competition, and the patterns across time

for EPS were explored due to a ‘bouncing’ increase or decrease which is common in EPS (Ott, 2007).

Whilst this research does not show investors and business leaders exactly what organisations are doing on a day-to-day basis to develop engaged employees, the findings do demonstrate differences in overall performance between companies, and Gallup’s meta-analyses present strong evidence that highly engaged work groups within companies out-perform groups with lower employee engagement levels, and the recent findings re-inforce these conclusions at the workgroup level. The meta-analysis study shows that top-quartile business units have 12 percent higher customer advocacy, 18 percent higher productivity, and 12 percent higher profitability than bottom-quartile business units. In contrast, bottom-quartile business units experience 31 percent to 51 percent more employee turnover than those in the top quartile of workplace engagement. This research into EPS provides a degree of proof that employee engagement correlates to crucial business outcomes.

Shaffer (2004:22) reports that engagement efforts have resulted in a 76 percent decline in work-related accidents. This was achieved by communicating to employees how they can make a difference and providing them with the resources to do their jobs.

Vance (2006) reports that organisations with engaged employees were five times less likely to have a safety incident than those who have non-engaged employees. An engaged workforce is also seven times less likely to have a lost-time safety incident. Engaged employees understand how their safety actions influences the overall success of the business.

2.2.4 Measuring Employee Engagement

There are several instruments that can be used to assess work engagement. Those who follow Maslach and Leiter’s (1997, 2008:499) approach can use the MBI (Maslach *et a*l., 1996) to assess energy (low score on exhaustion), involvement (low score on cynicism), and professional efficacy (high score on efficacy).

An alternative instrument for the assessment of employee engagement is the Oldenburg Burnout Inventory (OLBI) (Demerouti & Bakker, 2008; Demerouti, Bakker, Nachreiner, & Ebbinghaus, 2002). This instrument was developed originally to assess burnout, but includes both positively and negatively phrased items, and hence it can be used to assess work engagement as well (Gonza´lez-Roma *et al.*, 2006:166). Researchers interested in assessing work engagement with the OLBI may recode the negatively framed items. The OLBI includes two dimensions: one ranging from exhaustion to vigour and a second ranging from cynicism (dis-engagement) to dedication. The reliability and factorial validity of the OLBI has been confirmed in studies conducted in Germany, Greece, the Netherlands, the USA, and South Africa (Demerouti & Bakker, 2008). Results of these studies clearly showed that a two-factor structure with vigour and dedication (referred to as exhaustion and dis-engagement in several of these studies) as the underlying factors fitted better to the data of several occupational groups than alternative factor structures.

The most often used instrument to measure engagement is the Utrecht Work Engagement Scale (UWES) (Schaufeli, Salanova, González- Romá & Bakker, 2002:72) that includes three sub-scales: vigour, dedication, and absorption. The UWES has been validated in several countries, including China (Yi-Wen & Yi-Qun, 2005:269), Japan (Shimazu *et al*., 2008:511), South Africa (Storm & Rothmann, 2003:62), and the Netherlands (Schaufeli & Bakker, 2003). All investigations used confirmatory factor analyses and showed that the fit of the hypothesized three-factor structure to the data was superior to that of alternative factor models. In addition, the internal consistencies of the three subscales proved to be sufficient in each study.

2.2.5 Employee Engagement in Context

It is worth considering how employee engagement levels vary across occupations, industries and globally. Much of the available international evidence comes from Gallup, which has conducted Employee Engagement Index surveys in many countries.

Evidence from the USA (Johnson, 2004:4) indicates roughly half of all Americans in the workforce are not fully engaged or they are disengaged. Furthermore, a Global

Workforce Survey conducted in 2005 by consultancy firm Towers Perrin found disconcerting findings, again in the USA (Seijts & Crim, 2006:1). The survey involved about 85,000 people who worked full-time for large and mid-sized firms; it found only 14 per cent of all employees worldwide were highly engaged in their job. The survey also indicated that on a country-by-country basis, the percentages of highly engaged, moderately engaged, and actively dis-engaged employees varied considerably. Moreover, the results showed some interesting, perhaps counter-intuitive, findings. For example, Mexico and Brazil have the highest percentages of engaged employees, while Japan and Italy have the largest percentages of dis-engaged employees.

A useful comparison between a range of demographic segments, from job level (senior executive, director/manager, supervisor/foreman, specialist/professional, non management salaried and non-management hourly) to industry category (non-profit, high tech, heavy manufacturing, insurance, pharmaceuticals, hospital and finance/banking) was carried out by Perrin (2003), who found a pattern across the segments. Each group had only a small group of highly engaged respondents, a slightly larger dis-engaged group, with the majority in the 'moderately engaged group'.

Across industries, engagement is substantially higher in the non-profit sector than in every other sector looked at by Perrin (2003). This would appear logical, given that people tend to be drawn to this sector through a sense of mission, rather than from any prospect of high pay or wealth accumulation. This finding is also consistent with the numerous definitions and views surrounding engagement, which identifies a 'passion for work' as being a key component factor (Truss *et al.*, 2006; Brim, 2002 and Holbeche & Springett, 2003). Indeed, the fact that the sector is traditionally not a high-paying one, relative to the others studied, emphasises the fact that it is not possible to 'buy' engagement in the conventional sense by offering better than average monetary awards. Conversely, in another study comparing the public and private sectors, Truss *et al*. (2006) found that groups in the public sector had a more negative experience of work, they reported more bullying and harassment than those in the private sector, and were less satisfied with the opportunities they had to use their abilities.

Kock (2010) from The Human Resource Practice conducted a research into employee engagement in South Africa. His research highlighted that employees in South Africa are more engaged than their global counterparts. In South Africa, 76% of 767 respondents were fully engaged, 13% were undecided and 11% were disengaged.

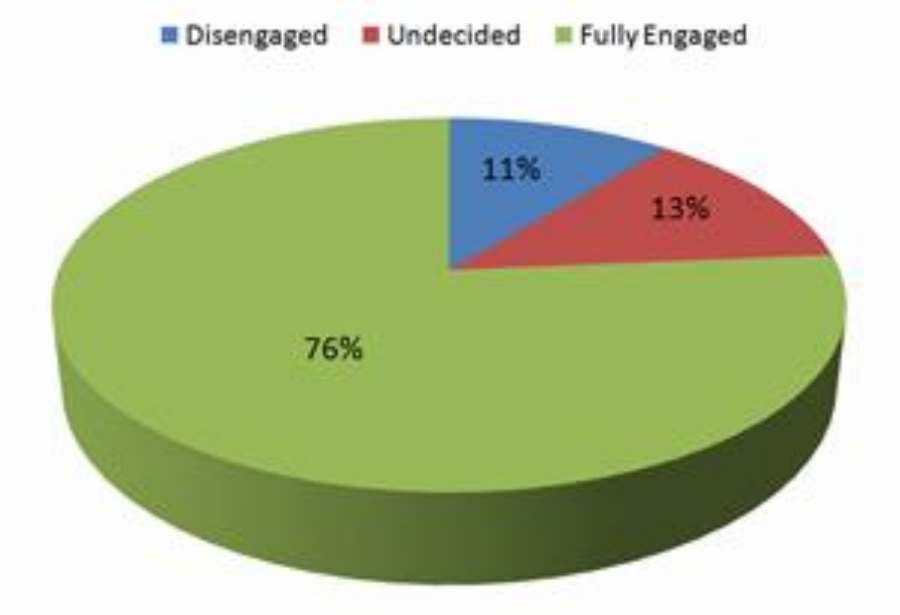

Figure 2: Overall employee engagement levels in South Africa – Kock (2010)

Kock (2010) also found that there were differences in “intention to stay” depending on how people viewed their current career status. The research showed that just under half (47 percent) of the respondents stated they were ready for a new job at a new level and 17 percent said they were ready for a new job at the same level. Those who perceived themselves to be “growing in their current job” had the highest intention to stay and those who perceived themselves to "need a bigger job at a new level" had the lowest intention to stay.

In addition, African participants showed lower intention to stay than White respondents regardless of career status. Younger participants showed less intention to stay regardless of career status. “Intention to stay” seemed, therefore, to be significantly influenced by perceptions of career status, racial group and age.

2.3 SUPPLY CHAIN PERFORMANCE

Business organisations need to capitalize on Supply Chain (SC) capabilities and resources to bring products and services to the market faster, at the lowest possible cost, with the appropriate product and service features and the best overall value (Gunasekaran *et al*., 2001:71). Performance measures are important to the effectiveness of SC. Supply Chain Performance Measures (SCPM) serve as an indicator of how well the SC system is functioning. Measuring SC performance can facilitate a greater understanding of the SC and improve its overall performance (Charan *et al*., 2008:512).

2.3.1 Supply Chain Management

The broader definition of supply chain management (SCM) determined by the Global Supply Chain Forum is generally accepted as a norm (Cooper *et al*., 1997:2, Lambert *et al*., 1998:2):

"Supply Chain Management (SCM) is the integration of key business processes from end user through original suppliers that provides products, services, and information that adds value for customers and other stakeholders"

Supply Chain Management (SCM) is the design of the firm's customer relationship, order fulfillment and supplier relationship processes and the synchronization of these processes of its suppliers and customers in order to match the flow of services, materials and information with customer demand. The purpose of SCM is to design the Supply Chain (SC) and to synchronize the key processes of the firm's suppliers and customers, so as to match the flow of services, materials and information with customer demand (Krajewski *et al*., 2007).

The term SC is used to describe the flow of goods from the very first process encountered in the production of a product right through to the final sale to the end consumer. SCM can be used to describe a number of concepts in the processes inside a manufacturing organisation; purchasing and supply management occurring within

dyadic relationships; the total chain; and finally, a total firm network. (Bruce *et al*., 2004:151)

A good working definition of an SC is that described by Stevens (Stevens, 1989:3):

"A system whose constituent parts include material suppliers, production facilities, distribution services and customers linked together via the feed forward flow of materials and the feedback flow of information".

Supply Chain Operations Reference model (SCOR) which was defined in the Supply Chain Council (2005), defined an SC as follows (Supply Chain Council, 2005):

"The supply chain encompasses every effort involved in producing and delivering a final product, from the supplier's supplier to the customer's customer. Five basic processes– plan, source, make, deliver and return – broadly define these efforts, which include managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer."

Supply Chain Council (2005) defined that there are four basic processes in the SC: plan, source, delivery and return. Plan refers to processes that balance aggregate demand and delivery requirements. Sources are processes that transform a product to a finished state to meet planned or actual demand. Delivery is a process in which the finished goods are delivered to a customer. Return is defined as processes associated with returning or receiving returned products. (Iskanius, 2006; Supply Chain Council, 2005)

Management of supply chains is called Supply Chain Management. SCM is a substantially more extensive concept than logistics. SCM is defined as management of upstream and downstream business relationships together with suppliers and customers. SCM aims at producing large customer value with smaller total costs for the whole SC. (Christopher, 1998) SCM encompasses co-operation of various functions between suppliers and customers. Most essential divisions of SCM are those of managing business relations and managing customers.

2.3.2 Supply Chain Performance Measurement

Sambasivan (2009:347) defines measure as a more objective or concrete attribute that is observed and measured and metric as an abstract, higher-level latent attribute that can have many measures. Because SC is a network of firms that includes material suppliers, production facilities, distribution services and customers linked together via the flow of materials, information and funds (Gunasekaran *et al*., 2001:71), the measures have been classified as follows: funds flow (cost and profitability), internal process flow (production level flexibility, order fulfilment and quality), material flow (inventory and internal time performance), sales and services flow (delivery performance, customer responsiveness and customer satisfaction), information flow and partner relationship process flow (supplier evaluation and sharing of information with suppliers and customers).

According to Beamon (1999:275), a supply chain measurement system must place emphasis on three separate types of performance measures: Resource measures (generally costs); Output measures (generally customer responsiveness); and Flexibility measures (Ability to respond to a changing environment). Each of these three types of performance measures has different goals and purpose. Resource measures include: inventory levels, personnel requirements, equipment utilization, energy usage, and cost. Output measures include: customer responsiveness, quality, and the quantity of final product produced. Flexibility measures are a system's ability to accommodate volume and schedule fluctuations from suppliers, manufacturers, and customers (Beamon, 1999).

Many authors have classified performance measuring system (PMS) in different ways. A basic classification offered by Cagnazzo *et al*. (2010:164) consists of grouping PMS models into: Balanced models; Quality models; Questionnaire-based models; Hierarchical models; and Support models.

Balanced Model: Balanced models consider the presence of both financial and non-financial indicators. In these models several separate performance measures which correspond to diverse perspectives (financial, customer, etc.) are considered

independently. Some of the important existing models are Performance Measurement Matrix; Balanced Scorecard (BSC); and Performance Prism.

Quality Models: These are frameworks in which a great deal of importance is attributed to Quality. An example of quality model is the Business Excellence Model (EFQM-Model) (EFQM, 1999).

Questionnaire-based Models: These are frameworks based on questionnaires. The Performance Measurement Questionnaire (PMQ) and TOPP System (a research program studying productivity issues in Norwegian manufacturing industry) (Rolstadås, 1998:991) are examples.

Hierarchical Models: SCPM models that are strictly hierarchical (or strictly vertical), characterised by cost and non-cost performance on different levels of aggregation are classified as hierarchical models. Frameworks where there is a clear hierarchy of indicators are: Performance Pyramid; Advanced Manufacturing Business Implementation Tool for Europe (AMBITE); The European Network for Advanced Performance Study (ENAPS) approach; and Integrated Dynamic Performance Measurement System (IDPMS).

Support Models: Frameworks that do not build a performance measurement system but help in the identification of the factors that influence performance indicators are classified as support models. These models are: Quantitative Model for Performance Measurement System (QMPMS); and Model for Predictive Performance Measurement System (MPPMS) (Cagnazzo *et al*., 2010:164).

The focus of this study will be on quality as a non-financial measure of performance.

2.3.3 Quality

There is much published work on quality as a performance measure in supply chains Beamon (1999:275).

Quality is most often defined as the ability of a product or service to consistently meet or exceed customer expectations. Lillrank (2002:691) classifies quality definitions found in

the literature to be divided into four categories: excellence, value for money, conformity to requirements and meeting or exceeding customer requirements. Lillrank further emphasises that excellence-based definitions include the idea that products or services may include elements that are perceived as superior, which are often very subjective, hard to measure and confuse quality with product segments or grades. The most widely used definitions from the American Society for Quality and more recently ISO 9000 - 2000, are based on customer satisfaction, which may be achieved not only through conformance to requirements but through some inherent characteristics of the product or service, and the way it is presented and delivered to the customers (Barnes, 2009).

Bendell *et al*. (1995:44) argue that the importance of quality as an objective is now widely recognised throughout the world. As a result of increasing customer demands and the removal of barriers of trade, inefficient suppliers or suppliers of low quality goods or services will find it difficult to survive. According to Stevenson (2002:403), the degree to which a product or service successfully satisfies its intended purpose has four determinants, which are listed below:

- Design;
- How well it conforms to the design;
- Ease of use; and
- Service after delivery.

According to Peters (1999:6), quality management originated from two ideas about how to run organisations better. The first idea revolved around customers. If companies could determine what its customers like, they could deliver it the same way every time. Customers will come back to purchase such products and services, and will also tell others about these products and services. The second idea that companies need to explore is efficiency. If companies can figure out the most efficient way to produce a product or service and stop wasting time, materials, replacing poor quality goods or delivering unsatisfactory service, that company will be more successful.

2.3.4 Total Quality Management

Total quality management (TQM) as defined by Mohrman *et al*. (1995:26) is an approach to managing organisations, which emphasises the continuous improvement of quality and customer satisfaction. It entails the application of systematic tools and approaches for managing organisational processes with these ends in mind (continuous improvement of quality and customer satisfaction), and involves the establishment of structures such as quality improvement teams for maintaining focus and enacting organisational improvement processes.

Lau and Tang (2009:410) define TQM as the management philosophy and company practices that aim to harness the human and material resources of an organisation in the most effective way to achieve the objectives of the organisation. TQM is further explained as a management-led process to obtain the involvement of all employees, in the continuous improvement of the performance of all activities, as part of the normal business to meet the needs and satisfaction of both the internal and external customers. Anjard (1998:238) further explains TQM as a visionary, cultural movement which represents recognition of a management philosophy that encourages employees to share responsibility for delivering quality services and products. Lau and Anderson (1997:85) explain what each abbreviated letter in TQM means as follows:

- The T-component of TQM: TQM implies a total, company-wide commitment to quality and calls for everyone, including suppliers, to be responsible for quality and involved in all the efforts to maintain or upgrade their work.
- The Q-component of TQM: The major goal of quality management is to meet and exceed customer expectations. Internal customers are as important as external customers. Continuous improvement should be integrated into the management of all systems and processes. Effective training should also teach and empower all employees to understand and solve quality related problems.
- The M-component of TQM: The broad nature of TQM efforts requires commitment of top management to the process. Top management is responsible for creating clear and visible values and to integrate these values into strategic business plans. TQM

requires that all employees are to be involved and as a result it is important to re-shape the organisational culture that supports it.

Karia and Asaari (2006:30) define TQM practices (what an organisation does to demonstrate its commitment to TQM) as a set of practical measures such as:

- continuous improvement;
- meeting customer requirements;
- reducing re-work;
- long-range thinking;
- increased employee involvement and teamwork;
- process re-design , competitive benchmarking;
- team-based problem solving;
- continuous monitoring of results; and
- closer relationship with suppliers.

The above involves the combined efforts of all members of the organisation – from senior management to shop-floor employees. Mohrman et al. (1995:26) emphasise that the key to TQM is the definition of quality as meeting customer requirements, and a belief that the organisational capability to deliver quality is enhanced by continuously improving the capacity of the work processes of the organisation to deliver value to customers.

TQM has been widely implemented throughout the world. Many firms have arrived at the conclusion that effective TQM implementation can improve their competitive abilities and provide strategic advantages in the marketplace (Anderson & Sedatole, 1998:214). Several studies have shown that the adoption of TQM practices enable firms to compete globally (Allen & Kilimann 2001:110). Total quality has developed to what it is today along with other business management philosophies. It is a diversified way to see the growth of the whole business. TQM posits certain numerical and non -numerical goals for a company. Reaching these goals is typically not easy. It requires support from

management, long-term strategic decision-making and motivated personnel (Garvin, 1988:319).

In general, product or service quality measures are essential to find out information that is really important to customers about each product or service. This information can help to drive the new product design process, which fit the customers' requirements (Brown, 1996:84). Moreover, measuring product and service quality is identifying information on what customers want as well as what dimensions of products or services need to be measured and controlled.

2.4 CHAPTER SUMMARY

This chapter set out to review the evidence regarding the impact of employee engagement. It began by looking at the general sentiment throughout the literature and concluded that there is an over-riding belief in the literature that employee engagement has measurable and significant effects on the organisation's success, e.g. the Gallup Organisation cited numerous examples of increased corporate profitability due to increased employee engagement. Engaged employees stay longer and contribute in a more meaningful way. A highly engaged workforce is the sign of a healthy organisation, whatever its size, geographical location and economic sector.

The concept of Quality as a measure of Supply Chain performance was also discussed. Current research does not fully show the extent to which employee engagement is related to TQM practices to reduce cost of poor quality. There is still a void in academia and in practice about the effect of employee engagement on the performance of the supply chain.

The next chapter presents the empirical research. The research methodology as well as the results from the empirical study is presented.

CHAPTER 3: EMPIRICAL RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the research method and design with a view to achieving the stated objectives of this research work. A thorough examination of the source of data, the methods used in data collection and data analysis is carried out.

3.2 RESEARCH APPROACH

Methodology focuses on how we gain knowledge about the world (Denzin & Lincoln, 1994:99). The research philosophy depends on the way one thinks about the development of knowledge. Two views in this regard dominate the literature, positivism and phenomenology (Saunders *et al.,* 2000:12). Positivism is an approach to social research that seeks to apply the social science model of research to investigations of social phenomena and explanations of the social world (Denscombe, 2002:18). If an individual's research philosophy reflects the principles of positivism, then they will probably adopt the philosophical stance of the natural scientist. They will prefer working with an observable social reality and the end product of such research can be law-like generalizations similar to those produced by the physical and natural scientist (Remenyi *et al*., 1998:73).

Phenomenology or interpretivism has come to provide an umbrella term for a range of approaches that reject some of the basic premises of positivism. This includes that social reality is subjective, that humans react to the knowledge that they are being studied, and that it is not possible to gain objective knowledge about social phenomena (Denscombe, 2002:18). Researchers who are critical of positivism argue that rich insights into this complex world will be lost if such complexity is reduced entirely to a series of law-like generalizations. The terms most commonly used to differentiate these paradigms with regard to their associated methods and techniques are quantitative and qualitative respectively (Creswell, 1994:43).

The quantitative or positivist approach is objective in nature and concentrates on measuring phenomenon. This involves collecting and analysing numerical data and applying statistical tests. The qualitative, phenomenological or interpretivist approach is more subjective in nature and involves examining and reflecting on perceptions in order to gain an understanding of social and human activities.

By quantitative methods, researchers mean the techniques of randomised experiments, quasi-experiments, paper and pencil "objective" tests, multivariate statistical analysis, sample surveys and the like. In contrast, qualitative methods include ethnography, case studies, in-depth interviews and participant observation (Cook & Reichardt, 1979:9). Quantitative research determines the quantity or extent of an outcome in numbers and hence provides an exact approach to measurement. Qualitative research is subjective in nature and leaves much of the measurement process to the discretion of the researcher. This approach does not use rigorous mathematical analysis (Zikmund, 2003:111). Hussey and Hussey (1997:54) compare the features of the two main research paradigms as follows:

Table 1: Features of the two main research paradigms

Positivism paradigm	**Phenomenological paradigm**
Tends to produce quantitative data	Tends to produce qualitative data
Uses large sample	Uses small samples
Concerned with hypothesis testing	Concerned with generating theories
Data is highly specific and precise	Data is rich and subjective
The location is artificial	The location is natural
Reliability is high	Reliability is low
Validity is low	Validity is high
Generalises from sample to Population	Generalises from one setting to another

(Hussey and Hussey, 1997)

In the case of current research, quantitative data is required in order to measure the level of employee engagement and determine its effect on the performance of the petrochemical industry. It is also necessary to test the selected hypotheses and to

generalise from the sample to the overall population in the company. Therefore the process of this research is primarily positivist or quantitative in that questionnaires are used for the individual research

3.3 RESEARCH DESIGN

Research design is defined as the plan and structure of investigation so conceived as to obtain answers to research questions (Blumberg *et al.*, 2008:195). The design also provides the overall framework for collecting the data. After the problem has been formulated concretely, the design is developed as a format for the detailed steps in the study (Leedy, 1997:94).

A survey design is used in this case. According to Kerlinger (1986:279) a survey design attempts to determine the incidence, distribution, and inter-relationships among sociological and psychological variables that focus on people, the vital factors concerning people, as well as their beliefs, opinions, attitudes, motivations and behaviour. Survey designs are also considered to be very accurate within sampling error. A survey design is also considered to be probably the best adapted to obtaining personal and social facts, beliefs, and attitudes (Kerlinger, 1986:25).

3.4 SAMPLE

Trochim (2000) describes a research population as a group that the researcher wants to generalise from and the sample as the group of people that are selected to be in the study. This was supported by Sekaran (2000:295) when he defined a sample as a sub-set of the population in question and comprises a selection of members from that particular population. The definition of the sample is of vital importance as the results of an investigation are not trustworthy more than the quality of the population or representation of the sample.

The targeted population for this study is the employees of the business unit (Sasol Wax) within a petrochemical industry (Sasol). Sasol Wax is one of the world's leading specialists in petroleum and synthetic waxes and related products. Its global operations

comprise several production and blending plants throughout Europe, South Africa, the USA, and China, and boasts of a few subsidiaries or joint ventures, legal entities and representatives based in various countries. The target sample is employees working in South African based production facilities which are in Sasolburg and Durban. The company has about 583 employees. Workers from all levels; ranging from professional to skilled, are included in the study population. Table 2 shows the characteristics of the target population as provided by the Human Resources Department of Sasol Wax. Random sampling is used to send the questionnaires to 200 employees. Leedy (1997:205) defines randomisation of the probability sample to mean selecting a sample from the whole population in such a way that the characteristics of each unit of the sample approximate the characteristics of the whole sample. Randomisation for this study is achieved by the researcher selecting, at random, employees from the total list. The selection is unbiased since team leaders and managers are not able to select respondents who they favour for the study.

Table 2: Characteristics of the target population of Sasol Wax

Item	Category	Frequency	Percentage
Total Employees		583	
Gender	Male	447	77
	Female	136	23
Race	African	257	44
	White	256	44
	Coloured	15	3
	Asian	55	9
Duration of Employment (years)	0 – 2	68	12
	3 – 5	170	29
	6 – 10	108	18
	> 10	237	41
Qualification	Certificate	110	18
	Matric	270	44
	Diploma / Degree	160	26
	Post-graduate	70	12

3.5 VALIDITY AND RELIABILITY

Validity and reliability are important factors to be considered during the data collection process (Leedy, 1997:32).

3.5.1 Validity in quantitative research

Validity describes the extent to which a measure accurately represents the concept it claims to measure (Punch, 1998:247). There are two broad measures of validity - external and internal. External validity addresses the ability to apply with confidence the findings of the study to other people and other situations, and ensures that the conditions under which the study is carried out are representative of the situations and time to which the results are to apply (Black, 1999:200). The sample of participants drawn from the population of interest must be representative of that population at the time of the study. Finally, representative samples should be drawn with reference to relevant variables in the study, such as gender and age. Internal validity addresses the reasons for the outcomes of the study, and helps to reduce other, often unanticipated, reasons for these outcomes (Black, 1999:200).

Three approaches to assessing internal validity are content validity, criterion-related validity, and construct validity (Eby, 1993:27; Punch, 1998:247).

Content validity is the weakest level of validity, and is concerned with the relevance and representation of items, such as individual questions in a questionnaire, to the intended setting. It is particularly important to measure this if the study is designed to ascertain respondents' knowledge within a specific field, or to measure personal attributes such as attitudes (Eby, 1993:27). It can be achieved through conducting a pilot study with people who are similar to the intended study participants. Such relevance can be supported by literature reviews and documentary evidence, where available.

Criterion-related validity is a stronger form of validity, established when a tool such as a questionnaire can be compared to other similar validated measures of the same concept or phenomenon (Eby, 1993:27). However, where no other measures exist, this will not be possible.

Construct validity involves demonstrating relationships between the concepts being studied and the construct or theory that is relevant to them. There are several ways of demonstrating construct validity, one of which is factor analysis.

Factor analysis refers to a number of statistical procedures used to determine characteristics that relate to each other (Bryman & Cramer, 2004). Factor analysis is particularly useful for examining the relationships between large numbers of variables, dis-entangling them and identifying clusters of variables that are closely linked together (Burns & Grove, 2005). The validity of the instruments used for the study is discussed below.

3.5.2 Reliability in quantitative research

Leedy (1997:35) defines reliability as the consistency with which a measuring instrument performs. Essentially, any research tool should provide the same information if used by different people (inter-rater reliability), or if it is used at different times, for example, on Friday morning and again on Sunday afternoon (test-retest reliability) (Cormack, 2000). The internal consistency of research tools needs to be assessed. Internal consistency is the relationship between all the results obtained from a single test or survey. Internal consistency of items such as individual questions in a questionnaire can be measured using statistical procedures such as Cronbach's alpha co-efficient (Cronbach, 1951:297), randomly splitting all the responses to a question into two sets, totaling the scores on the two sets, and working out the correlation between the two sets. This is known as a 'split-half' test. A more sophisticated way of doing this is to create all possible split halves and determine the average correlation between all of them. Cronbach's alpha (1951:297) is an estimate of the average of all split-half estimates of reliability.

Reliability is the proportion of variability in a measured score that is due to variability in the true score (rather than some kind of error). A reliability of 0.9 means 90 per cent of the variability in the observed score is true and 10 percent is due to error. A reliability of 80 to 90 percent is recommended for most research purposes.

Methods of estimating the reliability of measurements do have some limitations; for example, test-retest reliability is potentially flawed if respondents' previous experiences in the first testing influence responses in the second testing (Carmines & Zeller, 1979:48). Moreover, intervening events between the two administrations may account for differences between the two sets of results (Bryman & Cramer, 2004) and contribute to flaws in external validity (Robinson Kurpius & Stafford, 2005).
The reliability of the instruments used for the study is discussed below.

3.6 MEASURING INSTRUMENTS

A biographical questionnaire was developed to gather information about the demographical characteristics of the participants. Information to be gathered includes age, gender, race, education, and number of years employed.
Two standardized questionnaires are used in the empirical study. The questionnaires are shown in the Appendix.

3.6.1 The Utrecht Work Engagement Scale

The Utrecht Work Engagement Scale (UWES; Schaufeli, Salanova, Gonzilez-Romi & Bakker, 2002) is used to measure work engagement.
Arguing that employee engagement cannot be effectively measured by using the opposite scores of the Maslach Burnout Inventory (MBI), Schaufeli, Salanova *et al.* (2002) developed a self-report questionnaire (the UWES) to assess employee engagement. The UWES includes all three aspects of employee engagement, namely vigour, dedication, and absorption.
Originally, the UWES included 24 items, while a large part of the vigour-items and dedication-items were positively re-phrased MBI-items. These re-formulated MBI items were subsequently supplemented with original vigour and dedication items and new absorption items, to constitute the UWES-24.
After psychometric evaluation in two different samples of employees and students, seven items appeared to be unsound and were therefore eliminated, resulting in a 17-

item questionnaire: six vigour items, five dedication items, and six absorption items (Schaufeli, Salanova *et a*l., 2002). The items concern aspects such as "At my work I am bursting with energy" (vigour); "I am enthusiastic about my job (dedication); and "I am immersed in my work" (absorption). Individuals who score high on vigour are usually considered to have much energy and stamina when working, whereas those who score low on vigour have less energy and stamina as far as their work is concerned. Those who score high on dedication are considered to be able to strongly identify with their work because it is experienced as meaningful, inspiring, and challenging, and they usually feel enthusiastic and proud about their work. Those who score low feel neither enthusiastic nor proud about their work.

Individuals who score high on absorption feel that they usually are contentedly captivated in their work in that they have difficulty detaching from it because it carries them away. Those who score low on absorption do not feel engrossed or immersed in their work; neither do they have difficulty to detach from it. The three sub-scales contained in engagement assist in assessing the different aspects of employee engagement.

The UWES takes about 5 to 10 minutes to complete and may be used for individual assessment as well as for group assessment. The instruction at the top of the UWES test form guides the participant to indicate how often, if at all, he or she experiences the aspects described in each item. The participant is subsequently requested to indicate next to each statement an answer between 0 (never) and 6 (every day) that best describes how frequently he or she feels that way. The UWES has furthermore been designed to avoid bias that might result from specific connotations related to the term "employee engagement". The title therefore reads: "Work & Well-being Survey" with UWES between parentheses.

The mean scale score of the three UWES sub-scales is computed by totalling the scores on the particular scale (vigour, dedication and absorption) and dividing the sum by the number of items of the sub-scale involved. A similar procedure is then followed

for the total score. Hence, the UWES yields three sub-scale scores and/or a total score that result in an answer between 0 and 6.

Storm (2002) obtained the following alpha co-efficients for the UWES in a sample of 2396 members of the South African Police Service: Vigour: 0.78; Dedication: 0.89; and Absorption: 0.78.

3.6.2 Total Quality Management Questionnaire

The questionnaire was adopted from Zhang *et al*., (2000) based on variables which include the following:

- top management support
- customer focus
- supplier focus
- employee empowerment
- training and development
- teamwork
- process improvement
- communication
- strategy

A number of issues are investigated under top management's involvement including, amongst others, whether top management has a clear vision when dealing with quality issues Employee involvement and empowerment are analysed to determine if the concept of TQM is embraced. In order for the company to meet customers' changing needs it is important to have continuous improvement which is a pivotal aspect of TQM. Because there is no business without customers, customer focus and satisfaction are also measured. A five-point Likert-scale is used as a measuring system throughout with the following scores: not satisfactory (1), somewhat satisfactory (2), unsure (3), satisfactory (4) and very satisfactory (5).

The instrument was tested and validated on 212 Chinese manufacturing companies (Zhang *et al*, 2000). Table 3 lists Cronbach's alpha for different TQM implementation scales. This table shows that the reliability co-efficients were above 0.838, indicating that the constructs were reliable to measure the non-financial performance.

Table 3: Internal consistency analysis

Scales	**Cronbach's Alpha**
1. top management support	: 0.892
2. customer focus	: 0.875
3. supplier focus	: 0.838
4. employee empowerment	: 0.857
5. training and development	: 0.885
6. teamwork	: 0.883
7. communication	: 0.857
8. strategy	: 0.914
9. process improvement	: 0.883

(Zhang *et al*, 2000:741)

Construct validity was confirmed through Confirmatory Factor Analysis by evaluating convergent validity (factor loadings > 0.7, AVE > 0.5, Construct Reliability > 0.7), discriminant validity (AVE > $Corr^2$), face-content validity (questionnaire review by experts on the field) and nomological validity (significant correlations among the latent constructs and between them, and an independent variable, which they predict satisfactorily). Based on the results for the reliability analysis and validity analysis which were conducted, it is concluded that the TQM instrument is reliable and valid. The data obtained through this instrument can be used for subsequent data analysis.

3.7 PROCEDURE

3.7.1 Preliminary Arrangements

Permission was given by the Managing Director of Sasol Wax (RSA) to use employees of Sasol Wax for the study, see the Appendix. An e-mail was sent out to all line managers requesting their co-operation in the completion of the questionnaires.

3.7.2 Ethical Aspects

Ethical considerations of confidentiality and privacy were addressed. A concerted and conscious effort was made at all times to uphold this promise. A guarantee was given to the respondents that their names will not be revealed in the research report.

The sampling technique used for this study was probability sampling. A list of all employees was received from the Sasol Wax (RSA) HR department of the company. A consecutive number was assigned to each of the employees from 1 to 583. A computer program (Excel random generator) was then used to generate a list of random numbers from which a sample of 200 employees was randomly drawn out of a population of 583. An e-mail was sent to the selected employees to participate in the research. Hard copies of the questionnaires were also distributed to those who have no access to e-mail. The objectives and nature of the research were explained, as well as the different constructs, and put in relation to the value it holds for the person and the organisation. The questionnaires were conducted anonymously, requiring the people to respond either directly by e-mail or indirectly via the boxes placed in the control rooms by means of hard-copies.

Timelines were indicated on the questionnaires and agreed upon. Voluntary participation was highlighted and participants were thanked for their involvement.

3.7.3 Administration of the measuring instruments

A covering letter was compiled and attached to the questionnaires. The purpose of the letter was to encourage employees to understand the purpose of the study, to kindly ask for their assistance and to motivate them to complete the questionnaire. The covering letter also explained the auspices under which the study is conducted and the context of employee engagement and TQM practices being investigated. The covering letter also assured the respondent that the information will be kept confidential.

The researcher took full responsibility for the administration of the questionnaires and helped with any queries the respondents had.

3.7.4 Data capturing and feedback

After the completed questionnaires were handed in, the data was captured in an MS Excel spread sheet to facilitate statistical analysis. Written feedback will be given to respondents who indicated that this was what they required. Feedback will also be provided to the management of Sasol Wax regarding the response. The HR Department of Sasol Wax also indicated that they would appreciate feedback from the study.

3.8 STATISTICAL ANALYSIS

The statistical analysis was carried out with the help of the SPSS and STATISTICA statistical programs (SPSS Inc, 2007; StatSoft, Inc, 2006). Descriptive statistics and effect sizes were used to decide on the significance of the findings. The results are to be described and compared by way of mean and standard deviations. In this study, the mean is to be used to measure the central tendency of the results. The standard deviation presents the average distance of the individual scores from the mean.

The exploratory factor analysis (EFA) was carried out to determine the validity of the UWES and the TQM questionnaires. The reason why EFA was used as opposed to confirmatory factor analysis (CFA) was because of the small number of participants

(*N*=166). Hoelter (1983:325) recommended that a minimum of 200 participants should be included before carrying out CFA; hence EFA was employed in this study.

Firstly, a simple principal components analysis was conducted on the items of the questionnaires to determine the number of factors. For this purpose both the screet plot and eigen values were evaluated. Secondly, a principal axis factoring analysis with a direct Oblimin rotation was conducted in order to identify the factor loadings of the items on both questionnaires. Communalities ($r > 0.20$) were evaluated to determine the amount of variance each item explained in terms of the other items. The factor correlation matrix was evaluated to determine if factors correlated with each other. In cases where factors were related ($r > 0.30$) an Oblimin rotation was employed while a Varimax rotation was employed when in cases where factors were not related ($r < 0.30$).

Cronbach alpha co-efficients were used to assess the reliability of the constructs that are measured in this study.

Pearson product-moment correlation coefficients were used to specify the relationship between the relevant variables. The product-moment co-efficient of correlation was used to calculate the relationship between sets of ordered pairs in order to obtain more precise approximations of the direction and degree of relationship. Product-moment co-efficient of correlation is based on the related variation of the members of sets of ordered pairs. If they vary together, it is said that there is a positive or negative correlation as the case may be. Thus, if a relationship exists between the variables, it can be termed a positive relationship. A negative relationship occurs when a decrease in the measurement of one variable leads to an increase in the other variable (Ferguson, 1981). If they do not co-vary, it is said that no relationship exists (Kerlinger & Lee, 2000). In terms of statistical significance, it is decided to set the value at a 95% confidence interval level $p \leq 0.05$.

Effect sizes (Cohen, 1988; Steyn, 1999) are used in addition to statistical significance to determine the practical significance of relationships. Effect sizes provide insight whether obtained results are important (while statistical significance may often show results

which are of little practical relevance). The use of only statistical significance testing in a routine manner has been regarded as problematic and various editors have appealed to place more emphasis on effect sizes (Steyn, 1999). Cut-off points of 0.30 (medium effect, Cohen, 1988) and 0.50 (large effect) are set for the practical significance of correlation coefficients.

T-tests and ANOVA were employed to determine differences between the groups in the sample. Effect size (Cohen, 1988:15; Steyn, 1999:12) was used in addition to statistical significance to determine the significance of relationships. Effect sizes served to indicate whether the results obtained were practically significant.

3.9 RESEARCH HYPOTHESIS

The following research hypotheses are formulated for the purposes of this study:

H1: Statistically and practically significant positive relationship exists between employee engagement and TQM practices.

H2: There is a significant relationship between vigour and quality.

H3: There is a significant relationship between dedication and quality.

H4: There is a significant relationship between absorption and quality.

3.10 CHAPTER SUMMARY

This chapter dealt with all the aspects pertaining to the method used for the empirical study. The choice and compilation of the participants, measuring battery, administration and scoring of the measuring instruments were discussed and the statistical methods used to analyse the data were discussed.

Chapter 4 deals with the report and discussion of results of the empirical study.

CHAPTER 4: EMPIRICAL RESULTS AND DISCUSSION

4.1 INTRODUCTION

The previous chapter gave an outline of the methodology and techniques applied to conduct the empirical research. In this chapter the results of the empirical study are reported and discussed. Firstly, the results from the biographical questionnaire will be discussed and secondly, an interpretation of the data from the instruments used will be presented. Finally, the hypotheses are tested and will be reported on.

4.2 BIOGRAPHICAL QUESTIONNAIRE

Before the descriptive information is discussed, this section introduces the biographical profile of the sample (refer to Table 4). Biographical information is reported for gender, age group, race, level of employment, duration of employment and qualification.

A total of 166 questionnaires were received representing a response rate of 83%.
Table 4 indicates the numeric dispersion of the sample. The sample consists of 166 subjects with 126 males (75.9%) representing the majority of the sample and 40 (24.1%) females comprising the minority of the sample.

Regarding age, the table depicts that the largest group is 85 (51.2%) of the sample that indicated that they are between 31 and 40 years of age. The second largest group is 42 (25.3%) of the subjects that indicated that they are between the ages of 41 and 59 years. The 37 (22.3%) subjects in the 3rd largest group are between the ages of 21 and 30 years. There was only one person below 20 years and only one person above 60 years.

Regarding their race, the largest group is those 88 (53%) subjects of the sample who indicated that they are Blacks. The second largest group (38.6%) was Whites whilst the Indians and Coloureds were 4.2% and 3.6% respectively.

The majority of respondents are middle managers (50.0%) followed by junior employees (37.7%) and senior management (13.9%). There was only one respondent in top management.

Table 4: Biographical Profile of the Respondents

Item	Category	Frequency	Percentage
Gender	Male	126	75.9
	Female	40	24.1
Age Group (years)	≤20	1	0.6
	21 – 30	37	22.3
	31 – 40	85	51.2
	41 – 59	42	25.3
	≥60	1	0.6
Race	Black	88	53.0
	White	64	38.6
	Coloured	6	3.6
-	Indian	7	4.2
	Other	1	0.6
Level of Employment	Junior	59	35.5
	Middle	83	50.0
	Senior	23	13.9
	Top	1	0.6
Duration of Employment (years)	0 – 2	12	7.2
	3 - 5	33	19.9
	6 - 10	33	19.9
	>10	88	53.0
Qualification	Below Matric	5	3.0
	Matric	59	35.5
	Diploma / Degree	84	50.6
	Post-graduate	18	10.8

Regarding qualification, majority (50.6%) of the respondents have either a diploma or a degree followed by those who only have matric. 10.8% of the respondents have a post-graduate qualification while the minority (3%) do not have matric.

4.3 DESCRIPTIVE STATISTICS

4.3.1 Employee Engagement

Results for the employee engagement of the research are presented in Table 6. The Utrecht Work and Wellbeing Survey was used. For the purpose of the study, the UWES theoretical scores of vigour, dedication and absorption were calculated (Schaufeli & Bakker 2003) and will be compared with the results obtained from the factor analysis.
Vigour = Mean (B1, B4, B8, B12, B15, B17) where B followed by a number refers to a specific question on the UWES questionnaire as shown in Table 6.
Dedication = Mean (B2, B5, B7, B10, B13) and Absorption = Mean (B3, B6, B9, B11, B14, B16). Table 5 and Figure 3 represent the mean values recorded.

Table 5: Mean values of Vigour, Dedication and Absorption

Dimension	Mean	Std. Deviation
Vigour	3.91	1.22
Dedication	4.09	1.45
Absorption	3.69	1.40

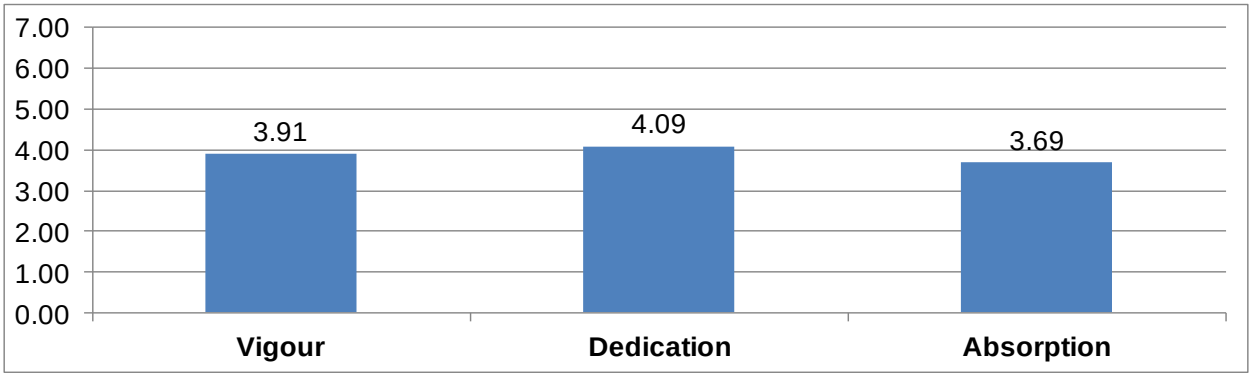

Figure 3: Mean values of UWES dimensions

Table 6: Results of the Work and well-being survey (UWES)

Answer Option		Never	Almost Never	Rarely	Sometimes	Often	Very Often	Always	Missing	Total	Mean	Standard Deviation
B1	At my work, I feel bursting with energy.	4	2	18	49	49	35	9	0	166	3.67	1.247
B2	I find the work that I do full of meaning and purpose.	1	5	13	24	44	41	38	0	166	4.29	1.384
B3	Time flies when I am working.	3	5	8	24	49	44	32	1	166	4.25	1.377
B4	At my job, I feel strong and vigorous.	2	5	20	37	40	41	21	0	166	3.90	1.387
B5	I am enthusiastic about my job.	0	7	20	26	29	47	36	1	166	4.19	1.469
B6	When I am working, I forget everything else around me.	8	13	28	36	41	27	11	2	166	3.30	1.536
B7	My job inspires me.	7	3	20	43	31	38	23	1	166	3.78	1.530
B8	When I get up in the morning, I feel like going to work.	11	12	24	24	51	26	17	1	166	3.44	1.650
B9	I feel happy when I am working intensely.	3	7	9	34	53	39	20	1	166	3.96	1.352
B10	I am proud of the work that I do.	3	7	7	30	34	44	39	1	165	4.27	1.479
B11	I am immersed in my work.	2	8	12	31	59	40	11	3	166	3.85	1.275
B12	I can continue working for very long periods at a time.	3	14	7	30	46	47	17	2	166	3.90	1.455
B13	To me, my job is challenging.	3	6	16	39	37	46	19	0	166	3.90	1.404
B14	I get carried away when I am working.	3	6	22	44	48	28	15	0	166	3.64	1.349
B15	At my job, I am very resilient, mentally.	2	3	9	41	52	43	14	2	166	3.97	1.200
B16	It is difficult for me to detach myself from my job.	11	11	31	44	40	18	10	1	166	3.12	1.509
B17	At my work, I always persevere, even when things do not go well.	0	2	9	20	43	49	43	0	166	4.55	1.219

4.3.2 Total Quality Management

Results for the total quality management of the research are presented in Table 7. The total quality management questionnaire was used.

Table 7: Results of the Total Quality Management questionnaire

		Strongly disagree	Slightly Disagree	Neutral view	Slightly agree	Strongly Agree	Missing	Total	Mean	Standard Deviation
C1	There are clear quality goals identified by top management	12	32	18	45	59	0	166	3.64	1.330
C2	Top management often discusses the importance of quality	12	11	26	59	58	0	166	3.84	1.186
C3	Top level managers view quality as more important than cost	12	21	37	53	43	0	166	3.57	1.208
C4	Customers feedback is used to determine customer requirements	0	12	25	72	56	1	166	4.04	.886
C5	Customer feedback is used as the basis for measuring quality	1	14	30	65	56	0	166	3.97	.956
C6	We have a lot of customer complaints related to quality	11	31	27	49	48	0	166	3.55	1.267
C7	Quality and not price is the prime criteria in supplier selection	10	25	59	42	28	2	166	3.32	1.113
C8	Suppliers are treated as customers whose feedback is important in the quest for improvement	2	23	45	59	35	2	166	3.62	1.011
C9	Long term relationship is encouraged with suppliers	2	12	38	58	54	2	166	3.91	.981
C10	My manager trust me in carrying out my actions	5	22	24	56	59	2	166	3.86	1.135
C11	Employees are empowered to take corrective decisions on the spot without looking up to managers for their approval	20	33	36	53	24	0	166	3.17	1.249
C12	I can decide the best way to do my wok	16	22	25	68	35	166	166	3.51	1.235
C13	I have all the required resources to execute my job properly	10	28	33	57	38	166	166	3.51	1.190
C14	Employees are encouraged to participate in education and training within the company	17	35	25	45	43	1	166	3.38	1.345
C15	Employee training is provided in quality principles	25	30	40	43	28	0	166	3.11	1.309
C16	Senior managers allocate adequate resources towards effort to improve quality	13	37	50	42	24	0	166	3.16	1.162
C17	There are rewards for quality improvements	36	40	34	34	22	0	166	2.80	1.346
C18	Financial incentives are used to reward quality improvements	37	37	36	38	18	0	166	2.78	1.318
C19	Non-financial incentives are used to reward quality improvements	29	24	59	34	20	0	166	2.95	1.240

		Strongly disagree	Slightly Disagree	Neutral view	Slightly agree	Strongly Agree	Missing	Total	Mean	Standard Deviation
C20	There is emphasis on team based problem solving approach rather than individual/department based approach	20	36	35	50	25	0	166	3.14	1.261
C21	People in the work unit share responsibility for the success and failure of their work	25	43	26	54	17	1	166	2.97	1.271
C22	Work decisions are made through consensus	18	39	40	53	15	1	166	3.05	1.168
C23	We use statistical control charts to control processes	9	24	33	69	31	0	166	3.54	1.115
C24	We use inspection for quality control	6	15	31	58	56	0	166	3.86	1.095
C25	We have a program to find wasted time and costs in all internal processes	26	21	53	41	25	0	166	3.11	1.265
C26	Management provide regular customer/ supplier feedback	12	32	47	50	25	0	166	3.27	1.150
C27	The quality management system contributes to collection and integration of information used for decision making	8	30	50	61	17	0	166	3.30	1.034
C28	The company practices continuous improvement in communication between employees and managers	13	30	32	56	34	1	166	3.41	1.225
C29	Meeting and exceeding customer expectation is accorded a higher strategic priority than short-term production target	11	26	44	59	26	0	166	3.38	1.126
C30	Leaders in the organization try to plan ahead for technological and organisational changes that might affect the future performance	18	18	30	65	35	0	166	3.49	1.244

The results of the factor analysis are shown below.

4.4 FACTOR ANALYSIS

4.4.1 Employee Engagement

In order to meet the research objectives; the proposed theoretical dimensions of employee engagement had to be confirmed. Factor analysis was used to investigate the intended scales in the UWES questionnaire. The Kaiser-Maier-Olkin test as well as Bartlett's test of sphericity was conducted in order to evaluate sampling adequacy. KMO takes values between 0 and 1, with small values meaning that overall the variables have too little in common to warrant factor analysis. Values above 0.70 are usually considered to be acceptable.

The KMO value for the engagement dimensions was 0.924. Bartlett's test of sphericity was significant for this analysis. A number of factor solutions were investigated, considering guidelines such as the Kaizer criterion (Eigen values larger than unity), the screed plot, the amount of variance explained by the factors, as well as the clarity and size of the factor loadings. Most importantly though, the factors should also make sense. A principle axis factor analysis with direct oblimin rotation was performed.

The proposed dimensions of employee engagement did not result in strong factor loadings and therefore the original dimensions were combined into two factors. The factors were identified as dimensions of employee engagement, explaining a total of 59% of the variance in these questions. The factors were named as follows; Factor 1: Vigour-Dedication and Factor 2: Absorption. (Table 8)

Vigour is characterised 'by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties' (Schaufeli & Bakker, 2003). *Dedication* refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge' (Schaufeli & Bakker, 2003). Items of Absorption loaded on Factor 2. *Absorption*, is characterized 'by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work' (Schaufeli & Bakker, 2003)

Table 8: The results of the factor loadings for employee engagement

	Question	Factor	
		Vigour/Dedication	Absorption
B8	When I get up in the morning, I feel like going to work.	.892	
B7	My job inspires me.	.843	
B4	At my job, I feel strong and vigorous.	.833	
B2	I find the work that I do full of meaning and purpose.	.832	
B9	I feel happy when I am working intensely.	.661	
B10	I am proud of the work that I do.	.574	
B5	I am enthusiastic about my job.	.516	
B15	At my job, I am very resilient, mentally.	.503	
B6	When I am working, I forget everything else around me.		.796
B12	I can continue working for very long periods at a time.		.692
B14	I get carried away when I am working.		.662
B16	It is difficult for me to detach myself from my job.		.632
B3	Time flies when I am working.		.539
B11	I am immersed in my work.	.316	.468
B17	At my work, I always persevere		.410
B13	To me, my job is challenging.	.331	.400
B1	At my work, I feel bursting with energy.		.362

Following the identification and labeling of the factors, the internal consistency (reliability) of the sub-scale scores were calculated and evaluated by means of Cronbach's Alpha. The value of Alpha, the item-total correlations as well as the average inter-item correlation were taken into account.

Factor reliability of the identified dimensions of employee engagement is presented in Table 9.

Table 9: Results of the factor reliability for the identified dimensions of engagement

Factor	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Vigour-Dedication	.921	.921	8
Absorption	.879	.880	9

The factor reliabilities of the vigour-dedication dimension and absorption were 0.921 and 0.879 respectively indicating strong reliabilities.

Lastly, the new sub-scale scores were calculated, using the mean score on the items per factor. Results are presented in Table 10 and Figure 4. These scores are similar to the scores calculated from theoretical dimensions of vigour, dedication and absorption shown in Table 5 and Figure 3 above.

Table 10: Descriptive statistics of the two dimensions of employee engagement

Factor	Mean	Minimum	Maximum	Range	Variance
Vigour-Dedication	3.977	3.472	4.289	.818	.075
Absorption	3.785	3.101	4.553	1.453	.198

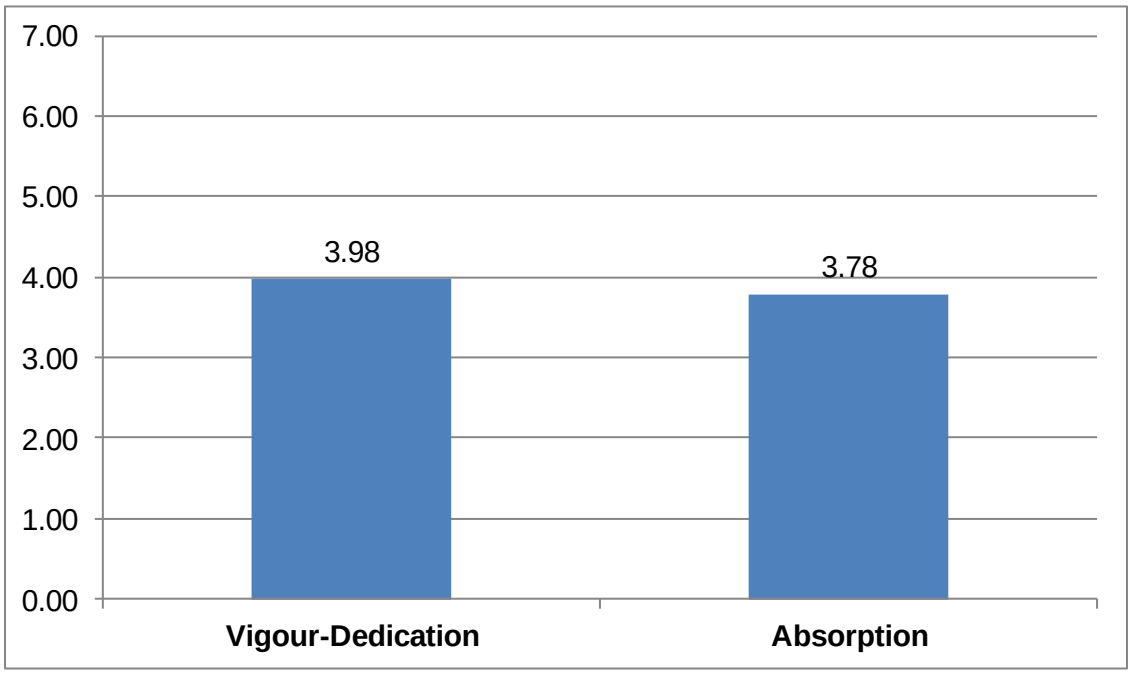

Figure 4: Mean values of the two factors of employee engagement

4.4.2 Total Quality Management (TQM)

As done above with employee engagement, the analysis of the data could only be done once the proposed dimensions of total quality management had been confirmed. Factor analysis was again used to investigate the construct validity of the scales in the questionnaire. The Kaiser-Maier-Olkin test as well as Bartlett's test of sphericity were obtained in order to evaluate sampling adequacy. KMO takes values between 0 and 1, with small values meaning that overall the variables have too little in common to warrant factor analysis. Values above 0.70 are usually considered to be acceptable.

The KMO value for the TQM questionnaire was 0.858. Bartlett's sphericity was significant. A number of factor solutions were again investigated considering guidelines such as the Kaizer criterion (Eigen values larger than unity), the screed plot, the amount of variance explained by the factors, as well as the clarity and size of the factor loadings.

For the TQM questionnaire, seven factors were identified, explaining 68.3% of variance. The factors were named as follows:

Factor 1: Reward and Training

Factor 2: Supplier Focus

Factor 3: Empowerment

Factor 4: Top Management Support

Factor 5: Process Improvement

Factor 6: Customer Focus

Factor 7: Teamwork

Table 11 presents the results of factor analysis of TQM

Table 11: Results of the factor analysis of TQM

	Factor						
	1	2	3	4	5	6	7
	Reward and Training	Supplier Focus	Empowerment	Top Management support	Process Improvement	Customer Focus	Teamwork
C17	.825						
C19	.642						
C16	.582			.209			
C15	.569						
C18	.567						
C26	.466		-.203		-.202	-.340	
C27	.436		-.233		-.382		
C14	.432	-.244	.358				
C30	.351	.278			-.218		
C7		.695					
C8		.663				-.295	
C9		.574		-.211			
C11			.770				
C12			.729				
C10			.668				
C13			.343				-.216
C2				.751			
C1				.683			
C3	.207			.442			
C23					-.805		
C24					-.669		
C25				-.213	-.668		
C28	.277				-.357		-.334
C4						-.736	
C5						-.699	
C21							-.854
C22							-.813
C20	.237		.226				-.550
C29	.280						-.356
C6						-.202	.230

Following the identification and labelling of the factors, the internal consistency (reliability) of the sub-scale scores were calculated and evaluated by means of Cronbach's Alpha. The value of Alpha, the item-total correlations as well as the average inter-item correlation were taken into account. Factor reliability of the identified dimensions of TQM is presented in Table 12.

Table 12: Results of the factor reliability for the dimensions of TQM

Factor	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Reward and Training	.880	.882	9
Supplier Focus	.789	.792	3
Empowerment	.754	.753	3
Top Management Support	.793	.795	3
Process Improvement	.803	.806	4
Customer Focus	.842	.843	2
Teamwork	.648	.659	5

The reliability of six of the factors was well above 0.7 indicating strong reliability but the teamwork dimension gave a factor reliability of only 0.648. An alpha value below 0.7 is also deemed acceptable in social sciences (Field, 2009:675).

Lastly, the subscale scores were calculated, using the mean score on the items per factor. Results are presented in Table 13 and Figure 5. Subsequent analyses were performed using these factor scores.

Table 13: Descriptive statistics of the dimensions of TQM

Factor	Mean	Minimum	Maximum	Range	Variance
Reward and Training	3.129	2.770	3.479	.709	.064
Supplier Focus	3.620	3.323	3.915	.591	.087
Empowerment	3.396	3.169	3.512	.343	.039
Top Management Support	3.685	3.566	3.843	.277	.020
Process Improvement	3.477	3.103	3.861	.758	.098
Customer Focus	4.012	3.982	4.042	.061	.002
Teamwork	3.219	2.970	3.564	.594	.060

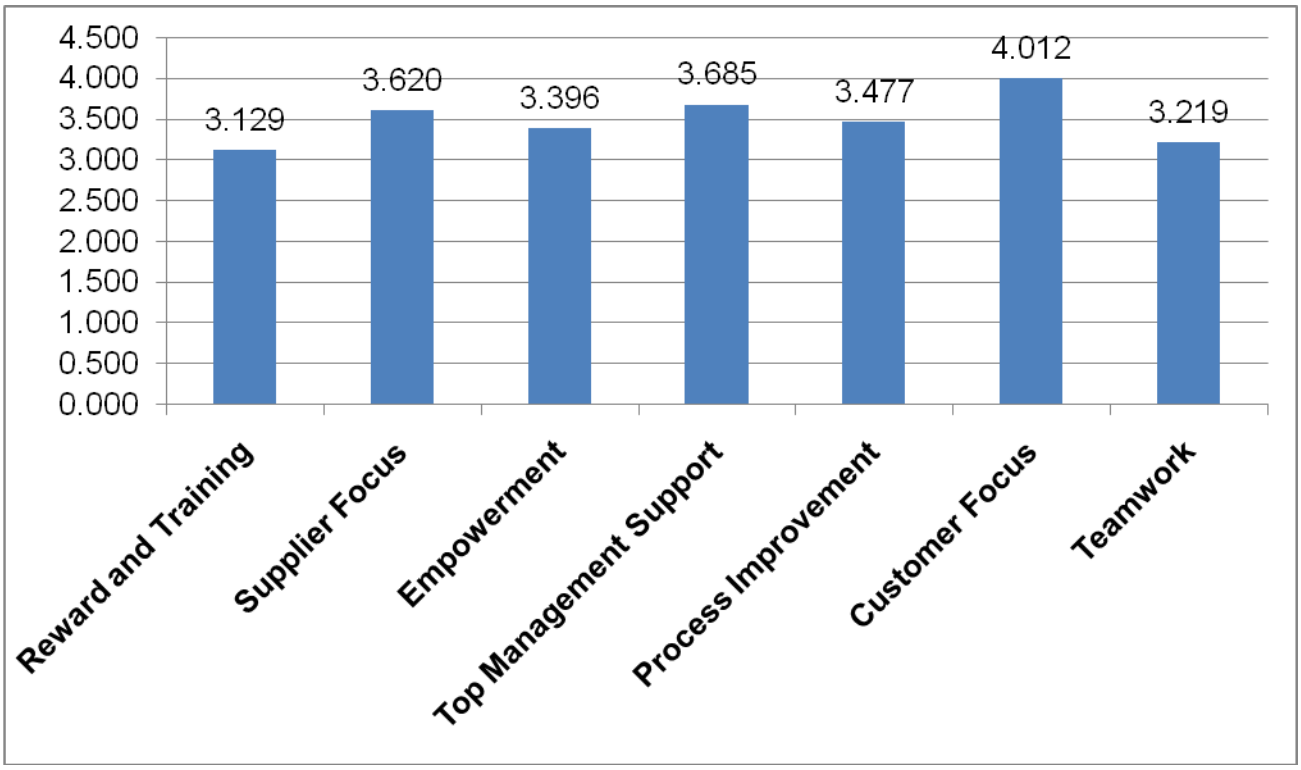

Figure 5: The mean values of the dimensions of TQM

4.5 PRODUCT-MOMENT CORRELATIONS

The results of the product-moment correlation co-efficients between the constructs are reported in Table 14. As indicated in the table, *Vigour-dedication, Absorption and TQM dimensions* are normally distributed. It was therefore decided to use the Pearson product-moment correlations for the two scales.

Table 14: Correlation co-efficients between Engagement and TQM dimensions

	Vigour-Dedication	Absorption	Reward and Training	Supplier Focus	Empowerment	Top Management Support	Process Improvement	Customer Focus	Teamwork
Vigour-Dedication	1	.806**	.421**	.356**	.501**	.392**	.325**	.214**	.397**
Absorption	.806**	1	.358**	.307**	.500**	.335**	.227**	.242**	.391**
Reward and Training	.421**	.358**	1	.388**	.495**	.565**	.570**	.363**	.690**
Supplier Focus	.356**	.307**	.388**	1	.339**	.270**	.393**	.471**	.318**
Empowerment	.501**	.500**	.495**	.339**	1	.383**	.359**	.331**	.488**
Top Management Support	.392**	.335**	.565**	.270**	.383**	1	.460**	.392**	.538**
Process Improvement	.325**	.227**	.570**	.393**	.359**	.460**	1	.419**	.529**
Customer Focus	.214**	.242**	.363**	.471**	.331**	.392**	.419**	1	.413**
Teamwork	.397**	.391**	.690**	.318**	.488**	.538**	.529**	.413**	1

**. Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 14, there is a strong statistical and practical significant correlation between *Vigour-Dedication* and *Absorption* as dimensions of the UWES scale.

The table shows that reward and training dimension is positively correlated to vigour-dedication as well as absorption (practically significant, medium effect).

Supplier focus is positively correlated to vigour-dedication and absorption (practically significant, medium effect). Empowerment is positively correlated to vigour-dedication as well as absorption (practically significant, large effect).

Top management support relates positively to vigour-dedication and absorption (practically significant, medium effect). Process improvement shows a statistically significant, positive relationship with vigour-dedication (practically significant, medium effect), but it does not meet the cut-off point of 0.3 that was set for practical significance when related to absorption.

Customer focus had a weak correlation with the two dimensions of engagement with r which is below 0.3. Teamwork is positively correlated to both vigour-dedication and absorption (practically significant, medium effect).

4.6 T-TEST AND ANOVA

4.6.1 Gender

A t-test was conducted to test whether males and females responded differently to the sections. The p-value and d-values (effect sizes) of the t-test are shown in Table 15 below. The questionnaire was completed by 126 males and 40 females.

Table 15: Results of the t-tests for gender

		N	Mean	Std. Deviation	p value	Effect Size (d)
Vigour-Dedication	Male	126	3.9964	1.15836	.687	.07
	Female	40	3.9125	1.10477		
Absorption	Male	126	3.7143	.99667	.046	.35
	Female	40	4.0681	.88648		
Reward and Training	Male	126	3.1899	.86364	.173	.23
	Female	40	2.9694	.95945		
Supplier Focus	Male	124	3.6640	.89108	.254	.20
	Female	40	3.4833	.79151		
Empowerment	Male	126	3.4524	.92505	.160	.24
	Female	40	3.6938	.99757		
Top management support	Male	126	3.7090	1.06998	.597	.09
	Female	40	3.6083	.97223		
Process improvement	Male	126	3.5456	.94520	.110	.29
	Female	40	3.2750	.87303		
Customer focus	Male	126	4.0119	.86825	.754	.06
	Female	40	3.9625	.85775		
Teamwork	Male	126	3.2153	.79048	.891	.02
	Female	40	3.2350	.77379		

From the p-values in Table 15 for gender, it can be concluded that for absorption the p-value is smaller than 0.05, indicating that the participants answered the questions in a significantly different manner statistically. For the other dimensions, the p-values are greater than 0.05 indicating the participants answered the questions in a significantly similar manner statistically.

The effect size for absorption has a d-value of 0.426. This d-value is closer to the practically visible difference value and can be considered practically visible.

4.6.2 Age group

Table 16 shows the results of the mean values calculated for the dimensions as a function of the age group. The results of the ANOVA calculation are also shown.

Table 16: Descriptive statistics and ANOVA results for the age group

		N	Mean	Std. Deviation	p value	Effect Sizes		ANOVA	
						21 - 30 with	31 - 40 with	F	Sig.
Vigour-Dedication	21 - 30	37	3.9189	1.17749	0.62			.485	.617
	31 - 40	85	3.9373	1.19554		0.02			
	41 - 59	42	4.1339	1.03018		0.18	0.16		
	Total	164	3.9835	1.14788					
Absorption	21 - 30	37	3.6366	1.02227	0.01			4.540	.012
	31 - 40	85	3.6853	1.00213		0.05			
	41 - 59	42	4.1885	.82211		0.54	0.50		
	Total	164	3.8032	.98496					
Reward and Training	21 - 30	37	3.3213	.78383	0.06			2.842	.061
	31 - 40	85	2.9765	.83026		0.42			
	41 - 59	42	3.2894	1.04999		0.03	0.30		
	Total	164	3.1344	.89183					
Supplier Focus	21 - 30	37	3.6126	.87317	0.41			.892	.412
	31 - 40	84	3.5437	.89140		0.08			
	41 - 59	41	3.7642	.80707		0.17	0.25		
	Total	162	3.6152	.86618					
Empowerment	21 - 30	37	3.6149	1.03346	0.30			1.230	.295
	31 - 40	85	3.4029	.95205		0.21			
	41 - 59	42	3.6488	.83567		0.03	0.26		
	Total	164	3.5137	.94449					
Top management support	21 - 30	37	3.6126	1.07011	0.89			.111	.895
	31 - 40	85	3.6863	.96685		0.07			
	41 - 59	42	3.7222	1.19374		0.09	0.03		
	Total	164	3.6789	1.04623					
Process improvement	21 - 30	37	3.6284	.79193	0.31			1.190	.307
	31 - 40	85	3.3765	.96024		0.26			
	41 - 59	42	3.5714	.99125		0.06	0.20		
	Total	164	3.4832	.93465					
Customer focus	21 - 30	37	4.0946	.84851	0.64			.452	.637
	31 - 40	85	3.9353	.89239		0.18			
	41 - 59	42	4.0119	.82999		0.10	0.09		
	Total	164	3.9909	.86420					
Teamwork	21 - 30	37	3.2865	.79238	0.01			5.419	.005
	31 - 40	85	3.0416	.70882		0.31			
	41 - 59	42	3.5095	.85677		0.26	0.55		
	Total	164	3.2167	.78830					

The p-values for Absorption and Teamwork are both below 0.05 indicating that there was a statistically significant difference in the way the different age groups responded to the questions. This is confirmed by the ANOVA results for the two dimensions. The results for the effect sizes indicate that for Absorption, the d-values values were 0.54 and 0.5 for the age groups 21 – 30 and 31 – 40 respectively when compared to the 41 – 49 age groups. This indicates a medium practically visible difference. In the case of Teamwork a medium practically visible difference is seen between the 31 – 40 and 41 – 59 age groups. For all the other dimensions with p-values above 0.05; there were no significant differences in the responses by different age groups.

4.6.3 Race

Table 17 shows the results of the mean values calculated for the dimensions as a function of race. The results of the ANOVA calculation are also shown.

According to the p-values and the ANOVA results; a significant difference is only noticeable on the dimension of Absorption. However the effect sizes indicate that there are some medium-practically visible and large-practically important differences in the way different races responded to other dimensions.

Table 17: Descriptive statistics and ANOVA results for the different races

				Std.		Effect Sizes			ANOVA	
		N	Mean	Deviatio	p value	Black with	White with	Coloured with	F	Sig.
Vigour-Dedication	Black	88	3.8973	1.19452					1.458	.228
	White	64	3.9563	1.06619		0.05				
	Coloured	6	4.8125	1.40701	0.23	0.65	0.61			
	Indian	7	4.3393	.79292		0.37	0.36	0.34		
	Total	165	3.9722	1.14528						
Absorption	Black	88	3.5632	1.04710					5.207	.002
	White	64	3.9852	.85854		0.40				
	Coloured	6	4.7778	.15713	0.00	1.16	0.92			
	Indian	7	4.2063	.65868		0.61	0.26	0.87		
	Total	165	3.7983	.98333						
Reward and Training	Black	88	3.0901	.86414					2.220	.088
	White	64	3.1302	.92488		0.04				
	Coloured	6	4.0370	.85394	0.09	1.10	0.98			
	Indian	7	3.0000	.69685		0.10	0.14	1.21		
	Total	165	3.1363	.89239						
Supplier Focus	Black	87	3.5977	.93197					.678	.567
	White	63	3.6772	.71333		0.09				
	Coloured	6	3.6111	1.20031	0.57	0.01	0.06			
	Indian	7	3.1905	1.01575		0.40	0.48	0.35		
	Total	163	3.6115	.86485						
Empowerment	Black	88	3.3693	.93386					1.374	.253
	White	64	3.6797	.89473		0.33				
	Coloured	6	3.6250	1.58706	0.25	0.16	0.03			
	Indian	7	3.5000	.81650		0.14	0.20	0.08		
	Total	165	3.5045	.94533						
Top management support	Black	88	3.6174	1.13184					1.624	.186
	White	64	3.7917	.89384		0.15				
	Coloured	6	4.2222	.91084	0.19	0.53	0.47			
	Indian	7	3.0952	1.22798		0.43	0.57	0.92		
	Total	165	3.6848	1.04846						
Process improvement	Black	88	3.5568	.93136					.722	.540
	White	64	3.3633	.92574		0.21				
	Coloured	6	3.6250	.99687	0.54	0.07	0.26			
	Indian	7	3.2500	.91287		0.33	0.12	0.38		
	Total	165	3.4712	.92822						
Customer focus	Black	88	3.9261	.87277					.586	.625
	White	64	4.0469	.88065		0.14				
	Coloured	6	4.3333	.81650	0.63	0.47	0.33			
	Indian	7	4.0714	.60749		0.17	0.03	0.32		
	Total	165	3.9939	.86248						
Teamwork	Black	88	3.2045	.78841					.325	.807
	White	64	3.2052	.83015		0.00				
	Coloured	6	3.5000	.57619	0.81	0.37	0.36			
	Indian	7	3.3429	.52554		0.18	0.17	0.27		
	Total	165	3.2214	.78640						

4.6.4 Level of Employment

Table 18 shows the results of the mean values calculated for the dimensions as a function of the level of employment. The results of the ANOVA calculation are also shown.

Table 18: Descriptive statistics and ANOVA results for the level of employment

		N	Mean	Std. Deviation	p value	Effect Sizes		ANOVA	
						Junior with	Middle with	F	Sig.
Vigour-Dedication	Junior	59	3.6465	1.23476	0.02			4.210	.016
	Middle	83	4.1681	1.00429		0.42			
	Senior	23	4.1933	1.19981		0.44	0.02		
	Total	165	3.9851	1.14056					
Absorption	Junior	59	3.5330	1.08862	0.03			3.699	.027
	Middle	83	3.9558	.87770		0.39			
	Senior	23	3.9686	.91827		0.40	0.01		
	Total	165	3.8064	.97944					
Reward and Training	Junior	59	3.1382	.91565	0.28			1.267	.284
	Middle	83	3.0669	.91574		0.08			
	Senior	23	3.4010	.70967		0.29	0.36		
	Total	165	3.1390	.89198					
Supplier Focus	Junior	59	3.7062	.90990	0.18			1.741	.179
	Middle	81	3.5062	.82850		0.22			
	Senior	23	3.8406	.86963		0.15	0.38		
	Total	163	3.6258	.86842					
Empowerment	Junior	59	3.3814	1.02064	0.32			1.151	.319
	Middle	83	3.6235	.83864		0.24			
	Senior	23	3.4891	1.08313		0.10	0.12		
	Total	165	3.5182	.94335					
Top management support	Junior	59	3.6441	1.02435	0.03			3.758	.025
	Middle	83	3.5783	1.08211		0.06			
	Senior	23	4.2319	.78775		0.57	0.60		
	Total	165	3.6929	1.04310					
Process improvement	Junior	59	3.4619	.89276	0.31			1.171	.313
	Middle	83	3.4307	.94781		0.03			
	Senior	23	3.7609	.95786		0.31	0.34		
	Total	165	3.4879	.93084					
Customer focus	Junior	59	4.0508	.86451	0.81			.205	.815
	Middle	83	3.9578	.90798		0.10			
	Senior	23	4.0217	.73048		0.03	0.07		
	Total	165	4.0000	.86603					
Teamwork	Junior	59	3.2610	.78719	0.36			1.040	.356
	Middle	83	3.1518	.79055		0.14			
	Senior	23	3.4058	.73743		0.18	0.32		
	Total	165	3.2263	.78252					

The p-values for vigour-dedication, absorption and top management support are all below 0.05 indicating a significant difference in the way different levels of employment responded. This is confirmed by the ANOVA results. The effect sizes indicate that there are some medium-practically visible differences in the way the various levels responded to the three dimensions.

4.6.5 Duration of Employment

Table 19 shows the results of the mean values calculated for the dimensions as a function of the duration of employment. The results of the ANOVA calculation are also shown.

Table 19: Descriptive statistics and ANOVA results for the duration of employment

		N	Mean	Std. Deviation	p value	ANOVA F	ANOVA Sig.
Vigour-Dedication	0 - 2 yrs	12	4.4063	1.41534	0.59	.635	.593
	3 - 5 yrs	33	3.9848	1.11180			
	6 - 10 yrs	33	3.9021	1.11979			
	> 10 yrs	88	3.9420	1.13115			
	Total	166	3.9762	1.14293			
Absorption	0 - 2 yrs	12	4.3704	1.02311	0.11	2.073	.106
	3 - 5 yrs	33	3.6902	.93943			
	6 - 10 yrs	33	3.5926	.99794			
	> 10 yrs	88	3.8403	.96567			
	Total	166	3.7995	.98047			
Reward and Training	0 - 2 yrs	12	3.7130	.87676	0.06	2.535	.059
	3 - 5 yrs	33	3.2088	.83968			
	6 - 10 yrs	33	2.9125	.76415			
	> 10 yrs	88	3.1154	.92880			
	Total	166	3.1368	.88971			
Supplier Focus	0 - 2 yrs	12	3.8889	.80821	0.68	.507	.678
	3 - 5 yrs	33	3.6667	.94648			
	6 - 10 yrs	33	3.5556	.88060			
	> 10 yrs	86	3.5891	.84895			
	Total	164	3.6199	.86898			
Empowerment	0 - 2 yrs	12	3.9583	.97020	0.31	1.213	.307
	3 - 5 yrs	33	3.4545	.96512			
	6 - 10 yrs	33	3.3636	.85944			
	> 10 yrs	88	3.5256	.96195			
	Total	166	3.5105	.94562			

Table 19 continued

		N	Mean	Std. Deviation	p value	ANOVA F	ANOVA Sig.
Top management support	0 - 2 yrs	12	4.0000	1.23091	0.63	.584	.626
	3 - 5 yrs	33	3.5960	1.10792			
	6 - 10 yrs	33	3.5758	.99398			
	> 10 yrs	88	3.7159	1.02153			
	Total	166	3.6847	1.04528			
Process improvement	0 - 2 yrs	12	3.9375	.91779	0.07	2.437	.067
	3 - 5 yrs	33	3.7273	.83937			
	6 - 10 yrs	33	3.3106	.75785			
	> 10 yrs	88	3.3892	1.00133			
	Total	166	3.4804	.93298			
Customer focus	0 - 2 yrs	12	4.1667	.80716	0.11	2.045	.110
	3 - 5 yrs	33	4.2424	.79177			
	6 - 10 yrs	33	3.7424	.90244			
	> 10 yrs	88	3.9830	.86586			
	Total	166	4.0000	.86340			
Teamwork	0 - 2 yrs	12	3.8167	.64644	0.03	3.017	.032
	3 - 5 yrs	33	3.0606	.74075			
	6 - 10 yrs	33	3.1333	.80104			
	> 10 yrs	88	3.2311	.78354			
	Total	166	3.2201	.78420			

According to the p-Value of 0.03 and the ANOVA results, a significant difference is only observed for the dimension of teamwork.

4.6.6 Qualification

Table 20 shows the results of the mean values calculated for the dimensions as a function of qualification. The results of the ANOVA calculation are also shown.

Table 20: Descriptive statistics and ANOVA results for the qualification

		N	Mean	Std. Deviation	p value	ANOVA F	ANOVA Sig.
Vigour-Dedication	Below Matric	5	4.5000	1.37784		1.051	.372
	Matric	59	3.8154	1.23785			
	Diploma/Degree	84	4.0037	1.04860	0.37		
	Post Graduate	18	4.2292	1.18061			
	Total	166	3.9762	1.14293			
Absorption	Below Matric	5	4.4000	1.05877		.720	.542
	Matric	59	3.7476	1.13665			
	Diploma/Degree	84	3.8163	.83231	0.54		
	Post Graduate	18	3.7245	1.07414			
	Total	166	3.7995	.98047			
Reward and Training	Below Matric	5	4.4000	.59628		4.225	.007
	Matric	59	3.1438	.84068			
	Diploma/Degree	84	3.0238	.90169	0.01		
	Post Graduate	18	3.2901	.81306			
	Total	166	3.1368	.88971			
Supplier Focus	Below Matric	5	4.6000	.36515		5.748	.001
	Matric	59	3.8418	.84044			
	Diploma/Degree	83	3.4859	.85429	0.00		
	Post Graduate	17	3.2157	.78121			
	Total	164	3.6199	.86898			
Empowerment	Below Matric	5	4.3500	.60208		2.416	.068
	Matric	59	3.5212	.93919			
	Diploma/Degree	84	3.3899	.96423	0.07		
	Post Graduate	18	3.8056	.82049			
	Total	166	3.5105	.94562			
Top management support	Below Matric	5	4.2667	.92496		.792	.500
	Matric	59	3.6780	.99224			
	Diploma/Degree	84	3.7024	1.07549	0.50		
	Post Graduate	18	3.4630	1.11519			
	Total	166	3.6847	1.04528			
Process improvement	Below Matric	5	4.4500	.32596		2.572	.056
	Matric	59	3.5847	.87913			
	Diploma/Degree	84	3.3720	.97135	0.06		
	Post Graduate	18	3.3750	.89216			
	Total	166	3.4804	.93298			
Customer focus	Below Matric	5	4.8000	.44721		4.539	.004
	Matric	59	4.2288	.81644			
	Diploma/Degree	84	3.8512	.83153	0.00		
	Post Graduate	18	3.7222	.98850			
	Total	166	4.0000	.86340			
Teamwork	Below Matric	5	4.1200	.87864		2.407	.069
	Matric	59	3.2034	.74694			
	Diploma/Degree	84	3.1683	.77873	0.07		
	Post Graduate	18	3.2667	.81746			
	Total	166	3.2201	.78420			

The p-Values and ANOVA results from Table 20 indicate that significant differences are only observed for the responses to reward and training, supplier focus and customer focus with respect to the qualifications.

4.7 DISCUSSION

The general aim of the study was to determine the effect of employee engagement on the performance in a form of quality in the petrochemical industry. To achieve the general objective, specific objectives were determined and analysed through statistical properties of the two measuring instruments (UWES and TQM), namely to determine their construct validity, reliability as well as the correlation between the instruments, and to determine the demographic differences between groups in the experience of engagement and TQM principles.

To answer the first objective of the study with regard to the conceptualisation of engagement and TQM, from the literature review, it came out that organisations wish to increase employee engagement, given that engaged employees are willing to make use of their full potential in their work roles in a positive way (Kahn, 1990:694), have better wellbeing (Hallberg & Schaufeli, 2006:120), are more productive and remain in their jobs for longer (Saks, 2006:602; Schaufeli and Bakker, 2004:293).

Mohrman *et al*. (1995:26) emphasise that the key to TQM is the definition of quality as meeting customer requirements, and a belief that the organisational capability to deliver quality is enhanced by continuously improving the capacity of the work processes of the organisation to deliver value to customers.

The Gallup Organisation (2004) found critical links between employee engagement, customer loyalty, business growth and profitability.

The second objective of this study was to determine the factor structure and internal consistency of the UWES. The results of this study revealed that engagement is a two factor model after the principle factor extraction was done. All the items loaded in total

on Factor 1 (labelled *Vigour-Dedication*) and Factor 2 (labelled *Absorption*). This two-factor model explained 59% of the total variance. However, in a study by Coetzer and Rothmann (2007), they found acceptable fit for purpose statistics for the three-dimensional structure of the UWES for employees in an insurance company. Storm and Rothmann (2003) and Naudé (2003) established that there are high correlations between work engagement dimensions (Vigour-Dedication and Absorption) by which they suggested that work engagement as measured by the UWES, is a two-factor construct. Therefore the results of this study also confirm that the UWES is a two-factor construct.

The Cronbach Alpha co-efficients showed acceptable internal consistency for both dimensions (0.92 for *Vigour-Dedication* and 0.88 for *Absorption*), which is above the guideline as prescribed by Nunnally and Bernstein (1994). It can therefore be concluded that the UWES as utilised in this research is a valid and reliable measuring instrument.

To answer the third objective, exploratory factor analysis was conducted on the TQM and the results revealed that the questionnaire has a seven-factor structure with all the items loading on those factors 68% of the total variance. Antony *et al*. (2002) also identified seven critical factors for TQM. The reliability coefficients for their results ranged from 0.62 to 0.95.

The reliabilities of six of the factors identified in this study ranged from 0.75 to 0.88 indicating strong reliability. The factor with a value of 0.65 was also retained as it is also deemed acceptable in social sciences (Field, 2009:675). It can therefore be concluded that the TQM questionnaire as utilised in this research is a valid and reliable measuring instrument.

The fourth objective was to determine the relationship of the dimensions of engagement and performance measure in the form of quality under the umbrella of TQM. The results indicated a strong positive statistical and practical correlation between *Vigour-Dedication* and *Absorption* as dimensions of the UWES scale. Previous studies by Storm and Rothmann (2003) and Naudé (2003) indicated similar outcome of high

correlations between work engagement dimensions of vigour, dedication and absorption. This correlation suggests that energetic and dedicated employees are highly likely to be happy in their work to the extent that they are unlikely to detach themselves from their work.

The results of the product-moment correlation coefficients between the constructs are summarized as follows:

- A positive correlation between reward-training and vigour-dedication as well as absorption (practically significant, medium effect)
- A positive correlation between supplier focus and vigour-dedication as well as absorption (practically significant, medium effect)
- A positive correlation between empowerment and vigour-dedication as well as absorption (practically significant, large effect)
- A positive correlation between top management support and vigour-dedication as well as absorption (practically significant, medium effect)
- A positive correlation between teamwork and vigour-dedication as well as absorption (practically significant, medium effect)

Overall the results indicate that employee engagement has a positive relationship with the dimensions of TQM which is used as a measure of quality, which is a non-financial measure of performance. This finding is in agreement with the conclusions drawn by practitioners and academics that the consequences of employee engagement are positive (Saks, 2006:603). Kahn (1992:322) also proposed that employee engagement leads to both positive outcomes for individuals, (e.g. quality of people's work and their own experiences of doing that work), as well as positive organisational-level outcomes (e.g. the growth and productivity of organisations).

With regard to the fifth objective, some significant differences were found between the various demographic groups and their scores on engagement. The results are summarized as follows:

- Gender: Females were more engaged in terms of absorption, but had similar level of engagement in terms of vigour-dedication.
- Age group: Employees aged in the 41 – 59 category were slightly more engaged than the other groups.
- Race: The coloured group came out as the most engaged followed by the Indians while the Blacks were the least engaged.
- Level of employment: Employees in the middle and senior management levels were the most engaged. Junior employees were the least engaged.
- Duration of employment: Employees with 0 – 2 years experience were the most engaged while the level of engagement was similar for the rest of the employees.
- Qualification: Employees who had no matric qualification were the most engaged.

This study has shown that the use of the UWES is acceptable for measuring engagement of employees in a petrochemical industry because of its construct validity and high level of reliability.
The use of the TQM questionnaire was also suitable because of its construct validity and high level of reliability.

4.8 CHAPTER SUMMARY

In this chapter the results of the empirical research are reported and discussed in terms of the quantitative results.
Two questionnaires were administered, namely the Utrecht Work Engagement Scale (UWES) and Total Quality Management. A biographical questionnaire was also developed to gather demographical data regarding the respondents.
Two factors were extracted from the UWES, accounting for 59% of the total variance.

The factors were labelled vigour-dedication and absorption. Seven factors were extracted from the TQM, accounting for 68% of the total variance.

Acceptable Cronbach alpha co-efficients were found, demonstrating that a large portion of the variance is explained by the dimensions (Nunnally & Bernstein, 1994).
Results indicated that the research hypothesis could be accepted and that there is overall a positive correlation between employee engagement and TQM dimensions.

In Chapter 5 the conclusions pertaining to the research questions, the limitations of the research and conclusions specific to future research and for the organisation are given.

CHAPTER 5: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The purpose of this chapter is to provide conclusions regarding the results obtained in the empirical studies of this research. Conclusions are drawn with regard to the research objectives. Furthermore, limitations that have been identified throughout the course of the study are discussed. Finally, recommendations for the organisation are made and research opportunities that emanate from this research are presented for future research.

5.2 CONCLUSIONS

Conclusions regarding the specific theoretical objectives and the results of the empirical study are made.

5.2.1 Conclusions regarding the specific theoretical objectives

In line with the specific objectives of this study; employee engagement, total quality management as a non-financial measure of organisational performance as well as the effect of employee engagement on performance were conceptualized from the literature.

Most scholars use Schaufeli and Bakker's (2010); Schaufeli, Salanova, González-Romá, & Bakker (2002) definition of employee engagement. Accordingly, employee engagement is a positive, fulfilling, work related state characterized by vigour, dedication, and absorption. Vigour means that employees have high energy levels and great mental resilience. Dedication means being strongly involved in work and being enthusiastic about and proud of one's work. Finally, absorption means being fully concentrated on the work tasks and having the feeling that time flies.

The Gallup Organisation, potentially the most widely recognized name associated with employee engagement due to their best selling book, "*First, Break All the Rules,"* defines engaged employees as those who, "work with a passion and feel a profound

connection to their company" and "drive innovation and move the organisation forward" (Gallup Management Journal, 2006).

Practitioners and academics tend to agree that the consequences of employee engagement are positive (Saks, 2006:603). There is a general belief that there is a connection between employee engagement and business results; a meta-analysis conducted by Harter *et al.* (2002:272) confirms this connection. They concluded that, "…employee satisfaction and engagement are related to meaningful business outcomes at a magnitude that is important to many organisations".
The Gallup Organisation (2004) found critical links between employee engagement, customer loyalty, business growth and profitability. The International Survey Research (ISR) team has similarly found encouraging evidence that organisations can only reach their full potential through emotionally engaging employees and customers (ISR, 2005). In an extension of the Gallup findings, Ott (2007) cites Gallup research, which found that higher workplace engagement predicts higher earnings per share (EPS) among publicly-traded businesses.

Many quality definitions revolve around the identification and satisfaction of customer needs and requirements. All over the world, organisations are working hard to change the ways of business and delivering services to customers. Customers' perception of evaluating products and needs are also changing, driving companies to find ways of ensuring that they move with the times and match ongoing customer needs. Gill (2009:530) states that in any product, quality is meant to ensure that the customer expectations are taken into consideration and that future customer needs are also known, and that planning is done to meet the expectations.
Quality is most often defined as the ability of a product or service to consistently meet or exceed customer expectations. Lillrank (2002:691) classifies quality definitions found in the literature to be divided into four categories: excellence, value for money, conformity to requirements and meeting or exceeding customer requirements. The most widely used definitions from the American Society for Quality and more recently ISO 9000 - 2000, are based on customer satisfaction, which may be achieved not only through

conformance to requirements but through some inherent characteristics of the product or service, and the way it is presented and delivered to the customers (Barnes, 2009). According to Peters (1999:6), quality management originated from two ideas about how to run organisations better. The first idea revolved around customers. If companies could determine what its customers like, they could deliver it the same way every time. Customers will come back to purchase such products and services, and will also tell others about these products and services. The second idea that companies need to explore is efficiency. If companies can figure out the most efficient way to produce a product or service and stop wasting time, materials, replacing poor quality goods or delivering unsatisfactory services, that company will be more successful.

Lau and Tang (2009:410) define TQM as the management philosophy and company practices that aim to harness the human and material resources of an organisation in the most effective way to achieve the objectives of the organisation. TQM is further explained as a management-led process to obtain the involvement of all employees, in the continuous improvement of the performance of all activities, as part of the normal business to meet the needs and satisfaction of both the internal and external customers.

5.2.2 Conclusions regarding the specific empirical objectives

The second objective of this study was to determine the factor structure and internal consistency of the UWES. The results of the factor analysis of the UWES confirmed a two-factor model by using the simple principal factor analysis with a direct Oblimin rotation. The first factor was labelled Vigour-Dedication and the second factor was labelled Absorption. The results obtained using the principal component analysis confirm the previous studies (Storm and Rothmann, 2003; Naudé, 2003; Bosman, 2005 and Lekutle, 2010) that have been done across different samples and occupational groups in South Africa. The exploratory factor analysis conducted on the UWES indicated a two-factor structure for the UWES, few studies, for example Van der Linde (2004) found a two- factor structure of the UWES. A study by Storm and Rothmann (2003) indicated that although the three-factor structure results were satisfactory, the fit with data was superior with the one-factor or two-factor structure.

To answer the third objective, exploratory factor analysis was conducted on the TQM and the results revealed that the questionnaire has a seven-factor structure with all the items loading on those factors 68% of the total variance. Antony *et al*. (2002) also identified seven critical factors for TQM. The reliability co-efficients for their results ranged from 0.62 to 0.95.

The fourth objective was to determine the relationship of the dimensions of engagement and total quality management. Overall the results indicate that employee engagement has a positive relationship with the dimensions of TQM which is used as a measure of quality, which is a non-financial measure of performance. This finding is in agreement with the conclusions drawn by practitioners and academics that the consequences of employee engagement are positive (Saks, 2006:603).

With regard to the fifth objective, significant differences were found between the various demographic groups and their scores on engagement. Females were more engaged in terms of absorption, but had similar levels of engagement in terms of vigour-dedication. Employees aged in the 41 – 59 category were slightly more engaged than the other groups. The coloured group came out as the most engaged followed by the Indians while the Blacks were the least engaged. Employees in the middle and senior management levels were the most engaged. Junior employees were the least engaged. Employees with 0 – 2 years experience were the most engaged while the level of engagement was similar for the rest of the employees. Employees who had no matric qualification were the most engaged

5.3 LIMITATIONS

The following limitations regarding the research were identified:

- There was a low number of participants and the use of the participants within one single organisation, which limit the generalisations that could be made from the results. It also made it impossible to conduct a confirmatory factor analysis with the instruments used. The findings reported in this study may not be generalised as the

results were obtained from a single organisation that does not fully represent the diverse South African population.

- The cross-sectional survey design allows for the identification of the existence of relationships between variables, but implies that more complicated forms of infrequent connections could not be examined. Prospective longitudinal and quasi-experimental research designs are needed to further validate the interpreted relationships within this study.
- The questionnaires were available only in English. Most of the respondent's first language is not English and this may have had an influence on the interpretation of some of the questions.

5.4 RECOMMENDATIONS

Recommendations pertaining to the specific organisation used in this study, as well as recommendations for further research, are made in this section.

5.4.1 Recommendations for the organisation

Research has shown that there is a link between levels of engagement and organisational performance. Human resource practices that have a strong focus on people have demonstrated a significant impact on improvements in productivity, satisfaction and financial performance. In addition, engagement needs to be viewed as a broad organisational strategy that involves all levels of the organisation (Frank *et al.,* 2004:12), a string of actions and steps, which require the contribution and involvement of organisational members (Robinson *et al.,* 2004), as well as consistent, continuous and clear communications (Truss *et al.,* 2006).

Companies with engaged employees have higher employee retention as a result of reduced turnover and reduced intention to leave the company. They also have higher productivity, profitability, growth and customer satisfaction.

Ten points or strategies called 'the ten tablets" as suggested by Markos (2010) to keep employees engaged are recommended.

For managers, work of employee engagement starts at day one through effective recruitment and orientation program, the work of employee engagement begins from the top as it is unthinkable to have engaged people in the organisations where there is no engaged leadership.

Managers should enhance two-way communication, ensure that employees have all the resources they need to do their job, give appropriate training to increase their knowledge and skill, establish reward mechanisms in which good job performance is rewarded through various financial and non-financial incentives, build a distinctive corporate culture that encourages hard work and keeps success stories alive, develop a strong performance management system which holds managers and employees accountable for the behaviour they bring to the workplace, place focus on top-performing employees to reduce their turnover and maintain or increase business performance.

Quality is defined as how well a product does what it is supposed to do – how closely and reliably it satisfies the specifications to which it is built. Managers must be quality conscious and understand the link between high-quality goods and/or services, and competitive advantage (Hellriegel, *et al.,* 2001:67). Thus, the focus of the quality viewpoint is the customer, who ultimately defines quality in the marketplace.

Providing high-quality products is not an end in itself. Successfully offering high-quality goods and services to the customer will typically result in important benefits to the organisation, namely a positive company image, lower costs and higher market share, and decreased product unsuitability.

Total quality has developed to what it is today along with other business management philosophies. It is a diversified way to see the growth of the whole business. TQM posits certain numerical and non-numerical goals for a company. Reaching these goals is typically not easy. It requires support from management, long-term strategic decision making and motivated personnel (Garvin, 1988:319).

The operation process should identify the cost, quality and time that enable the company to deliver a superior product and service to its targeted current customers. To continue to be at the leading edge, the organisation must continually analyze and

systematically improve their business processes measures. Therefore, attention must be given for continuous process improvement to meet the customers' requirements and increase their market share.

Training and development of the employees is required to ensure competent people in the long run. It is important to communicate with everyone in the organisation; empowerment and delegation are largely about giving each employee a sense of responsibility for manufacturing a product or for performing a service to satisfy customers.

5.4.2 Recommendations for future research

Regardless of the limitations of the present study, the findings offer valuable suggestions for future research.

The findings obtained in this study need to be replicated with larger sample groups in order to draw conclusions about the factor-structure of the UWES and TQM in the South African context.

It is recommended that larger samples with a more powerful sampling method be utilised to enable generalisation of the findings to other similar groups in the petrochemical industry. Longitudinal research is recommended to establish levels of engagement and total quality over a period of time.

Participants in different demographic groups experienced different levels of engagement. Possible reasons for this should be established by further research. Evidence suggests that new employees score the highest on levels of engagement, which may in part be due to the optimism and enthusiasm they experience upon starting a new job. Further research is needed to determine exactly which attitudes they possess at this stage and what elements they are so highly engaged with in their work. Once these have been identified, managers can attempt to maintain that high level of engagement employees experience at the beginning of their employment throughout their entire period of employment by understanding clearly what predicts engagement for those individuals.

Future research could also consider individual differences as variables that might predict employee engagement. Several personality variables, such as self-esteem, have been found to be related to the concept of 'burnout'; so this might also be important for engagement, given that engagement is the positive antithesis of burnout.

Another area for future research is to study the potential effect of managerial interventions on employee engagement. There is already some evidence which suggests that exchange-inducing interventions can remind employees of a sense of obligation making them feel obliged to reciprocate (Ganzach *et al.,* 2002:613). Therefore, future research could investigate the extent to which interventions can create a sense of obligation that leads to individuals reciprocating with higher levels of engagement.

The relationship between employee engagement and business success were not extensively quantified in this study. The opportunity exists to build on the findings by developing a model to quantify business success as it relates to employee engagement.

5.5 CHAPTER SUMMARY

In this chapter conclusions regarding the theoretical and empirical objectives were made. The limitations of the research were pointed out and recommendations were made for the organisation in which the study took place, as well as for future research. All theoretical and empirical objectives formulated for this research, have been attained.

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APPENDIX A

Letter of approval from the General Manager of Sasol Wax

CONFIDENTIAL

Direct telephone +27 16 960 3612
Direct facsimile +27 11 522 3288
Email herman.boikanyo@sasol.com
08 June 2012

Sasol Wax
RSA

Dear Kaas de Boer

Re: Request for permission to conduct an Academic Research Study using Sasol Wax (RSA) Employees as partial fulfilment of MBA studies

I am a registered final year MBA student in the Potchefstroom Business School at the North-West University. As partial fulfilment of MBA, I am currently conducting a research project for a dissertation. The title of my research is **'An Exploration of the effect of Employee Engagement on Performance in a petrochemical industry'**.

I hereby request permission to conduct the study using Sasol Wax employees. The research will be done using the attached questionnaires. A random sample of employees will be selected and the questionnaires will be answered **anonymously**. A concerted and conscious effort will be made at all times to keep the results **confidential**. The results will be used purely for **academic purposes**. Please indicate below if permission is granted and attach your signature.

Permission granted:	YES ✓	NO

Signature:

Kaas de Boer
General Manager – Sasol Wax (RSA)

Yours truly
Herman Boikanyo
Sasol Wax R&D

APPENDIX B

UWES and TQM Questionnaires

Completion of the questionnaires to be used in partial fulfillment of the requirements for the degree Masters in Business Administration (MBA) at the Potchefstroom Business School of the North West University

Code number: [ ]

QUESTIONNAIRE:

AN EXPLORATION OF THE EFFECT OF EMPLOYEE ENGAGEMENT ON PERFORMANCE IN A PETROCHEMICAL INDUSTRY

CONTACT DETAILS:

Herman Boikanyo
Cell: 076 855 0461
E-mail: hermanboikanyo@gmail.com

All information will be treated as **STRICTLY CONFIDENTIAL** and will only be used for **ACADEMIC PURPOSES.**

GENERAL INSTRUCTIONS

1. The selected employees are requested to complete these questionnaires.
2. Please answer the questions as objectively and honestly as possible.
3. Please answer all the questions, as this will provide sufficient information to the researcher so that an accurate analysis and interpretation of data can be made.

SECTION A: DEMOGRAPHIC INFORMATION

The following information is needed to help us with the statistical analysis of the data for comparisons among different businesses. All your responses will be treated confidentially. We appreciate your help in providing this important information.

Mark the applicable block with a cross (X). Complete the applicable information.

A1	Gender	Male	Female

A2	Age group	≤ 20	21 - 30	31 - 40	41 - 59	≥ 60

A3	Race	Black	White	Coloured	Indian	Other

A4	Level of Employment	Junior	Middle	Senior	Top

A5	Duration of employment	0 – 2 yrs	3– 5 yrs	6 – 10 yrs	>10 yrs

A6	Qualification	Below Matric	Matric	Diploma / Degree	Postgraduate

Section B: Work and Well-Being Survey (UWES)

The following 17 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the "0" (zero) in the space after the statement. If you have had this feeling, indicate how often you felt it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

		Never	Almost Never	Rarely	Sometimes	Often	Very Often	Always
B1	At my work, I feel bursting with energy.	0	1	2	3	4	5	6
B2	I find the work that I do full of meaning and purpose.	0	1	2	3	4	5	6
B3	Time flies when I am working.	0	1	2	3	4	5	6
B4	At my job, I feel strong and vigorous.	0	1	2	3	4	5	6
B5	I am enthusiastic about my job.	0	1	2	3	4	5	6
B6	When I am working, I forget everything else around me.	0	1	2	3	4	5	6
B7	My job inspires me.	0	1	2	3	4	5	6
B8	When I get up in the morning, I feel like going to work.	0	1	2	3	4	5	6
B9	I feel happy when I am working intensely.	0	1	2	3	4	5	6
B10	I am proud of the work that I do.	0	1	2	3	4	5	6
B11	I am immersed in my work.	0	1	2	3	4	5	6
B12	I can continue working for very long periods at a time.	0	1	2	3	4	5	6
B13	To me, my job is challenging.	0	1	2	3	4	5	6
B14	I get carried away when I am working.	0	1	2	3	4	5	6
B15	At my job, I am very resilient, mentally.	0	1	2	3	4	5	6
B16	It is difficult for me to detach myself from my job.	0	1	2	3	4	5	6
B17	At my work, I always persevere, even when things do not go well.	0	1	2	3	4	5	6

Section C: Total Quality Management Questionnaire (TQM)

All the questions may be answered by making a cross in the relevant block. Use the following key:

1 = Strongly disagree; **2** = Slightly Disagree; **3** = Neutral view; **4** = Slightly Agree, **5** = Strongly agree.

You must select the number which best describes how you feel about the item.

Indicate to what extents do you agree or disagree with the statements. Mark the applicable block with a cross (X).

		Strongly disagree	Slightly Disagree	Neutral view	Slightly agree	Strongly Agree
	TOP MANAGEMENT SUPPORT					
C1	There are clear quality goals identified by top management	1	2	3	4	5
C2	Top management often discusses the importance of quality	1	2	3	4	5
C3	Top level managers view quality as more important than cost	1	2	3	4	5
	CUSTOMER FOCUS					
C4	Customers feedback is used to determine customer requirements	1	2	3	4	5
C5	Customer feedback is used as the basis for measuring quality	1	2	3	4	5
C6	We have a lot of customer complaints related to quality	1	2	3	4	5
	SUPPLIER FOCUS					
C7	Quality and not price is the prime criteria in supplier selection	1	2	3	4	5
C8	Suppliers are treated as customers whose feedback is important in the quest for improvement	1	2	3	4	5
C9	Long term relationship is encouraged with suppliers	1	2	3	4	5
	EMPLOYEE EMPOWERMENT					
C10	My manager trust me in carrying out my actions	1	2	3	4	5
C11	Employees are empowered to take corrective decisions on the spot without looking up to managers for their approval	1	2	3	4	5
C12	I can decide the best way to do my wok	1	2	3	4	5
C13	I have all the required resources to execute my job properly	1	2	3	4	5
	TRAINING AND DEVELOPMENT					
C14	Employees are encouraged to participate in education and training within the company	1	2	3	4	5
C15	Employee training is provided in quality principles	1	2	3	4	5
C16	Senior managers allocate adequate resources towards effort to improve quality	1	2	3	4	5
C17	There are rewards for quality improvements	1	2	3	4	5
C18	Financial incentives are used to reward quality improvements	1	2	3	4	5
C19	Non-financial incentives are used to reward quality improvements	1	2	3	4	5

		Strongly disagree	Slightly Disagree	Neutral view	Slightly agree	Strongly Agree
	TEAMWORK					
C20	There is emphasis on team based problem solving approach rather than individual/department based approach	1	2	3	4	5
C21	People in the work unit share responsibility for the success and failure of their work	1	2	3	4	5
C22	Work decisions are made through consensus	1	2	3	4	5
	PROCESS IMPROVEMENT					
C23	We use statistical control charts to control processes	1	2	3	4	5
C24	We use inspection for quality control	1	2	3	4	5
C25	We have a program to find wasted time and costs in all internal processes	1	2	3	4	5
	COMMUNICATION					
C26	Management provide regular customer/ supplier feedback	1	2	3	4	5
C27	The quality management system contributes to collection and integration of information used for decision making	1	2	3	4	5
C28	The company practices continuous improvement in communication between employees and managers	1	2	3	4	5
	STRATEGY					
C29	Meeting and exceeding customer expectation is accorded a higher strategic priority than short-term production target	1	2	3	4	5
C30	Leaders in the organization try to plan ahead for technological and organisational changes that might affect the future performance	1	2	3	4	5