

Ubuntu Leadership Style Influence on South African Mining Employees'
Engagement

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Abstract

This study explored the impact of Ubuntu leadership on employee engagement within South Africa's mining industry, emphasising values such as respect, empathy, inclusivity, survival, and interconnectedness. Using a descriptive, cross-sectional design, the research examined how Ubuntu leadership addresses industry-specific challenges, including high accident rates, difficult working conditions, and diverse demographic needs. Findings showed a positive correlation between Ubuntu leadership and enhanced employee engagement, suggesting this culturally grounded model fosters a supportive, motivated workforce. Demographic analysis revealed that Ubuntu leadership's impact remains consistent across different age groups, genders, and tenures, reinforcing its versatility in engaging diverse employee groups.

The study further identified safety culture as a key moderating factor, strengthening the link between Ubuntu leadership and engagement in safer work environments. This finding highlighted the importance of integrating strong safety practices with Ubuntu leadership to maximise employee morale and commitment, especially in high-risk settings. These insights offer strategic implications for developing effective leadership models tailored to high-risk industries, contributing to academic literature and practical applications within the South African mining sector. Limitations related to sample diversity were noted, with recommendations for future research to include a broader range of mining commodities to improve generalisability.

Keywords

Ubuntu Leadership, Employee Engagement, Safety Culture, South African Mining Industry, Demographics

Plagiarism Declaration

I declare that this research project is my own original work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. This work has not been submitted previously for any degree or examination at any other university. I further confirm that I have obtained all necessary authorisations and consents to conduct this research.

Mpho Nelwamondo

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1. Chapter 1: Introduction

1.1. Context of the Study

Research studies have shown a strong correlation between leadership styles and employee engagement across sectors. Transformational, authentic, empowering, ethical, and servant leadership styles all positively influence employee engagement, fostering a more motivated and committed workforce (Decuyper & Schaufeli, 2021). The mining industry, especially in South Africa, presents unique challenges due to its hazardous working conditions, which contribute to high rates of accidents and fatalities (Nguyen & Nguyen, 2020). In addition, the sector's socio-political and historical context is marked by gender inequality (Mangaroo-Pillay & Botha, 2020), the exploitation of foreign labour (Onselen, 2021), and involvement in human rights violations (Abrahams, 2021).

Despite the regulatory framework established to ensure safety and environmental sustainability in South African mines (Igbayiloye & Bradlow, 2021), challenges such as environmental degradation, human rights issues, and labour disputes persist (Igbayiloye & Bradlow, 2021). These issues are compounded by the sector's limited progress towards industrialisation and equitable work conditions (Makgetla, 2021). Mining remains crucial to the South African economy, contributing significantly to Gross Domestic Product (GDP) and employment, although its economic importance has declined recently (Makgetla, 2021). The complex legal framework governing the sector and structural weaknesses create a need for leadership that can address financial and human-centred challenges (Renzi, 2021).

Leaders in this sector must maintain employee engagement and motivation while navigating these operational and regulatory hurdles. Effective leadership is critical in fostering a supportive and safe work environment, particularly in high-risk industries like mining (Kotzé & Nel, 2020). While various leadership styles, including transformational and transactional, have demonstrated success in boosting engagement and performance (Decuyper & Schaufeli, 2021; Gameda & Lee, 2020), there is growing recognition that traditional Western leadership models may not fully address the specific needs of the South African mining workforce.

Ubuntu leadership, rooted in African philosophy, offers an alternative approach by emphasising community, empathy, and collaboration (Nwozaku, 2023). Research has shown that Ubuntu leadership principles are closely aligned with the needs of

employees in the South African context, with recent studies finding that Ubuntu leadership is a significant predictor of employee engagement (Chetty & Price, 2024). This leadership style resonates deeply with cultural values, promoting employee engagement, organisational performance, and well-being (Laloo, 2022).

Although substantial evidence supports the effectiveness of various leadership styles in improving employee engagement and addressing workplace hazards, there remains a gap in understanding the full impact of Ubuntu leadership within the specific context of the South African mining industry. This study seeks to fill that gap by investigating how Ubuntu leadership can address the mining sector's challenges, including demanding working conditions and complex socio-cultural dynamics.

1.2. Problem Statement

The South African mining industry faces many persistent and systemic challenges, significantly impacting employee well-being, productivity, and safety standards (Pelders et al., 2021). Despite a comprehensive regulatory framework promoting safety and safeguarding labour rights, issues like gender inequality, labour exploitation, and environmental degradation remain prevalent (Lane et al., 2015). These challenges indicate the limitations of existing leadership approaches, which have struggled to engage employees and create a safer, more equitable workplace. Furthermore, high rates of accidents and fatalities in the industry underscore the urgent need for innovative leadership models to transform workplace conditions (Nguyen & Nguyen, 2020).

The industry's challenges are further compounded by high employee turnover, frequent safety incidents, and productivity fluctuations, highlighting an environment where traditional leadership models may be insufficient. Recent data reveals a turnover rate of approximately 15% annually within the mining sector, with nearly 40% of new hires leaving within the first two years, often due to high job stress and inadequate leadership support (Mining Council of South Africa, 2023). Such turnover raises recruitment and training costs and impacts workforce morale, making it essential for companies to adopt leadership practices that enhance employee retention and engagement.

Safety remains a critical issue, with approximately 80 safety-related incidents reported per 1,000 employees annually, with some mines seeing up to a 30% increase in incidents linked to lapses in safety protocol adherence (Department of

Mineral Resources and Energy, 2022). These incidents threaten worker safety and disrupt productivity, resulting in substantial operational delays and compensation costs. In response, Ubuntu-inspired leadership, emphasising collective responsibility and communal well-being, could create a culture of mutual accountability. Such an approach encourages employees to uphold safety standards actively, potentially reducing incident rates and associated operational expenses.

The productivity challenges tied to disengagement further underscore the need for a practical, culturally resonant leadership approach. Current statistics show that productivity in South African mines lags behind global counterparts due to low engagement, which affects teamwork and operational standards adherence (Statistics South Africa, 2022). With only 55% of mining employees expressing strong engagement in roles, the sector is estimated to have a 20% productivity gap compared to international benchmarks. Ubuntu leadership could bridge this gap by fostering a sense of belonging and shared purpose, thereby unlocking the sector's productivity potential.

Emerging research suggests that Ubuntu's principles, centred on compassion, empathy, and collective well-being, could address the industry's employee engagement and safety challenges in a culturally resonant way (Molose et al., 2018). Studies have indicated that transformational and authentic leadership styles align closely with Ubuntu values and could improve employee engagement in high-risk environments such as mining (Towsen et al., 2020). By creating a sense of belonging and purpose among employees, these leadership styles can play a vital role in maintaining engagement and reducing risks in demanding settings.

Ubuntu has also been recognised as a mediating factor between social resources and employee engagement, especially in non-Western contexts (Tauetsile, 2021). This highlights its potential to bridge the gap between organisational resources and employee needs, enhancing engagement and productivity. Additionally, spiritual leadership models incorporating Ubuntu principles have been associated with improved employee welfare and reduced turnover in South African organisations (Sibanda & Grobler, 2023). By promoting empathy, community, and collective well-being, the mining sector could evolve into a safer, more supportive environment for its workforce.

Adopting Ubuntu-inspired leadership strategies offers a promising path forward for the South African mining industry, sustainably enhancing employee engagement, safety, and productivity (Marais, 2017). Such an approach addresses the industry's urgent challenges and lays the groundwork for a more motivated and committed workforce, essential for the sector's long-term resilience and success.

1.3. Significance of the Study

The significance of this study lies in its potential to introduce a culturally relevant leadership framework, Ubuntu leadership, that addresses the unique challenges of employee engagement, safety, and well-being within the South African mining sector. Although previous studies have shown that Ubuntu leadership can strengthen the connection between social resources and work attitudes to improve engagement (Tauetsile, 2021), this study fills a notable gap in the literature. Leadership research has historically concentrated on Western models, such as transformational and authentic leadership, which may lack resonance with the socio-cultural complexities of the South African mining context (Towsen et al., 2020). By focusing on Ubuntu leadership, a model deeply rooted in African values and collective well-being, this research offers a culturally tailored alternative to Western leadership paradigms.

While effective in fostering engagement and trust, Western leadership models may fall short in inclusivity and sensitivity to cultural nuances (Scott, 2023). Recent studies highlight the significant influence of societal culture on leadership effectiveness in Africa. Ubuntu, an indigenous African philosophy emphasising collective welfare and humanistic values, is proposed as a context-resonant approach to leadership (Asamoah & Yeboah-Assiamah, 2019). Research suggests that incorporating Ubuntu principles into leadership practices can enhance organisational performance and address African governance challenges (Mangaliso et al., 2021). Therefore, exploring how Ubuntu principles can be embedded in mining leadership practices is essential for effectively addressing workplace conditions.

Although transformational, authentic, and servant leadership styles are known to enhance engagement and performance (Decuypere & Schaufeli, 2021), Ubuntu leadership is particularly relevant in high-risk industries like mining, where strong employee engagement correlates with improved task performance and innovation (Govender & Bussin, 2020). This study aims to extend these insights by examining Ubuntu's leadership within the South African mining industry, thereby contributing theoretically and practically to the study of leadership.

In terms of contribution to the literature, this study addresses a gap by focusing on Ubuntu leadership in high-risk industries. In this setting, existing research is scarce, especially outside Western paradigms. This research provides a novel contribution by positioning Ubuntu leadership as a potentially more suitable approach for high-risk environments where Western-centric models may not fully capture the communal ethos essential for effective leadership. Existing models, which emphasise relationality, collective endeavour, and moral considerations, have shown promise; studies have also explored authentic leadership within South African mining (Towsen et al., 2020) and values-driven leadership development that incorporates African philosophical perspectives (Pérezts et al., 2020). While these approaches suggest potential, challenges persist in addressing the unique demands of African organisational contexts.

Further research is needed to refine and validate leadership models that align with African cultural values and effectively address the continent's socioeconomic challenges (Abebe et al., 2020). This study fills these gaps by focusing on Ubuntu leadership and advances a culturally resonant model that supports collective responsibility and well-being in high-stakes environments.

Furthermore, previous research on Ubuntu leadership has primarily focused on sectors like education and healthcare, where challenges differ significantly from those in the mining industry. In the context of South African mining, where teamwork and strict adherence to safety protocols are crucial, recent studies emphasise the role of leadership and organisational culture in meeting safety and productivity demands. Research has demonstrated the importance of supervisory engagement, accountability, and authentic leadership in fostering safety behaviours and enhancing work engagement (Prinsloo & Hofmeyr, 2022; Towsen et al., 2020).

Ubuntu leadership, deeply rooted in African philosophy, has been proposed as a promising approach to strengthening collective welfare and leadership practices (Asamoah & Yeboah-Assiamah, 2019). Yet, challenges persist in effectively applying leadership models in high-risk healthcare and mining environments (Nene, 2021), with socio-demographic factors shown to impact health and safety outcomes among mine workers (Pelders & Nelson, 2019). This study expands the contextual application of Ubuntu leadership by focusing on South Africa's high-stakes mining industry, addressing calls for culturally relevant research from the Global South. Examining Ubuntu leadership in this unique setting not only broadens the application

of Ubuntu to new contexts but also enriches the global leadership discourse, especially in high-risk environments where shared responsibility and safety are critical.

In conclusion, this study's significance is underscored by the need to improve workplace safety, productivity, and employee well-being in the South African mining industry. Through an exploration of Ubuntu leadership, it contributes both novel insights and practical solutions for industries with unique cultural and operational demands, advancing the understanding of culturally aligned leadership models in high-risk contexts. This research not only enhances Ubuntu leadership theory but also introduces a new paradigm for high-risk industries that are culturally distinct, offering a valuable alternative to traditional Western leadership models.

1.4. Purpose

This study explores Ubuntu leadership's impact on South African mining sector employee engagement. Given the hazardous and high-stress nature of mining, combined with the unique socio-cultural and historical context of South Africa, leadership approaches that promote safety, equity, and well-being are essential. Ubuntu leadership, rooted in African philosophy, offers a communal and empathetic approach that aligns with values of interconnectedness, inclusivity, and mutual respect (Nwozaku, 2023). This leadership style encourages collaboration and trust, making it a potentially transformative approach for addressing the challenges faced by the mining industry (Roberson & Perry, 2021).

This research seeks to address a gap in the literature by investigating the effectiveness of Ubuntu leadership in a non-Western context, particularly within high-risk environments like South African mines. While transformational leadership has been linked to positive outcomes such as work engagement and organisational commitment (Decuyper & Schaufeli, 2021; Jiatong et al., 2022), this research focuses on the added value Ubuntu leadership may provide in fostering similar outcomes within the mining sector.

This study will explore the role of safety culture and employee demographics as potential mediators or moderators in the relationship between leadership and engagement. Doing so offers a comprehensive view of leadership effectiveness in culturally diverse and high-risk settings. Ultimately, this research aims to inform leadership development initiatives and organisational policies within the mining

industry by offering practical recommendations to enhance employee engagement, safety, and productivity (Kotzé & Nel, 2020). The findings are expected to contribute to theoretical knowledge and the practical application of Ubuntu leadership, advancing the sustainability and success of the South African mining sector.

1.5. Delimitations

The study will exclusively examine the influence of Ubuntu leadership on employee engagement, deliberately excluding other leadership styles and industries from its scope. The study will aim to expand the understanding of leadership in a high-risk environment with a rich socio-historical background, as highlighted by scholars such as Tauetsile (2021) and Roberson & Perry (2021). By narrowing the focus to Ubuntu leadership, the research will aim to provide a detailed and culturally relevant understanding of how this leadership style impacts employee engagement in a high-risk and historically complex environment.

In addition, demographic factors such as age, gender, and tenure will be treated as control variables, but these will not serve as the primary focus of the analysis. The study will also include safety culture as a moderating factor, following research by Govender & Bussin (2020). However, it will be explored solely about its influence on the relationship between Ubuntu leadership and employee engagement rather than as an independent variable.

A quantitative approach will be adopted, excluding qualitative insights that could offer a broader, more nuanced understanding of leadership impacts, as recommended by Fisher (2021). This focus on quantitative analysis will allow for measurable outcomes and statistically significant findings. By establishing these boundaries, focusing solely on Ubuntu leadership, treating demographic factors as secondary, examining safety culture in a limited context, and restricting the methodology to quantitative analysis, the study will aim to provide a clear, relevant, and focused contribution to understanding leadership effectiveness within the South African mining sector, echoing calls for culturally sensitive leadership approaches as noted by Scott (2023).

1.6. Definition of Terms

Ubuntu Leadership: Ubuntu leadership is a philosophy rooted in African culture, emphasising communal values, interconnectedness, and mutual respect. It is guided by the principle of "I am because we are," which focuses on collective well-being and shared responsibilities (Nwozaku, 2023).

Employee Engagement: Employee engagement refers to the commitment, enthusiasm, and dedication of employees toward work and the organisation, it encompasses emotional investment, job satisfaction, and the willingness to go above and beyond in one's role (Towsen et al., 2020; Decuyper & Schaufeli, 2021).

Vigour: Vigour is a dimension of employee engagement characterised by high energy levels, resilience, and the ability to maintain focus and effort in the workplace (Decuyper & Schaufeli, 2021).

Dedication: Dedication refers to an employee's commitment and substantial involvement in work, including persistence, enthusiasm, and a sense of purpose (Decuyper & Schaufeli, 2021).

Absorption: Absorption is the degree to which employees are entirely concentrated and immersed in work, often leading to a loss of time due to deep engagement (Decuyper & Schaufeli, 2021).

Safety Culture: Safety culture refers to the shared values, beliefs, and practices within an organisation that prioritise and promote safety and health standards among employees (Kotzé & Nel, 2020).

Productivity: Productivity measures the efficiency and effectiveness of employees performing job tasks and contributing to the organisation's goals (Govender & Bussin, 2020).

Employee Retention: Employee retention is the ability of an organisation to keep its employees over time and reduce turnover rates through strategies that ensure job satisfaction and loyalty (Sibanda & Grobler, 2023).

Demographic Factors: Demographic factors refer to the characteristics of employees, such as age, gender, job role, and tenure, that can influence engagement levels and perceptions (Towsen et al., 2020).

1.7. Assumptions

Existence of a Relationship: It is assumed that a relationship exists between Ubuntu leadership and employee engagement within the South African mining industry. This study is based on the belief that Ubuntu's leadership principles, emphasising empathy, inclusivity, and respect, can influence various dimensions of employee engagement. Research by Molose et al. (2018) and Tauetsile (2021) supports this

assumption, showing that Ubuntu principles enhance commitment and team effectiveness in organisational settings, which makes this a reasonable foundational assumption for the study.

Impact of Leadership Principles: It is assumed that specific elements of Ubuntu leadership, such as survival, empathy, inclusivity, respect, and interconnectedness, have distinct and measurable effects on employee engagement. This includes influence on safety culture, productivity, and employee retention. Nwozaku (2023) and Roberson & Perry (2021) highlight that Ubuntu leadership can impact employee behaviour and workplace outcomes by fostering collaboration and mutual respect. This assumption is grounded in the belief that these leadership traits will have an observable influence within the mining industry, particularly in high-stress environments.

Validity of Measurement Instruments: It is assumed that the measurement instruments, such as survey questionnaires, will accurately and reliably capture the variables being investigated, including Ubuntu leadership principles and dimensions of employee engagement. The study will use instruments validated in prior Ubuntu leadership research by Muller et al. (2019) and the UWES instrument by Schaufeli et al. (2006), which have been validated and will be used for measuring employee engagement dimensions. The assumption is that these tools have the necessary reliability and validity to deliver accurate insights.

Representative Sampling: It is assumed that the sample of mining employees selected for the study will represent the broader population in the South African mining industry. This is critical for ensuring the study's findings can be generalised to the industry. While no specific references address the representativeness directly, this assumption is fundamental in ensuring that the conclusions drawn reflect the larger workforce within the mining sector.

Consistency in Responses: It is assumed that participants will provide honest and consistent responses to the survey questions. This assumption is crucial for the reliability of the study's results, given that employee engagement and leadership perception are subjective. Although studies do not directly address this point, it is a standard assumption in survey-based research to anticipate truthful responses.

Current Context: The South African mining industry's socio-economic and organisational context is assumed to remain stable during the research period. The

study relies on the belief that the conditions within the mining sector, such as operational challenges and leadership approaches, will not undergo significant shifts that could distort the findings (Nguyen & Nguyen, 2020). This assumption allows the study to focus on leadership's long-term effects without being disrupted by external changes.

Ubuntu Leadership Relevance: Ubuntu leadership principles are assumed to be relevant and applicable to the South African mining industry. This assumption is supported by studies like Nwozaku (2023) and Roberson & Perry (2021), which demonstrate that Ubuntu leadership aligns with African values and offers a culturally relevant framework for employee engagement and leadership effectiveness. The study presumes that these principles can be integrated into the existing organisational structures and practices within the mining sector to yield meaningful results.

2. Chapter 2: Theory and Literature Review

2.1. Introduction

The South African mining industry faces complex challenges, including employee disengagement and unrest (Marais, 2017). This literature review delves into the critical role of employee engagement in enhancing productivity, safety, and organisational success within this high-risk sector. The dimensions of vigour, dedication, and absorption are essential components of engagement, with research indicating a significant impact on individual and organisational performance (Prinsloo & Hofmeyer, 2022; Govender & Bussin, 2020). Given the industry's unique socio-economic and technological challenges, fostering high employee engagement is essential for ensuring safety, reducing turnover, and increasing operational efficiency (Balogun et al., 2020; Quansah et al., 2023).

A pivotal aspect of this review is exploring Ubuntu leadership and its influence on employee engagement in the South African mining context. Ubuntu leadership, rooted in African philosophy, emphasises communalism, empathy, and interconnectedness, offering a culturally resonant approach to leadership (Nwozaku, 2023). Studies have shown that Ubuntu leadership principles, such as empathy and inclusivity, can significantly enhance work engagement and employee welfare (Towsen et al., 2020; Sibanda & Grobler, 2023).

The study considers the contextual relevance of safety culture and demographic diversity in the mining industry. The interplay between safety culture, leadership, and employee engagement is crucial, as a positive safety culture can moderate the relationship between leadership practices and engagement outcomes (Prinsloo & Hofmeyr, 2022). Additionally, the diverse socio-demographic characteristics of the mining workforce, including age, gender, and work experience, are examined as control variables to provide more precise insights into leadership effectiveness (Donkor et al., 2023). This literature review comprehensively explains how leadership and engagement strategies can be optimised to foster a safer and more productive work environment in the South African mining industry.

2.2. Overview of the South African Mining Industry

South Africa's mining industry is vital to its economy, contributing significantly to its Gross Domestic Product (GDP), exports, and employment (Ericsson & Löf, 2019). This sector is highly diverse, with several commodities shaping the landscape of mining activities and labour dynamics. The industry is mainly known to produce Platinum Group Metals (PGMs), which include platinum, palladium, and rhodium, and this sector alone accounts for approximately 39.5% of the mining workforce (Minerals Council South Africa, 2023). The significance of PGMs extends beyond local economies to impact international markets, underscoring a critical role in employment generation and economic sustainability. Similarly, coal mining continues to play a vital role in South Africa's economy, employing around 17% of the mining workforce and serving as a crucial resource for domestic energy needs and global exports (Minerals Council South Africa, 2023).

Despite experiencing a reduced output, gold mining remains a central pillar of the industry, contributing around 13% to the total mining workforce. Historically known for its rich gold deposits, South Africa still relies on this sector for employment, particularly in regions with a long-standing tradition of gold extraction (Minerals Council South Africa, 2023). Iron ore, an essential export commodity, also plays a significant role in the country's mining industry, employing about 8% of the workforce, primarily concentrated in the Northern Cape (Minerals Council South Africa, 2023). The iron ore industry benefits from strong global demand for steel, making it a strategic player in South Africa's export economy.

Other essential commodities in the South African mining landscape include manganese, chrome, and diamonds. With its critical role in steel production,

Manganese employs around 5% of the mining workforce, while chrome mining accounts for about 4.6% (Minerals Council South Africa, 2023). Although diamonds no longer dominate the sector as they once did, they still contribute approximately 3% to mining employment. South Africa's reputation as a leading producer of precious gems continues to hold significant cultural and economic value, especially in specific regions known for diamond extraction.

Lastly, copper, nickel, and other minerals like zinc and rare earth elements further diversify the country's mining sector. Although smaller in scale, copper mining employs about 2% of the workforce, while nickel mining contributes around 1.5% (Minerals Council South Africa, 2023). The remaining share of employment in the mining industry is attributed to other minerals, highlighting the broad range of resources mined in South Africa.

Safety remains a critical concern in the mining sector, given the hazardous nature of mining operations. South Africa's mining industry has a history of high accident rates and fatalities, which has led to stringent safety regulations and practices (Nguyen & Nguyen, 2020). The industry has made significant strides in improving safety standards, but challenges persist, including compliance with safety protocols and addressing the psychological well-being of workers (Opoku et al., 2020). Therefore, ongoing efforts to enhance safety and well-being are crucial for the sustainability and future success of the sector.

Labour relations in South Africa's mining industry are complex and shaped by historical factors and socioeconomic dynamics. The legacy of apartheid continues to impact labour practices (Francis, 2021). The migrant labour system, a vital industry feature, has been used to perpetuate worker dependence on mines (Glover & Money, 2021). Workers' rights, unionisation, and labour disputes are vital issues, with ongoing efforts to improve working conditions, wages, and labour relations (Pillay & Botha, 2020). The industry faces the challenge of balancing worker welfare with operational efficiency and productivity. Consequently, fostering sustainable and equitable labour relations remains critical for the industry's stability and progress.

The mining industry in South Africa plays a significant role in the country's economy but faces complex socio-economic challenges. While mining operations provide employment opportunities and contribute to local development (Dikgwatlhe & Mulenga, 2023), they also exacerbate existing inequalities and social vulnerabilities

(Cole & Broadhurst, 2022). The industry's impact on local communities, including issues related to land rights, environmental sustainability, and community development, is a significant concern (Abrahams, 2021). Addressing these challenges is essential for ensuring that the benefits of mining are equitably shared and that the industry operates socially responsibly.

Employee engagement is crucial in the mining industry, directly impacting safety, productivity, and overall organisational performance. Engaged employees are likelier to adhere to safety protocols, contribute to innovation, and exhibit higher job satisfaction and commitment (Saks & Gruman, 2020). Mining companies are investing in programs and strategies to enhance employee engagement, recognising its importance for operational success and employee retention (Kotzé & Nel, 2020).

2.3. Employee Engagement

Employee engagement has become a central focus in organisational research due to its profound influence on productivity, performance, and overall success (Mewafarosh et al., 2020). Employee engagement is a multidimensional construct encompassing job satisfaction, organisational commitment, motivation, and discretionary effort (Saks & Gruman, 2020). These elements are essential to improving job performance, increasing productivity, and enhancing customer satisfaction (Bulińska-Stangrecka & Iddagoda, 2020).

Research consistently shows a strong link between engaged employees and improved organisational outcomes. For instance, Zeidan & Itani (2020) emphasise that highly engaged employees are likelier to go the extra mile, contributing to business growth and enhanced productivity. This relationship between employee engagement and organisational performance is further reinforced by Yadav (2020), who underscores the critical role of engagement in fostering organisational success. Similarly, Saks & Gruman (2020) highlight the role of employee engagement in promoting a positive organisational culture, which reduces employee turnover, a key concern in industries like mining.

In South Africa, the mining sector faces distinct challenges, such as health and safety risks, socio-demographic changes, and the evolving demands of the Fourth Industrial Revolution (Karolia-Hussain & Fourie, 2021). Research specific to the mining industry has explored the dimensions of vigour, dedication, and absorption as critical components of employee engagement (Prinsloo & Hofmeyer, 2022). These studies

have also examined the influence of organisational culture, the safety climate, and supervisory accountability on shaping safety behaviours, which are directly linked to work engagement. Furthermore, Kotzé & Nel (2020) identify job resources such as organisational respect and employee care as significant factors contributing to work engagement and organisational commitment. These dimensions are particularly relevant in the mining industry, where maintaining high levels of engagement is crucial for productivity, ensuring safety and reducing turnover.

In the South African mining industry context, where safety, productivity, and workforce retention are critical to success, employee engagement emerges as a practical imperative. Research shows that high levels of employee engagement can positively influence operational outcomes, including safety performance (Quansah et al., 2023). Moreover, studies suggest that a positive safety climate enhances job satisfaction while reducing turnover intention (Balogun et al., 2020), further illustrating the importance of employee engagement in the mining sector.

The dimensions of vigour, dedication, and absorption, widely recognised as critical components of employee engagement (Kulikowski, 2019), are essential to understanding how to foster engagement in the mining industry. In addition to these dimensions, productivity and employee retention factors are particularly relevant in this high-risk, demanding industry. Research by Govender & Bussin (2020) supports the idea that engagement, especially in terms of vigour and dedication, positively impacts safety performance and productivity in the mining sector.

In conclusion, exploring employee engagement within the South African mining industry is necessary and critical to addressing the sector's unique challenges. By focusing on the dimensions of engagement most relevant to this context: vigour, dedication, absorption, productivity, and retention, organisations can enhance individual and organisational performance, ensuring a safer and more productive work environment. The literature will further discuss these dimensions.

2.3.1. Vigour

Vigour is a critical dimension of employee engagement, and its importance cannot be overstated. Research consistently underscores its role in driving sustainable performance and work engagement (Tisu et al., 2021). Vigour, a reflection of personal vitality and resilience, enables employees to cope with the demanding conditions of the mining industry (Tkach & Simakhina, 2021). High vigour among

mining employees correlates strongly with adherence to safety protocols, essential in mitigating workplace accidents and fatalities (Opoku et al., 2020). Furthermore, vigour contributes to enhanced productivity, as employees who maintain high energy and focus are better positioned to achieve operational excellence and efficiency (Prusek et al., 2023). Therefore, vigour is pivotal for understanding and improving employee engagement in this high-risk sector.

2.3.2. Dedication

Dedication represents another crucial dimension of employee engagement, characterised by an employee's commitment to work and the organisation. Abidin et al. (2021) highlight that personal energy, positive work culture, and self-realisation are central to fostering dedication. Dedication translates into higher productivity and team effectiveness in the mining industry, where the work environment can be both challenging and rewarding (Turner, 2019). When employees perceive strong organisational support and fairness, commitment and engagement levels rise (Mishra & Upamanyu, 2021). Sinha (2021) emphasises that dedicated employees align more with the company's goals, leading to improved performance and reduced turnover. This dimension is intricately linked to leadership practices that emphasise recognition and career development, aligning with Ubuntu leadership principles of empathy and inclusivity (Adjo et al., 2021). In conclusion, dedication plays a vital role in enhancing employee engagement, particularly in demanding sectors like mining.

2.3.3. Absorption

Absorption, characterised by complete concentration and immersion in work, is a critical engagement component alongside vigour and dedication (Mazzetti et al., 2021). When employees are absorbed, they experience a profound sense of happiness and lose track of time, which fosters innovative problem-solving and sustained attention to detail (Mbhele & de Beer, 2022). This state is facilitated by self-efficacy (Hernández & Viera, 2020) and effective communication (Mbhele & de Beer, 2022). For the mining industry, where precision and safety are paramount, absorption enhances the ability of employees to maintain high safety and quality standards (Yu et al., 2020). Leadership that cultivates a supportive work environment and recognises the interconnectedness of team members can significantly boost absorption and overall engagement (Ngobese et al., 2023). In conclusion, absorption is critical to employee engagement, particularly in industries like mining, where focus and precision are essential.

2.3.4. Productivity and Performance

Engaged employees are more motivated and innovative, contributing significantly to organisational goals (Sinha, 2021). In the South African mining industry, job resources such as respect and care positively influence work engagement and organisational commitment (Kotzé & Nel, 2020). Effective talent management, including opportunities for learning and development, is essential for engaging and retaining employees with specialised skills (Yura & Andreyei, 2022). Engagement strategies that include rewards, recognition, job security, and performance feedback are critical to enhancing productivity and overall performance (Quay & Yusof, 2022). Employee engagement is crucial to productivity and performance, particularly in the South African mining industry.

2.3.5. Employee Retention

High turnover rates present a significant challenge in the mining industry, affecting operational stability and increasing recruitment costs (Mhatre et al., 2020). Engaged employees are more likely to remain with organisations, reducing turnover and associated costs (Saks & Gruman, 2020). Employee engagement is critical in mitigating turnover intention, with factors such as perceived organisational support and fairness playing a significant role (Mishra & Upamanyu, 2021). By focusing on engagement, mining companies can improve retention rates and maintain a stable, skilled workforce, which is essential for long-term success (Yura & Andreyei, 2022). In conclusion, addressing high turnover rates in the mining industry is vital to maintaining operational stability and controlling recruitment costs.

2.3.6. Employee Engagement Conclusion

In conclusion, employee engagement is critical in enhancing productivity and organisational success, especially in high-risk industries like mining. The dimensions of vigour, dedication, and absorption, combined with productivity and retention, significantly impact individual and organisational performance (Prinsloo & Hofmeyer, 2022; Govender & Bussin, 2020). Given the unique challenges of the South African mining sector, including socio-demographic shifts, safety concerns, and technological advancements brought about by the Fourth Industrial Revolution (Karolia-Hussain & Fourie, 2021), fostering high employee engagement is essential. Engaged employees contribute to improved safety, reduced turnover, and increased operational efficiency, thereby helping to ensure the long-term success of mining companies (Balogun et al., 2020; Quansah et al., 2023).

With the foundation of employee engagement established, exploring leadership's role in further enhancing engagement levels becomes essential. Leadership, particularly styles prioritising inclusivity, respect, and empowerment, such as Ubuntu leadership, has fostered more outstanding employee commitment and engagement (Chetty & Price, 2024). The following section will delve into leadership, examining its critical influence on shaping an engaged and motivated workforce in the mining industry.

2.4. Employee Engagement and the Influence of Leadership

Employee engagement has been extensively studied across industries due to its strong correlation with productivity, employee satisfaction, and retention (Saks & Gruman, 2020; Govender & Bussin, 2020). Engaged employees demonstrate higher levels of commitment, which translates into improved performance, safety adherence, and loyalty, which is particularly critical in high-risk environments like mining (Zeidan & Itani, 2020). Key dimensions of engagement, vigour, dedication, and absorption are influenced heavily by leadership approaches (Mewafarosh et al., 2020). Leadership styles that foster trust, inclusivity, and a shared vision tend to elevate engagement levels, as employees are more likely to feel valued and motivated when leaders emphasise well-being and contributions (Yadav, 2020).

In comparing leadership styles, transformational leadership has emerged as a prominent model for promoting engagement by inspiring employees through shared goals and opportunities for growth (Decuyper & Schaufeli, 2021). Transformational leaders, known for motivating employees by fostering a sense of purpose, have been particularly effective in enhancing job performance and commitment in various contexts, including education and healthcare (Mazzetti & Schaufeli, 2022; Jiatong et al., 2022). This approach emphasises a balance between support and accountability, which has proven effective in creating a resilient workforce (Turner, 2019). However, while transformational leadership effectively fosters engagement, it may not address the socio-cultural specificities of high-risk industries in non-Western contexts, as Fisher (2021) noted.

Similarly, authentic leadership has shown success in promoting transparency, psychological empowerment, and trust, critical factors in environments where the workforce must rely on leadership to prioritise safety and well-being (Towsen et al., 2020; Prinsloo & Hofmeyer, 2022). Authentic leaders focus on genuine relationships with employees, fostering a culture of openness that can reduce workplace stress

and enhance engagement in sectors with high-stress demands. Nonetheless, the predominantly individual-centric focus of authentic leadership has limitations in addressing the collectivist ethos found in many African cultures, where community values are integral to employee satisfaction and productivity (Nguyen & Nguyen, 2020).

2.5. Comparative Analysis of Leadership Styles in High-Risk Environments

The applicability of transactional leadership in high-risk industries, such as mining, offers a valuable comparison. Transactional leadership is structured around clear expectations and rewards, which can stabilise settings where adherence to protocols is crucial for safety. Although transactional leadership maintains consistent performance standards, it often lacks the motivation to inspire more profound employee commitment and morale, particularly in environments that demand high emotional and psychological engagement (Ali et al., 2023; Puni et al., 2020). As a result, while transactional leadership can provide immediate compliance, it may fall short in fostering long-term employee loyalty and morale, as Molek et al. (2023) highlighted.

In contrast, Ubuntu leadership presents an approach that merges the advantages of transformational, authentic, and transactional leadership while addressing the unique socio-cultural needs of African contexts (Chetty & Price, 2024; Tauetsile, 2021). Ubuntu leadership is rooted in African values, emphasising communal well-being, empathy, and interconnectedness. This approach aligns with employees' expectations for leaders prioritising collective safety, empathy, and moral responsibility, which are essential in high-stress, interdependent environments like mining (Nwozaku, 2023). Research by Sibanda and Grobler (2023) shows that Ubuntu leadership uniquely contributes to engagement by fostering a shared responsibility among employees, encouraging them to look out for one another in challenging conditions.

2.6. Ubuntu Leadership's Unique Fit in South African Mining

Ubuntu leadership distinguishes itself by directly addressing high-risk sectors' structural and cultural demands in non-Western contexts. Compared to transformational and authentic leadership, Ubuntu leadership resonates with employees' collective identity, strengthening cohesion and encouraging adherence

to safety standards through mutual accountability (Laloo, 2022). It provides a clear framework for achieving engagement and compliance, essential for sectors where safety and productivity are intertwined. For example, Ubuntu's emphasis on empathy enables leaders to foster a sense of trust and collaboration, directly impacting adherence to safety protocols and promoting mental well-being, which is crucial in high-risk environments (Govender & Bussin, 2020; Pelders & Nelson, 2019).

Moreover, Ubuntu's leadership aligns with the cultural expectations of South African mining employees, as it prioritises community and shared purpose over individualistic success, an approach consistent with findings on engagement drivers in African societies (Marais, 2017; Nwozaku, 2023). By embedding cultural values into leadership practices, Ubuntu encourages employees to remain engaged and fosters a resilient, interdependent workforce capable of sustaining motivation even in demanding conditions.

2.7. Ubuntu Leadership

Ubuntu leadership theory, rooted in African culture, prioritises respect, inclusivity, empathy, interconnectedness, and survival, with respect being the most important (Sibanda & Grobler, 2023). This theory is particularly relevant in African settings, where it can be used to understand and enact responsible leadership (Sachikonye & Ramlogan, 2024). It promotes values crucial for community building and contributes to the African Renaissance (Ébalé & Mulemi, 2023).

At its core, Ubuntu leadership promotes inclusive decision-making, respect for diversity, and the well-being of all community members (Nwozaku, 2023). Sewell et al. (2021) emphasise the role of leaders in fostering shared collective interests and strengthening group identity. By integrating these principles, Ubuntu leadership provides a nuanced approach to fostering a positive work environment, improving engagement, and driving organisational success (Elkington, 2020). This literature review will further discuss the five principles of ubuntu leadership and how each of these principles influences employee engagement.

2.7.1. Respect

As a core principle of Ubuntu leadership, respect is beneficial and essential for enhancing employee engagement in the South African mining industry. In an environment where historical injustices and difficult working conditions have long eroded trust, fostering respect is crucial for rebuilding that trust and creating a

supportive and cohesive workplace culture (Muthelo et al., 2022). Acknowledging each worker's inherent worth and dignity is more than a moral imperative; it is a strategic necessity for driving engagement and organisational commitment (Tărchilă, 2020; Kotzé & Nel, 2020).

Research indicates that respect improves work engagement, bolstering employee resilience, satisfaction, and overall well-being (LaGree et al., 2021). Therefore, leadership that promotes respect cultivates a positive workplace culture and lays the foundation for sustained employee engagement and organisational success.

2.7.2. Inclusivity

As one of Ubuntu's leadership principles, inclusivity is also a critical driver of employee engagement in the mining industry. Valuing and involving every organisation member, regardless of background or status, is essential for breaking down barriers that hinder collaboration and innovation (Adjo et al., 2021). In the mining industry, where inclusivity can address long-standing gender inequalities and promote a more diverse workforce, the impact on workplace culture is profound (Vakari et al., 2023; Kagawa, 2020).

Research shows that inclusive leadership fosters a sense of fairness and belonging, significantly enhancing employee performance and sparking innovation (Bhatnagar & Aggarwal, 2022). By cultivating an environment where all employees feel valued and able to contribute meaningfully, inclusive leadership not only boosts engagement but also drives the overall productivity and success of the organisation (Falih Bannay et al., 2020). Thus, embracing inclusivity is not optional but imperative for achieving sustained employee engagement in the mining industry.

2.7.3. Empathy

Empathy, a cornerstone of Ubuntu leadership, drives employee engagement in the mining industry. This leadership trait goes beyond mere understanding; it addresses employees' emotional and psychological needs (Rasmussen, 2020). By fostering trust and enhancing team cohesion, empathetic leaders create a work environment where employees feel supported and valued (Pelders & Nelson, 2019). This supportive atmosphere directly contributes to a more resilient and productive workforce, as leaders who show genuine concern for both personal and professional aspects of employees' lives can significantly boost morale and engagement (Farmanesh & Zargar, 2021).

Furthermore, research by Jonsdottir & Kristinsson (2020) underscores that emotionally intelligent leaders who exhibit empathy are strongly linked to higher levels of employee engagement. Integrating empathy into leadership practices in the mining industry is a critical strategy for enhancing overall workforce performance and commitment.

2.7.4. Interconnectedness

Interconnectedness, a core tenet of Ubuntu leadership, is an abstract concept and a vital strategy for enhancing employee engagement in the mining industry. This principle underscores the profound connections between individuals and reliance on one another, making it especially pertinent in a sector where teamwork and unity are essential for success (Kholopa, 2022). A strong sense of interconnectedness in the high-stakes mining environment can improve safety, boost productivity, and strengthen community ties (Ngobese et al., 2023).

Leaders who actively cultivate this sense of collective identity and mutual support create a work environment where employees feel valued and part of a larger purpose, which enhances collaboration, engagement, and organisational commitment (Pearce et al., 2023). This, in turn, leads to higher levels of engagement, as employees are more likely to invest in an organisation where they feel interconnected with peers and aligned with the company's goals (Vakari et al., 2023). As Nelson (2022) emphasises, interconnectedness and teamwork are pivotal in driving sustained employee engagement and organisational success.

2.7.5. Survival

Survival, a central concept in Ubuntu philosophy, is about endurance and thriving together, particularly in the face of adversity. In the mining industry, where harsh conditions and historical inequities persist, survival is vital for building resilience, ensuring safety, and fostering sustainable practices (Roper & Clarke, 2020). Emphasising survival means actively addressing the sector's challenges by reinforcing collective strength and unity, essential for overcoming obstacles and achieving long-term success (Muthelo et al., 2022).

Focusing on survival isn't just about keeping the organisation afloat; it's about empowering the workforce to thrive together, driving sustained engagement and performance in a demanding environment (Waldner et al., 2023).

2.7.6. Ubuntu Leadership Conclusion

In conclusion, Ubuntu leadership emerges as a transformative solution to improving employee engagement in the South African mining sector. Chetty & Price (2024) found that perceptions of Ubuntu leadership significantly predicted employee engagement. Rooted in African philosophy and culture, Ubuntu leadership emphasises communalism, empathy, and interconnectedness (Nwozaku, 2023). This approach aligns with inclusive leadership principles, which value and leverage differences, foster collaboration, and build trust (Roberson & Perry, 2021).

2.8. Demographics

As this study transitions from examining the impact of Ubuntu leadership on employee engagement, it is crucial to consider the diverse demographics of mining industry employees. The South African mining workforce exhibits diverse socio-demographic characteristics, including age, gender, and work experience (Donkor et al., 2023).

2.8.1. Demographic Factors as a Control Variable

Demographic factors are crucial control variables in this research, particularly in examining the relationship between Ubuntu leadership and employee engagement within the South African mining industry. Leadership styles operate through mediating mechanisms such as work drive (Shkoler & Tziner, 2020) and are influenced by demographic variables (Thanh & Quang, 2022). Djourova et al. (2020) highlight that age and gender can significantly influence how employees perceive leadership, and controlling for these variables clarifies the true impact of leadership styles on engagement. Abasilim et al. (2019) emphasise the importance of considering demographic variables when examining the relationship between leadership styles and employee commitment. Accounting for factors like age, work tenure, job role and gender, this study can ensure that any observed effects on engagement are directly attributable to leadership rather than being confounded by demographic differences.

2.8.2. Age

Age is a critical demographic factor shaping how employees perceive and respond to leadership styles. Research indicates that employee age influences perceptions of and responses to leadership styles. Younger generations prefer transformational and empowering leadership styles, particularly Millennials and Generation Y (Molek et al., 2023). Like “Baby Boomers”, older employees prefer transactional leadership

more (Molek et al., 2023). Age-related differences in leadership perceptions are attributed to socioemotional changes, with older leaders perceived as more communal and relational-oriented (Thrasher et al., 2020).

Treating age as a control variable, studies can more accurately isolate the effects of leadership on engagement without age-related biases. Alam et al. (2022) reported that age significantly influences employee engagement, with older employees generally reporting higher engagement levels. Wang et al. (2019) highlight that follower characteristics, including age, can affect perceptions of leadership behaviours, emphasising the need to control for these variables in leadership studies. This shows the importance of controlling for age in this study.

2.8.3. Race

Race is a critical demographic variable in studies focusing on leadership and employee engagement, particularly in the South African mining sector. This is due to the industry's historical legacy of racial segregation, which continues to affect workplace dynamics today. Despite post-apartheid reforms such as Black Economic Empowerment (BEE) and the push for greater inclusivity, the deep-rooted racial inequalities in leadership roles and working conditions remain prevalent (Macmillan, 2017). These disparities can create an environment where employees of different racial backgrounds experience leadership and engagement differently, leading to varying levels of psychological empowerment and work engagement (Towsen et al., 2020).

Furthermore, overt or implicit racial biases impact leadership effectiveness and employee engagement. As Adams (2019) highlighted, positive leadership approaches focusing on inclusivity and reducing discrimination can foster greater employee well-being. In contrast, failure to address racial dynamics can perpetuate feelings of exclusion, lowering engagement and potentially exacerbating racial tensions within teams. Thus, understanding how race influences leadership and engagement is essential for mining organisations aiming to create more equitable and productive workplaces.

2.8.4. Gender

Research suggests that gender plays a complex role in leadership dynamics and employee responses. Female employees tend to have more positive perceptions of transformational leadership than male employees (Lee & Park, 2020). Gender

congruence between leaders and subordinates can influence leadership effectiveness, with female managers receiving more support from female employees (Hatmaker & Hassan, 2021).

The impact of leadership styles on employee motivation and empowerment can vary based on gender (Jong, 2023). Gameda & Lee (2020) also reported that leadership styles impact work engagement and outcomes differently across genders. Fjendbo (2020) further noted that the relationship between leadership styles and employee motivation may vary by gender, with pecuniary rewards potentially demotivating female employees. This shows the importance of controlling for gender and ensures that the study can focus on leadership's impact without gender-based biases.

2.8.5. Work Tenure

Work tenure influences employee engagement and perceptions of leadership. Kiyak & Bozkurt (2020) reported that work tenure can affect how employees respond to leadership styles, with experienced employees preferring supportive leadership for structured tasks. For this study, controlling for tenure, the study can isolate leadership's true impact on engagement, eliminating the confounding effects of tenure.

2.8.6. Job Role

Employees' job roles influence how employees perceive leadership styles, with frontline workers often prioritising safety and communication, while managerial staff may value strategic vision. Controlling for job roles enables studies to focus on the broader impacts of leadership styles on engagement. Nguyen and Malik (2022) argue that job roles significantly shape leadership perceptions, making it crucial to control them to achieve accurate results in studies of leadership and engagement.

2.9. Safety Culture

Given the significant hazards and high stakes, a robust safety culture is essential in the mining industry (Nguyen & Nguyen, 2020). Safety culture refers to an organisation's collective values, beliefs, and behaviours that promote and prioritise safe working conditions. In the mining sector, developing a strong safety culture is critical for mitigating risks, improving safety performance, and protecting the well-being of employees. Research highlights that vital drivers of safety behaviour include organisational culture, leadership commitment, supervisory engagement, and accountability (Prinsloo & Hofmeyr, 2022). A strong safety culture helps prevent

accidents and injuries and fosters an environment where employees feel valued and protected. This ensures compliance with safety protocols and enhances overall operational effectiveness (Opoku et al., 2020).

Safety culture also encompasses various psychological dimensions, such as employees' perceptions of safety, risk awareness, and hazard recognition, which are critical for shaping behaviour (Ismail et al., 2021). A systems approach that integrates safety culture with risk perception and hazard recognition is necessary for improving safety outcomes (Brown et al., 2022). The role of occupational health practitioners and managers in promoting these safety behaviours is crucial for enhancing compliance and maintaining a safe working environment (Muthelo et al., 2022). Ultimately, cultivating a robust safety culture remains a priority for the mining industry in ensuring the safety and well-being of employees.

A strong safety culture has positively influenced employee engagement and safety performance. Safety culture fosters an environment where employees are more engaged in work, and engaged employees are more likely to adhere to safety protocols and actively participate in safety initiatives (Opoku et al., 2020). Studies have found that safety leadership, a component of safety culture, significantly impacts safety performance, with employee engagement mediating this relationship (Quansah et al., 2023). In organisations with a positive safety culture, employees tend to be more committed to safety standards, which can lead to improved overall safety outcomes (Ye et al., 2020).

Safety culture plays a moderating role in the relationship between Ubuntu leadership and employee engagement. When the safety culture is strong, Ubuntu's leadership principles can more pronouncedly affect employee engagement outcomes (Quansah et al., 2023). A positive safety climate, defined as employees' shared perceptions of the organisation's safety policies and practices, can enhance the impact of leadership on safety performance (Asad et al., 2021). Ubuntu leadership, focusing on communal well-being, can reinforce a safety culture by fostering a sense of collective responsibility and shared values among employees (Tauetsile, 2021).

Conversely, in environments with a weak safety culture, the positive impact of Ubuntu leadership on employee engagement may be diminished. Employees who perceive safety as a low priority may become disengaged, and the leadership's influence on fostering engagement and motivation could be weakened (Mezentseva et al., 2023).

This highlights the importance of maintaining a strong safety culture to maximise the benefits of Ubuntu leadership in enhancing employee engagement, motivation, and safety behaviours.

The South African mining industry is characterised by significant occupational health and safety challenges, including high rates of injuries, fatalities, and occupational diseases (Balfour, 2024). Mining companies have improved safety culture through leadership initiatives, employee engagement programs, and stricter safety protocols (Prinsloo & Hofmeyr, 2022). As a result, there is growing recognition that fostering a safety culture aligned with Ubuntu principles can enhance employee well-being and operational success.

Ubuntu's focus on empathy and interconnectedness encourages employees to look out for each other's safety, which enhances the collective adherence to safety protocols (Govender & Bussin, 2020). This leadership style promotes open communication, empowering employees to voice safety concerns and contribute to solutions. In mining environments, where hazards are often unavoidable, this collective vigilance is essential for maintaining a safe workplace (Balfour, 2024).

A positive safety culture is closely linked to productivity in the mining sector. Employees who feel safe and supported are more likely to be engaged and motivated, which can lead to higher productivity levels (Opoku et al., 2020). By integrating safety culture with Ubuntu leadership, mining companies can foster an environment where employees focus on tasks and peers' well-being, improving safety and operational efficiency.

2.10. Conclusion of literature review

This literature review has explored the intricate relationships between Ubuntu leadership, employee engagement, and safety culture within the South African mining industry. The diverse socio-demographic characteristics of employees play a crucial role in shaping perceptions and responses to leadership styles. Studies highlight those demographic factors, including age, race, gender, work tenure, and job role, are significant control variables that can influence the impact of leadership on employee engagement (Donkor et al., 2023; Thanh & Quang, 2022). Age-related differences indicate varying preferences for leadership styles, with younger employees favouring transformational approaches and older employees preferring transactional leadership (Molek et al., 2023; Thrasher et al., 2020). Additionally, race

continues to affect workplace dynamics in the mining sector, with historical legacies of inequality influencing employee engagement and leadership effectiveness (Macmillan, 2017; Towsen et al., 2020).

The literature emphasises that a strong safety culture is fundamental in mitigating risks and promoting employee well-being in the mining industry (Nguyen & Nguyen, 2020; Prinsloo & Hofmeyr, 2022). Safety culture encompasses the shared values, beliefs, and behaviours prioritising safety, ultimately enhancing compliance with safety protocols and overall operational effectiveness (Opoku et al., 2020). Research indicates that safety leadership is a critical component of this culture, significantly impacting safety performance, with employee engagement as a mediating factor (Quansah et al., 2023). Furthermore, Ubuntu leadership's principles can reinforce safety culture by fostering a sense of collective responsibility among employees, promoting open communication, and encouraging active participation in safety initiatives (Govender & Bussin, 2020; Tauetsile, 2021).

Finally, the interconnectedness of safety culture and productivity underscores the importance of fostering an environment where employees feel safe and supported. This connection suggests that enhancing safety culture, aligned with Ubuntu leadership principles, can improve employee engagement, motivation, and operational efficiency (Opoku et al., 2020; Balfour, 2024). By understanding these dynamics, mining organisations can implement strategies that enhance safety and employee engagement and contribute to a more equitable and productive workplace.

3. Chapter 3: Research Objective and Questions

The primary objective of this study is to investigate the influence of Ubuntu's leadership style on employee engagement among mining workers in South Africa. This will examine how the principles of Ubuntu leadership, respect, inclusivity, empathy, interconnectedness, and survival, affect various dimensions of employee engagement, including vigour, dedication, absorption, productivity, and employee retention (Sibanda & Grobler, 2023). To achieve this objective, the study will aim to answer three research questions.

Research Question 1: Do Ubuntu leadership principles positively influence employee engagement levels in the South African mining industry?

The rationale behind this research question lies in the growing recognition of leadership's role in shaping workplace engagement. Ubuntu leadership, grounded in

African philosophical values such as respect, empathy, and interconnectedness, promotes a collaborative and inclusive work environment. These values align with the unique challenges of the mining industry, where fostering unity and trust is essential for improving safety, productivity, and worker well-being (Ngobese et al., 2023). Studies show that leadership practices emphasising inclusivity and empathy can significantly enhance employee engagement by creating a supportive environment that meets employees' psychological needs (Kyambade et al., 2024).

Given the harsh working conditions and historical inequities in the South African mining industry, Ubuntu leadership may offer a transformative approach to boosting morale and engagement, particularly when employees feel valued and connected (Muthelo et al., 2022). Understanding the impact of Ubuntu leadership on engagement levels can provide critical insights for improving organisational performance and retention in this sector. This research question will directly be linked to the following hypothesis.

H₁: A statistically significant positive relationship exists between Ubuntu leadership principles and South African mining industry employee engagement.

Research Question 2: Does Ubuntu leadership influence employee engagement in the South African mining industry when controlling for demographic factors such as age, gender, tenure, and job role?

This research question is critical for understanding the nuanced impact of leadership practices on employee engagement. This approach allows the study to focus solely on the effect of Ubuntu leadership by accounting for demographic differences, which are known to influence workplace dynamics. For instance, studies indicate that demographic variables like age and gender can shape employees' responses to leadership styles, with older employees often prioritising stability and younger employees seeking growth opportunities (Akey-Torku & Dai, 2020). Similarly, gender differences have been shown to moderate the relationship between leadership and engagement, particularly in male-dominated sectors like mining, where women may face distinct challenges (Bao et al., 2021).

Research question two will be linked directly to the following hypothesis.

H₂: When controlling for demographic factors such as age, gender, tenure, and job role, Ubuntu leadership will have a significant positive effect on employee engagement in the South African mining industry.

Research Question 3: Does safety culture moderate the relationship between Ubuntu leadership and employee engagement in the South African mining industry?

The mining industry is inherently high-risk, making safety culture crucial in shaping employee engagement. Research indicates that solid safety cultures are associated with improved employee engagement and better organisational outcomes (Bautista-Bernal et al., 2024). Focusing on safety in the mining sector, where accidents are frequent, can lead to reduced turnover, fewer accidents, and greater productivity (Clarke, 2013). Exploring safety culture as a moderating variable could reveal how leadership can be more strategically aligned with safety initiatives, offering insights for mining companies seeking to create safer and more engaged workplaces. The findings would be particularly relevant for industries where employee welfare and safety are paramount. This third research question will directly be linked to the following hypothesis.

H₃: Safety culture moderates the relationship between Ubuntu leadership and employee engagement in the South African mining industry, such that the positive effects of Ubuntu leadership on employee engagement are more potent in environments with a high safety culture compared to environments with a low safety culture.

4. Chapter 4: Proposed Research Methodology and Design

4.1. Research Paradigm

The research paradigm chosen for this study was positivism, deemed appropriate due to its focus on objectivity, quantifiable evidence, and scientific methods to explore the relationship between Ubuntu leadership and employee engagement. Positivism was the most suitable research philosophy for this study because of its emphasis on objective reality, empirical testing, and quantifiable data (Maksimović & Evtimov, 2023). This aligned well with the study's goals of measuring and analysing the influence of Ubuntu leadership on employee engagement in the South African mining industry.

Positivism, a research paradigm aligned with the hypothetical deductive model, emphasises objective measurement and causal relationships (Park et al., 2019). It supported quantitative methods and generalisability, making it suitable for studies on leadership and engagement in diverse samples (Kumalo & Schutte, 2024). This

paradigm is endorsed by quantitative methods, such as structured questionnaires and statistical analysis (Park et al., 2019). These were essential for measuring leadership and engagement in a large, diverse sample of mining employees. By following the principles of positivism, the study aimed to produce generalisable and reproducible findings (Alharahsheh & Pius, 2020), ensuring that the conclusions drawn were grounded in observable, measurable phenomena.

The reliance on established scales, such as the Ubuntu Leadership Scale (ULS) and the Utrecht Work Engagement Scale (UWES), further supported the positivist framework, as these tools had been validated in previous research and offered quantifiable data (Schaufeli et al., 2006).

4.2. Research design

The research design chosen for this study was a descriptive, cross-sectional design. This approach was appropriate as it allowed the study to explore and provide a detailed overview of how Ubuntu leadership principles influenced employee engagement within the South African mining industry. Descriptive research was precious for understanding the characteristics and relationships within a specific population, providing a clear framework for identifying patterns and correlations between leadership styles and engagement levels (Lesko et al., 2022).

This study's cross-sectional design enabled data collection at a single point, allowing for concurrent assessment of leadership practices and employee engagement levels. This method was efficient for large populations, such as the mining workforce, and provided insights into existing relationships without requiring longitudinal data (Saunders et al., 2019). Using validated scales, such as the ULS and UWES, the study ensured reliable data collection across various demographic groups, controlling for factors like age, gender, tenure, and job role (Schaufeli et al., 2006).

The descriptive design supported the study's objective of isolating the influence of Ubuntu leadership while controlling for demographic variables. Research has shown that the descriptive design allowed researchers to systematically describe characteristics of phenomena and establish relationships between variables (Albán et al., 2020). This method allowed for the quantification of employee engagement levels, providing clarity on how leadership practices contributed to overall workforce engagement in the mining industry context.

4.2.1. Methodological Approach

The deductive approach was the most appropriate for this research as it allowed the researcher to test pre-existing theories or hypotheses based on general principles and then evaluate them through data collection. The deductive approach was valuable for hypothesis testing, offering a structured and systematic process that enabled the researcher to move from theory to empirical evidence (Grames et al., 2022). This approach aligned well with the aim of the study, which sought to examine the influence of Ubuntu leadership on employee engagement in the South African mining industry.

The process was further enhanced by applying advanced techniques such as machine learning for hypothesis generation, facilitating more in-depth analysis (Ludwig & Mullainathan, 2023). Additionally, this approach allowed for using a branching tree dependence structure to test multiple hypotheses simultaneously, providing comprehensive insights into the relationship between leadership and engagement (Li et al., 2020).

4.2.2. Methodological Choices

The mono-method design was chosen for this study, focusing on quantitative research. Quantitative research was ideal for hypothesis testing, allowing for precise measurement and objective analysis of relationships between variables (Mohajan, 2020). By collecting numerical data, the researcher could accurately measure the influence of Ubuntu leadership on employee engagement. This method also enhanced reliability and replicability, ensuring the findings were generalisable to a broader South African mining industry population. Quantitative methods were highly influential in producing structured data, which was essential for conducting robust statistical analyses that aligned with the deductive approach of the study.

4.2.3. Strategy

Survey research was selected as the primary strategy for data collection. This strategy was well-suited for testing specific hypotheses and measuring variables across a large and diverse sample. It facilitated the collection of standardised data, ensuring that insights into Ubuntu leadership and employee engagement were representative and generalisable (Booker et al., 2021).

Surveys provided an efficient way to collect quantitative data from a broad demographic within the mining industry, allowing the researcher to analyse patterns and relationships among employee engagement levels, leadership practices, and

other variables. Validated tools such as the ULS and UWES supported this strategy by ensuring reliable and consistent data (Schaufeli et al., 2006).

4.2.4. Time Horizon

A cross-sectional time horizon was chosen for its practicality and cost-effectiveness. This approach involved collecting data at a single point, allowing for timely data collection and analysis (Zuleika & Legiran, 2022). Cross-sectional studies were precious for identifying correlations between variables in a large, diverse sample (Bhattacharjee, 2020).

In this study, a cross-sectional approach enabled the researcher to assess the relationship between Ubuntu leadership principles and employee engagement while controlling for demographic factors such as age, gender, tenure, and job role. This method was also efficient for capturing a broad snapshot of employee engagement levels and leadership effectiveness within the mining sector without the time and financial demands of longitudinal research.

4.3. Population and Sample

The target population for this study consisted of mining employees across commodities in South Africa: iron ore, manganese, platinum, Gold, diamond, coal, etc. Including multiple commodities ensured that the study captured various working conditions and leadership dynamics across different mining environments (Booker et al., 2021). Employees at various operational levels, from miners and machine operators to engineers, safety officers, and administrative staff, were included to ensure the study covered a range of roles within the mining industry.

Additionally, the sample included employees from the production, safety, human resources, and maintenance departments, ensuring a holistic view of the workplace environment (Mohajan, 2020). This diverse sample provided valuable insights into how Ubuntu leadership principles influenced employee engagement, particularly specific roles and years of experience.

Supervisors and middle managers were also crucial to this study as they were vital in implementing leadership practices and directly influencing employee engagement. inclusion allowed for a deeper understanding of the relationship between leadership and employee engagement from a top-down and bottom-up perspective. The study aimed to capture employees' perceptions across various experience levels, from

recent hires to seasoned workers, to explore how Ubuntu leadership impacted newly employed and long-standing staff (Reiber et al., 2020).

4.3.1. Unit of Analysis

The unit of analysis in this study was the individual employees within the South African mining industry. This decision was based on the need to understand how Ubuntu's leadership principles, such as respect, inclusivity, empathy, interconnectedness, and survival, influenced employee engagement at the personal level (Barreiro & Treglow, 2020). Employee engagement is an individual construct reflecting personal attitudes, behaviours, and workplace experiences. By focusing on the individual, the study aimed to explore how employees perceived Ubuntu leadership and how these perceptions translated into levels of engagement.

4.3.2. Sampling Method and Size

The study employed snowball sampling to access a diverse demographic within the mining sector, specifically targeting participants familiar with Ubuntu leadership principles. Recruitment began with participants sourced from the researcher's and colleagues' LinkedIn and WhatsApp networks. These initial participants, representing a range of roles such as supervisors, engineers, and operational staff across different mining sectors, were then asked to refer others within the professional networks. By leveraging digital communication, the recruitment process expanded the sample's geographic diversity, thereby enhancing representativeness.

The recruitment strategy was informed by a growing body of literature exploring leadership, recruitment, and social dynamics in African mining contexts and beyond. This research highlighted the value of Ubuntu's philosophy, which emphasises collective well-being and authentic leadership, in fostering better governance and corporate social responsibility (Asamoah & Yeboah-Assiamah, 2019). Related studies examined the links between authentic leadership, psychological empowerment, and work engagement in South African mining settings (Towsen et al., 2020) and the socio-demographic factors affecting health and safety in mining workplaces (Pelders & Nelson, 2019).

While digital recruitment had gained popularity, traditional snowball sampling remained highly effective, especially in accessing niche populations in specialised sectors (Darko et al., 2022). This approach proved valuable in the mining industry, where unique challenges such as stakeholder diversity and technology adoption

barriers impacted innovation diffusion (Gruenhagen & Parker, 2020). Collectively, these studies illuminated the interconnected dynamics of leadership, recruitment, and culture within the African mining context.

To limit sampling bias, the study sought referrals from multiple and diverse sources within participants' professional networks. This effort aimed to achieve a more representative sample, acknowledging that snowball sampling, while beneficial for reaching specialised and hard-to-reach populations, could introduce bias due to its network-based nature. By integrating snowball sampling with digital tools like LinkedIn and WhatsApp, the study broadened its reach across varied job roles, geographic locations, and levels of experience, thus enhancing the diversity of the participant pool.

The rigour of this approach was supported by literature advocating for multi-wave recruitment and broad initial contact points to mitigate bias. Research indicated that combining snowball sampling with platforms such as LinkedIn (Kozłowski et al., 2021) improved participant diversity. Additionally, methodologies like the five-wave sampling technique (Adedeji, 2019) further increased representativeness.

Overall, this structured approach to snowball sampling, with its focus on diversity and bias reduction, provided a rigorous and representative dataset. Through careful participant selection and structured protocols (Cash et al., 2022), the study established a robust foundation for examining the impact of Ubuntu leadership within the mining sector.

4.4. Measurement Instrument

The primary measurement instrument for this study was a structured survey questionnaire designed to measure Ubuntu leadership principles and employee engagement. The ULS and UWES were utilised to develop survey questions for Ubuntu leadership principles and employee engagement. The use of structured questionnaires aligned with the quantitative nature of the study and was suitable for efficiently collecting large amounts of data from diverse employees across the mining sector (Mohajan, 2020). The reliability and validity of the variables measured in quantitative research are crucial, and researchers must ensure that instruments are both reliable and valid (Sürücü & Maşlakçı, 2020). Below is the write-up explaining the two constructs' instruments.

4.4.1. Ubuntu Leadership Principles Measurement

The measuring instrument for this study, based on Muller et al. (2019) Ubuntu Leadership Scale, was tailored to generate survey questions to assist with understanding the principles of Ubuntu leadership perception. The instrument was designed to capture perceptions of Ubuntu's leadership behaviours and the relationship with critical organisational outcomes (Muller et al., 2019).

The survey was structured to measure leadership principles and the impact on workplace dynamics. As shown in Appendix A, Questions 21 to 30 focus on leadership behaviours that reflect the principles of Ubuntu leadership. Respect and Dignity (Question 21: "Management treats all employees with respect, regardless of position") reflects the Ubuntu value of treating others with inherent respect. Inclusivity and Shared Leadership (Question 23: "The company promotes a culture of inclusivity where everyone feels they belong") aligns with Ubuntu's emphasis on community and inclusivity. Empathy and Concern for Well-being (Question 25: "My supervisors/manager show genuine concern for my well-being") captures the essence of Ubuntu leadership's focus on humanness. Teamwork and Collaboration (Question 28: "Teamwork and collaboration are encouraged and valued in my workplace") is directly linked to Ubuntu's emphasis on collective success and interconnectedness.

Each survey question was measured using a Likert-type scale (e.g., Strongly Disagree to Agree Strongly). Likert-type scales are widely used in survey research to measure attitudes and opinions (Krupat, 2021). This format allows respondents to express the level of agreement with statements that reflect Ubuntu's leadership characteristics. The composite scoring was calculated by averaging responses to leadership-related questions (e.g., Questions 21, 23, 25, 26, 28), which assess perceptions of respect, inclusivity, empathy, and interconnectedness.

4.4.2. Employee Engagement Measurement

The UWES will assess employee engagement through vigour, dedication, and absorption. UWES is a widely used instrument to measure work engagement through three dimensions: vigour, dedication, and absorption (Schaufeli et al., 2006). This was reflected in several survey questions, such as: "At my work, I always have a positive energy" (Survey Question 7), "I am enthusiastic about my job" (Survey Question 10), and "Time flies when I am working" (Survey Question 11). These items were rated on a frequency scale ranging from Never to Always, offering insights into

how deeply employees felt engaged in roles. Using the UWES, the study quantified employee engagement and drew connections between leadership practices and the levels of engagement employees experienced in day-to-day work.

4.4.3. Rationale for Choice of Instruments

The use of the ULS and UWES, combined with the safety-focused questions, provided a robust and multi-faceted framework for measuring key constructs in the study. Both instruments were widely used, validated, and recognised for the reliability across different industries, ensuring the accuracy and generalisability of the study's findings (Muller et al., 2019; Schaufeli et al., 2006).

The alignment with research objectives was achieved using the ULS to directly measure leadership behaviours consistent with Ubuntu principles, while the UWES captured employee engagement levels. This facilitated a clear understanding of how these leadership principles influenced engagement. The use of five-point Likert and frequency scales allowed for the collection of quantifiable data, supporting the statistical analysis necessary for testing hypotheses and determining relationships between leadership, engagement, and safety (Joshi et al., 2015). By integrating these tools, the study ensured a detailed and reliable measurement of the influence of Ubuntu leadership on employee engagement in the South African mining industry.

4.5. Data Collection

Data for this research was collected through a Google Forms online survey. The survey was distributed via email and WhatsApp to mining employees working in the South African mines across different commodities. To ensure accessibility, the survey was made compatible with various devices, including desktop, tablet, and mobile. This approach facilitated participation across a wide workforce demographic, regardless of location or device preference.

Clear and concise instructions accompanied the survey, guiding participants on how to complete it. Emphasis was placed on confidentiality and anonymity to encourage honest responses. Given the sensitive nature of workplace perceptions and leadership dynamics, ensuring privacy was essential for obtaining reliable data.

The decision to use online surveys was grounded in the evolving nature of the South African mining workforce, which has experienced a demographic shift towards younger, technologically savvy employees (Maphosa & Morojele, 2013). This shift, driven by the retrenchment of unskilled workers and an increasing emphasis on

education and digital literacy, ensured that most employees were proficient in English and could engage with online tools (Abatan & Maharaj, 2014). These younger workers, equipped with digital skills, were comfortable navigating online platforms, making this data collection method both feasible and effective for the study (Maphosa & Morojele, 2013).

Online surveys have become increasingly popular for research due to the efficiency in reaching large, geographically dispersed populations and streamlining data collection and analysis (Menon & Muraleedharan, 2020). However, online surveys face methodological challenges, including potential biases in sampling and self-selection (Newman et al., 2020). Researchers must address issues such as ensuring data quality, ethical participant engagement, and transparency (Newman et al., 2020). Despite limitations, online surveys can provide valuable insights when traditional data collection methods are impractical (Wardropper et al., 2020).

4.6. Validity, Reliability and Bias

4.6.1. Validity

To establish the validity of the survey, two approaches were implemented. Construct validity was prioritised to ensure that the survey items accurately measured the constructs of Ubuntu leadership and employee engagement. According to Agarwal (2011), construct validity ensures that survey items accurately measure the intended theoretical constructs. This was achieved through a thorough literature review, confirming that the items reflected the theoretical dimensions of these constructs. Hill et al. (2022) reported that thorough literature reviews help confirm that items reflect theoretical dimensions.

4.6.2. Reliability

To ensure the reliability of the survey, internal consistency was assessed using Cronbach's alpha. Cronbach's alpha is a widely used statistical measure to assess the internal consistency reliability of questionnaires (Hajjar, 2018). It indicates how closely related items in a scale are, with values above 0.7 generally considered acceptable (Tavakol & Dennick, 2011). However, very high values (>0.90) may suggest redundant items (Tavakol & Dennick, 2011). This statistic indicates the extent to which items in the questionnaire are related to each other, providing insight into whether they measure the same underlying construct.

4.6.3. Bias Minimisation

To address potential biases in the study, several strategies were implemented. Sampling bias was mitigated by using random sampling methods to select participants, ensuring that the sample represented the broader population. Vomberg & Klarmann (2021) reported that random sampling techniques can mitigate sampling bias, ensuring representative populations. This approach avoided convenience sampling, which can lead to unrepresentative samples.

To reduce response bias, the survey was carefully designed to minimise leading questions and ensure neutrality in wording. Mauceri & Miller (2008) reported that questionnaires should be designed with neutral wording to reduce response bias and avoid leading questions. To tackle social desirability bias, participants were assured of confidentiality. Ried et al. (2021) highlighted that various strategies have been proposed to mitigate this issue, including assuring confidentiality and anonymity. This has helped to reduce the likelihood of respondents providing socially acceptable responses instead of honest ones.

4.7. Data Analysis and Interpretation

To analyse the data and test hypotheses H1, H2, and H3, a structured, system-independent approach was followed. This step-by-step process guided the researcher through organising, analysing, and interpreting the results to address the research questions effectively.

4.7.1. Data Collection and Cleaning

The data cleaning process for this study began after the completion of data collection, where survey responses were gathered via Google Forms. The responses were exported into an Excel file, providing a format allowing thorough review and manipulation within spreadsheet software or a statistical analysis tool. According to Aguilan et al. (2020), spreadsheet software like Excel is commonly used and easy to use for data manipulation and cleaning. This step ensured that the raw data was accessible for further cleaning and preparation for analysis.

Once exported, the next stage focused on defining variables. Au & Murray (2021) reported that variables must be defined, coded, and structured properly to allow for correct analysis. This process involves mapping survey questions to specific variables, checking for errors and missing values, and creating a data dictionary (Au & Murray, 2021). Each survey question was mapped to a specific variable in the dataset, ensuring that data was structured properly. This step was critical to allow

the correct analysis for each question. Variables such as gender, age, and mine's commodity were categorised as categorical, with clear labelling (for example, "1" representing male and "2" representing female).

Likert scale-based responses, which formed a large portion of the survey, were treated as ordinal variables and were assigned corresponding numerical values from 1 to 5. This differentiation between categorical and ordinal variables ensured that the right statistical methods could later be applied during the analysis. Fitzmaurice & Lipsitz (2021) reported that researchers should consider the nature of the data and research questions when choosing between categorical, ordinal, or continuous variable treatments to ensure appropriate statistical methods are applied

Following this, the data cleaning process addressed missing data. Responses that were incomplete or missing significant data were identified and removed to ensure the integrity of the dataset. Woods et al. (2021) reported that one of the strategies for addressing these issues includes systematic approaches to identify and remove low-quality responses or missing data points. Woods et al. (2021) further reported that the rationale for doing this is to avoid any skew in the results caused by incomplete or partial data, which could reduce the overall validity of the findings. Any entries with blank or missing responses in crucial survey sections were removed entirely from the dataset. In cases where only a few answers were missing, these were also deleted to avoid introducing bias or noise into the results.

Finally, a comprehensive review of the cleaned dataset was performed to ensure all errors had been addressed and the dataset was complete and ready for analysis. This review confirmed that there were no duplicate entries, that all data was appropriately categorised as either categorical or ordinal, and that the dataset accurately reflected the respondents' inputs. This cleaning process resulted in a reliable and well-structured dataset that could be used confidently in the subsequent statistical analysis to answer the research questions.

4.7.2. Descriptive Statistics

Descriptive statistics are essential for comprehensively summarising and presenting research data (Kaur et al., 2018). Reporting descriptive statistics is a vital first step in research, enabling researchers to assess populations more effectively and providing a foundation for further statistical analyses (Kaur et al., 2018). They provide an overview of sample characteristics, including demographics and main variables,

which is crucial for understanding the context of research findings (Turner & Houle, 2019).

Understanding the sample started with summarising demographic variables such as age, gender, race, job role, and tenure. This was done by using frequency distributions and percentages to describe how these categories were distributed within the sample. For instance, calculating the distribution of age groups (e.g., Under 25, 25–34, etc.), gender breakdown (Male, Female, etc.), and analysing job roles and experience levels provided a clear demographic overview of the participants.

Next, a descriptive analysis of the main variables was conducted to summarise the responses to key survey items, particularly those measuring Ubuntu leadership and employee engagement. This analysis involved calculating means, medians, and standard deviations to gain insight into the central tendencies and variability of responses. For example, the analysis might have focused on the average response to the statement "At my job, I feel strong and confident" and examined how employee perceptions of Ubuntu leadership were distributed across the sample.

4.7.3. Hypothesis Testing Using Statistical Analysis

Hypothesis testing using statistical analysis was performed to examine the relationships between Ubuntu leadership, employee engagement, and other variables. The first step was correlation analysis for H1, which posited a statistically significant positive relationship between Ubuntu leadership principles and employee engagement. Correlation analysis is a widely used statistical technique to examine relationships between variables in various fields (Wang et al., 2020). Different methods, such as Pearson's and Spearman's coefficients, are employed depending on the nature of the data and research questions (Alsaqr, 2021).

To assess this relationship, a Pearson correlation analysis was conducted to assess the strength and direction of the relationships between Ubuntu leadership and employee engagement. The Pearson correlation coefficient (r) was calculated to determine whether a significant relationship existed between the variables. This initial analysis provided a simple overview of how strongly Ubuntu leadership and employee engagement were associated, with values ranging from -1 (perfect negative correlation) to +1 (perfect positive correlation). The p-value and correlation coefficient (r) were essential statistical measures for assessing the relationship between variables. The p-value indicates the probability of observing the data if no

relationship exists (Hadjipavlou et al., 2021), while r quantifies the strength and direction of the relationship (Alsaqr, 2021).

For H2, which hypothesised that controlling for demographic factors (age, gender, tenure, job role), Ubuntu leadership would still have a significant positive effect on employee engagement, a multiple regression analysis was conducted. Multiple regression is widely used to analyse relationships between dependent and independent variables, including control variables (Etemadi & Khashei, 2021) In this analysis, employee engagement served as the dependent variable, and Ubuntu leadership was the main independent variable, while demographic factors acted as control variables.

Two regression models were employed: Model 1 (without demographic controls); in this model, Ubuntu leadership was entered as the independent variable, and employee engagement was the dependent variable. The goal was to assess the direct influence of Ubuntu leadership on employee engagement. The results included the R-squared value, which represented the proportion of variance in employee engagement explained by Ubuntu leadership.

Model 2 (with demographic controls), in the second model, demographic factors such as age, gender, tenure, job role, and race were added as control variables. This analysis allowed for an understanding of how much the introduction of these control variables changed the relationship between Ubuntu leadership and employee engagement. The model also generated adjusted R-squared values to account for the number of predictors, ensuring a more accurate representation of the model's explanatory power.

The multiple regression equation was used to assess whether Ubuntu leadership significantly predicted engagement even after accounting for these demographic variables. The key statistic was the beta coefficient for Ubuntu leadership; a significant beta would confirm its independent effect on engagement, thus supporting H2. Ziglari (2024) reported that the beta coefficient is a key statistic for interpreting multiple regression analysis results.

Each regression analysis reported the standard error of the estimate, unstandardised coefficients (B), and standardised coefficients (Beta). The significance of the results was determined through t-tests, and the overall model fit was assessed using

ANOVA (Analysis of Variance), which indicated whether the regression model significantly predicted employee engagement.

A mediation analysis was employed for H3, which suggested that the safety culture mediated the relationship between Ubuntu leadership and employee engagement. To explore whether safety culture moderated the relationship between Ubuntu leadership and employee engagement, a moderation analysis was performed. This was done by including an interaction term between Ubuntu leadership and safety culture in the regression model. The interaction term was constructed by multiplying Ubuntu leadership and safety culture scores, and the significance of this interaction was tested to determine whether the impact of Ubuntu leadership on employee engagement was stronger in environments with a high safety culture.

The moderation effect was assessed by examining changes in the R-squared value and the significance of the interaction term. If the interaction term were significant, it would indicate that safety culture alters the strength or direction of the relationship between Ubuntu leadership and employee engagement.

4.7.4. Similarity Test

Over and above the three hypotheses test, it was important to do a test to check if the demographics of the respondents did not skew the data. The data collected showed that there were more responses from one commodity (iron ore) at 80% compared to other commodities within the South African mining industry. To determine whether the responses from the 80% of respondents from iron ore commodity were similar or different from the remaining 20%, an independent samples t-test was conducted. This test aimed to assess if there was a statistically significant difference in the mean responses between the two groups: the majority commodity (80%) and the rest of the commodities. The independent t-test is crucial for comparing differences between two groups (Kelter, 2020).

In conducting the similarity testing between two commodity groups in the mining sector (iron ore and other commodities), the methodology was designed to compare key variables that affect leadership and employee engagement, such as work engagement, productivity, employment retention, Ubuntu leadership principles, and safety culture. The analysis involved two main statistical tests: group statistics and independent t-tests, with the aim of identifying any significant differences between the two groups based on these variables.

The first step in the methodology was to generate group statistics to establish the mean, standard deviation, and standard error for both groups, iron ore and other commodities. A sample size of 285 respondents from the iron ore sector and 66 from other commodities was used for the analysis. Group statistics provided a foundational comparison by showing the average performance for each variable in both groups, enabling an initial assessment of similarities or differences.

Next, an independent t-test was employed to test for statistically significant differences between the mean scores of the two commodity groups. Prior to conducting the t-tests, Levene's Test for Equality of Variances was performed for each variable to assess whether the variances between the two groups were equal, a key assumption for the t-test. Levene's test is widely used to assess the equality of variances across groups, a key assumption for t-tests and ANOVA (Nordstokke et al., 2011).

Based on the results of Levene's Test, the t-test was run under the assumption of either equal or unequal variances, as applicable. The confidence intervals were also calculated to examine further the range within which the true mean differences could fall, with intervals including zero indicating no significant difference. Through this methodological approach, the study was able to determine where significant differences existed, particularly noting that productivity showed a statistically significant difference between the two commodity groups while other variables did not.

4.7.5. Interpretation and Reporting Results

The interpretation and reporting of results for this research study were conducted using a structured approach that emphasised clarity, relevance, and contextualisation of findings related to Ubuntu leadership, employee engagement, and safety culture within the South African mining industry. The methodology included several key steps:

The interpretation of the results was guided by the theoretical framework surrounding Ubuntu leadership and its impact on employee engagement. Each research question was systematically addressed, starting with the descriptive statistics that provided an overview of the sample's demographic characteristics. This framework ensured that the interpretation of findings was anchored in the existing literature on leadership and

engagement, allowing for meaningful insights into how Ubuntu leadership practices influence employee engagement in the mining sector.

Statistical findings were presented clearly and organised, aligned with the research questions outlined in the study. The results section began with descriptive statistics, summarising participants' demographic profiles and key constructs, such as the mean scores for Ubuntu leadership and employee engagement. This was followed by the results of the correlation analysis, which demonstrated a significant positive relationship between Ubuntu leadership and employee engagement. Each statistical output was clearly articulated, and relevant tables and charts were included to enhance visual understanding, making it easier for readers to follow the progression of the analysis.

Following the presentation of results, the interpretation included a thorough discussion of the implications of the findings for both practice and theory. For instance, the significant correlation between Ubuntu leadership and employee engagement indicated that organisations in the mining sector should consider adopting and promoting Ubuntu leadership practices to enhance employee engagement levels. The study's limitations were also acknowledged, such as potential biases in self-reported measures and the limited generalisability due to the purposive sampling method. Recognising these limitations added depth to the interpretation, allowing readers to understand the constraints associated with the conclusions drawn.

The results were compared and integrated with existing literature to contextualise the findings further. For example, the positive relationship between Ubuntu leadership and employee engagement supported previous research emphasising culturally relevant leadership styles in enhancing employee motivation and commitment. The moderation analysis, which showed that safety culture had a slight negative interaction effect, was discussed in relation to existing studies that suggested the complexities of leadership and safety culture interactions. This comparison provided a nuanced understanding of how the current study contributes to the broader discourse on leadership practices in the mining sector.

The interpretation culminated in a concluding synthesis that summarised the key findings and implications for organisational practice. The study emphasised the importance of Ubuntu leadership in fostering employee engagement while

recognising the need for a balanced approach that considers the role of safety culture. By framing the findings within the context of actionable insights, the research aimed to guide practitioners in implementing strategies that leverage Ubuntu leadership principles to enhance engagement and safety within the mining industry.

4.8. Limitations

The primary limitations of this quantitative study included potential sampling biases, measurement challenges, and contextual constraints. While random sampling was employed to enhance the sample's representativeness, there remained a risk of non-response bias. Certain demographic groups, such as younger employees or those in lower-level positions, may have been less likely to participate, resulting in the underrepresentation of these segments. This, in turn, could have skewed the findings, leading to a possible overestimation or underestimation of the actual relationship between Ubuntu leadership practices and employee engagement. Additionally, if the sample did not adequately capture the diversity of the mining workforce, generalisability across the broader industry could be affected.

Measurement challenges were another key limitation. The study relied on self-reported data collected through structured questionnaires, which carried the risk of social desirability bias. Participants might have responded in ways that reflected perceived expectations rather than genuine perceptions of Ubuntu leadership and its impact on the engagement. Moreover, capturing the full complexity of constructs such as Ubuntu leadership and employee engagement using standardised survey instruments could have been difficult, potentially limiting the accuracy and depth of the results. The measurement tools' validity had to be carefully considered to ensure they accurately reflected the variables being studied.

Contextual constraints inherent to the South African mining industry also posed limitations. The sector is subject to external influences, including economic fluctuations, regulatory changes, and varying organisational cultures across different mining companies. These factors may have affected employee engagement independently of leadership practices, potentially confounding the relationship between Ubuntu leadership and engagement. Additionally, unique cultural factors, such as South Africa's historical context and socioeconomic conditions, may have influenced how Ubuntu leadership principles were interpreted and implemented in practice, complicating the analysis.

In summary, although this quantitative study provided valuable insights into the relationship between Ubuntu leadership and employee engagement, these limitations needed to be acknowledged to strengthen the credibility and applicability of the findings.

4.9. Ethical Considerations

In the study, several key ethical considerations were addressed. First, participants were provided with information about the purpose and scope of the study, ensuring respondents understood any potential risks or benefits before conducting the survey. Participation was entirely voluntary, and participants were made aware that they could withdraw from the study at any point without any repercussions.

Confidentiality and anonymity were prioritised throughout the research process. The researchers ensured that personal data, responses, and participant identities were kept private and protected. All data collected was anonymised to prevent the identification of individual participants. Additionally, efforts were made to avoid any form of coercion, especially given the hierarchical nature of the mining industry.

Special care was taken to avoid harming participants. Sensitive topics like leadership, workplace safety, and engagement were respected. Transparency and honesty were maintained by clearly communicating the study's objectives and how the data would be used.

Cultural sensitivity was another critical ethical consideration, especially as the study centred on Ubuntu leadership, a concept deeply rooted in African culture. The researcher ensured that the cultural significance of Ubuntu was respected throughout the study. Finally, strict data security measures were implemented to ensure the integrity of the information collected. Data was securely stored and only accessible to authorised personnel in compliance with relevant data protection laws such as South Africa's Protection of Personal Information Act (POPIA). These ethical considerations ensured that the research maintained its integrity while safeguarding the rights and well-being of the participants.

5. Chapter 5: Findings

5.1. Introduction

This section presents the study's findings, which aimed to investigate the influence of Ubuntu leadership on employee engagement within the South African mining

industry and the moderating role of safety culture in this relationship. Quantitative data were collected from employees in various mining organisations, and statistical analysis was employed to assess the key variables, including Ubuntu leadership, employee engagement, and safety culture.

The results are organised into six subsections. First, the coding and data preparation work undertaken to clean the data. Second, the sample's demographic characteristics are presented, providing an overview of the participants. Third, the instrument reliability is examined, ensuring the measures' consistency. Fourth, descriptive statistics are provided, highlighting general trends in the data. Fifth, the regression analysis results are presented, addressing the study's main hypotheses concerning the influence of Ubuntu leadership on employee engagement and the moderating effect of safety culture. Finally, a similarity test is conducted to check for differences in responses between participants from the iron ore commodity and compared to those from other parts of the South African mining industry.

These results offer insights into the role of culturally relevant leadership models and organisational safety culture in shaping employee attitudes, behaviours, and engagement levels in high-risk work environments such as the mining industry. The implications of these findings will be discussed in the subsequent section.

5.2. Data Coding and Preparation

In this study, data coding and preparation for the quantitative Likert scale data were carried out systematically to ensure accuracy and consistency, facilitating robust analysis of employee engagement, leadership, and safety culture within the South African mining industry. Likert scale data were coded and prepared systematically to maintain consistency and reliability across responses, a best practice for quantitative analysis (Field, 2018). The following steps describe how the data was coded, cleaned, and prepared for analysis.

The survey employed a 5-point Likert scale to capture respondents' perceptions on various statements related to Ubuntu leadership, employee engagement, and safety culture. The Likert scale ranged from 1 (strongly disagree) to 5 (strongly agree), with the following coding scheme applied to each item:

- Strongly Disagree = 1
- Disagree = 2
- Neutral = 3

- Agree = 4
- Strongly Agree = 5

This coding system was applied uniformly across all statements, ensuring that higher values consistently indicated stronger agreement with positive statements.

The other part of the survey involved engagement questions. This coding scale allowed respondents to indicate the frequency of engagement-related experiences. Higher scores, closer to 5, reflected more frequent and intense positive engagement with work, while lower scores indicated less engagement. This coding system helped quantify subjective experiences of job enthusiasm, purpose, and immersion, which were then analysed to understand the levels of employee engagement in relation to leadership styles and other workplace factors.

- Always = 5
- Often = 4
- Sometimes = 3
- Rarely = 2
- Never = 1

Once the responses were coded, the data were entered into SPSS (Statistical Package for the Social Sciences) for analysis. Each respondent's data was entered in rows, with columns representing each Likert scale statement. Demographic information, such as age, gender, job role, tenure, and mine commodity, was also included in separate columns to facilitate the analysis of demographic variables as potential control variables.

After data entry, a thorough cleaning process was conducted to ensure the accuracy and reliability of the dataset. Any missing responses were identified, and the extent of missing data was assessed. Missing values were addressed through mean imputation (for less than 5% missing data) and listwise deletion for substantial gaps, methods commonly used to enhance data robustness (Schlomer et al., 2010).

Before proceeding with inferential analysis, descriptive statistics were calculated for each Likert item and composite variable. This included measures such as means, medians, standard deviations, and skewness. The descriptive statistics provided a preliminary overview of the data, highlighting central tendencies and potential trends in leadership and engagement across the mining sector. For example, the average employee engagement score was 3.8 (on a 5-point scale), indicating moderately high

engagement levels across the sample. Similarly, Ubuntu leadership behaviours scored an average of 4.1, suggesting that respondents generally perceived leaders as embodying Ubuntu principles.

5.3. Demographics and Sample Size

The sample's demographic characteristics are presented to provide an overview of the participants in the study. Descriptive statistics provide foundational context for the sample, helping identify relevant characteristics that may affect outcomes (Pallant, 2020). These characteristics include key factors such as age, gender, job tenure, and job roles within the South African mining industry. Understanding the demographic profile of the participants is crucial for interpreting the study's findings, as it allows for the identification of trends and patterns that these variables may influence. The demographic results also serve as a foundation for examining the relationships between Ubuntu leadership, employee engagement, and safety culture and any potential moderating effects of these demographic factors on the study's outcomes.

5.3.1. Age

The age distribution of the study's respondents is shown in Figure 1 below. The data presented highlights several trends that are interesting. Firstly, the largest contributions come from 51.7% of participants falling between 35 to 44 years of age. Then again, the second-largest contributions come from 33.6% of participants who fall within the age bracket of 25-34 years. The age brackets of 45 to 54 years old have quite lower percentages of 11.9% and under 25 at 0.85%.

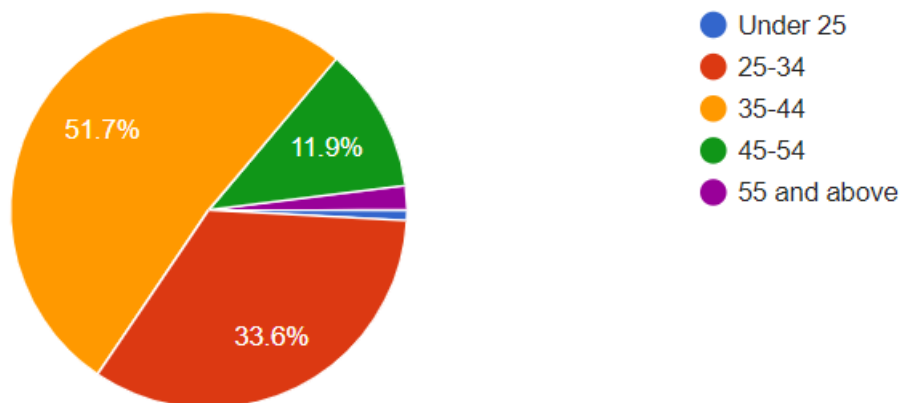


Figure 1: Age demographics (Source: Research questionnaire on Google Forms)

5.3.2. Gender

The chart below, Figure 2, shows the gender distribution of the respondents who answered this survey. From the obtained results, 67.2% identified as male, 32.2% as female, and 0.6% identified themselves as not wanting to disclose gender. This difference in gender distribution is typical of the norm. The overrepresentation observed could reflect broader gender dynamics at play, influencing perceptions in corporate culture and leadership.

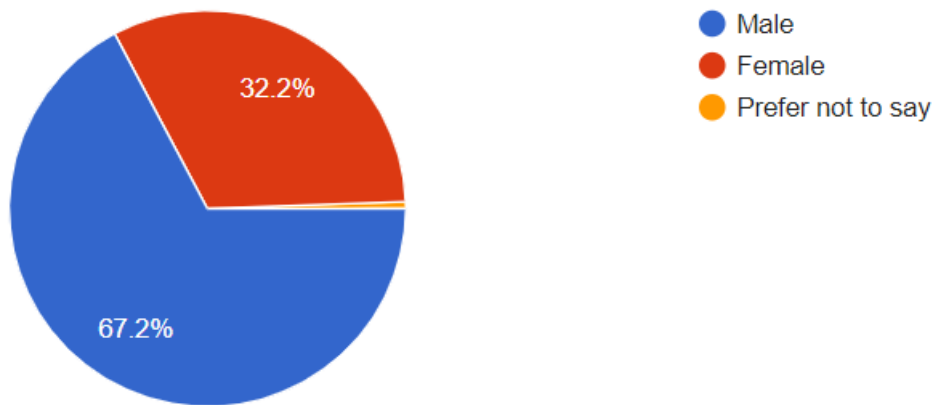


Figure 2: Gender demographics (Source: Research questionnaire on Google Forms)

5.3.3. Race

Figure 3 below shows that Africans made up 73.7% of the workforce in the industry, followed by Coloured with 22%, then White with 4%, and Nama people with 0.3%. The below values reveal that a larger portion of the population in the mining sector is African.

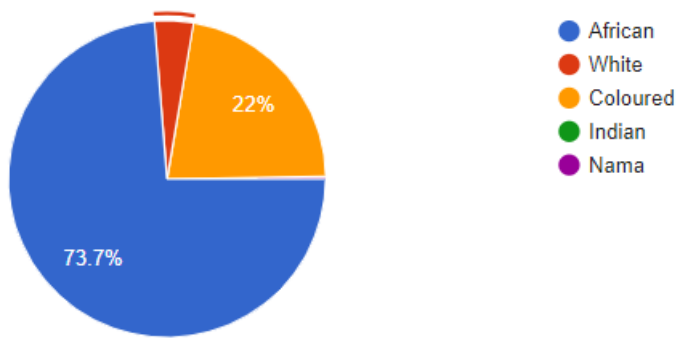


Figure 3: Race demographics (Source: Research questionnaire on Google Forms)

5.3.4. Work Tenure

Figure 4 below shows the number of years the respondents have been in the industry. The results range from less than five years to over thirty years, where the larger proportion of the sample size, 40.7%, ranged from ten to twenty years of experience. The latter were followed by 34.5% of those who had been working in the mining industry for five to ten years. The results also proved that the percentage for those under five years was 17.8%, while between 20 and 30 and over 30 years recorded 6.2% and 0.8%, respectively.

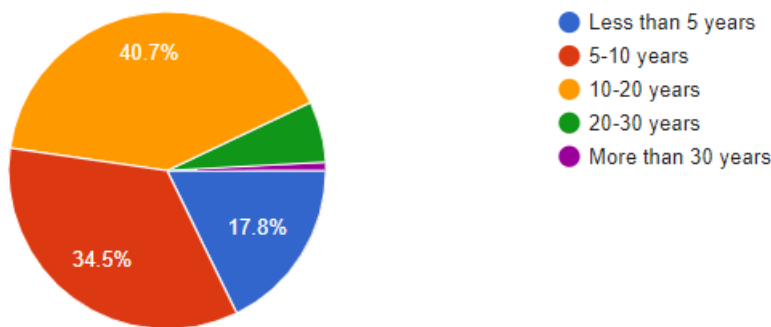


Figure 4: Work tenure demographics (Source: Research questionnaire on Google Forms)

5.3.5. Job Role

Figure 5 gives the distribution of respondents' job roles in the mines. The largest proportion of respondents are operators, general labourers, and assistants, totalling

51.6%. 16.6% of respondents were managers and employees working at the management level. 12.8% were artisans, and 12.0% were supervisors; these are first-line managers for operators. 5.1% were professional employees, including Engineers, HR, all other professions within the mining industry that are working below management level. 1.7% of respondents were graduates. This would accordingly suggest, owing to the division of labour, that a high proportion of the workforce consists of frontline employees and perhaps generally affects the way in which leadership styles are viewed within the company.

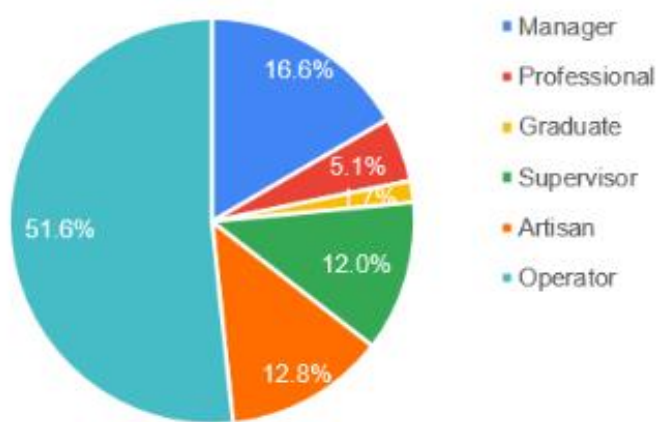


Figure 5: Job role demographics (Source: Researchers' data)

5.3.6. Mine Commodity

The South African mining industry comprises many different commodities. The respondents indicated the commodity of respective mines. Figure 6 below is the distribution of different commodities that the respondents work for Iron ore was the most dominant commodity at 80.2%, followed by coal at 13.1% and platinum at 3.7%. All other commodities, including gold, diamonds, chrome, and manganese, had less than 1% representation in the sample.

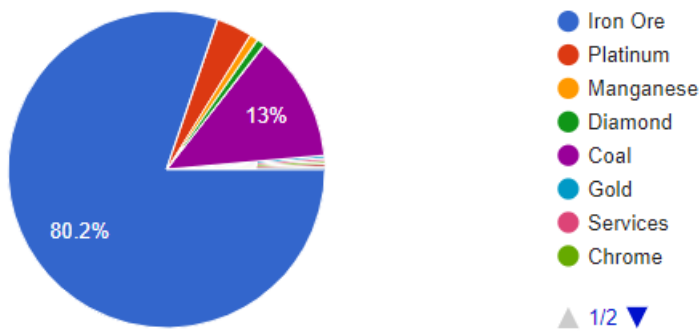


Figure 6: Mine commodity demographics (Source: Research questionnaire on Google Forms)

5.4. Descriptive Statistics

The descriptive statistics provide a detailed overview of the key variables measured in the study, offering insights into the general patterns and trends within the data. These statistics summarise important elements such as the mean, standard deviation, and range for the variables of interest, including Ubuntu leadership, employee engagement, and safety culture. Measures like mean, standard deviation, and skewness highlight central tendencies and distribution shapes, which are foundational for later inferential analyses (Field, 2018). The analysis sets the stage for a deeper exploration of how the variables interact, allowing for a clearer understanding of the dataset's overall distribution and central tendencies. This section helps establish a foundation for interpreting the regression analysis and subsequent findings.

5.4.1. Employee Engagement

The descriptive statistics for employee engagement, measured through the Utrecht Work Engagement Scale, provide valuable insights into employee engagement's vigour, dedication and absorption dimensions within the South African mining industry. Table 1 below shows the full descriptive statistics results.

Table 1: Employee engagement descriptive statistics (Source: IBM® SPSS and Researchers' Data)

Descriptive Statistics								
		N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
		Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Vigour	At my work, I always have positive energy	351	1	5	4.20	.876	-.713	.130
	I feel strong and confident in my job	351	1	5	4.46	.847	-1.515	.130
Dedication	I find my work meaningful and purposeful	351	1	5	4.52	.763	-1.529	.130
	I am enthusiastic about my job.	351	1	5	4.45	.822	-1.395	.130
Absorption	Time seems to fly when I am working.	351	1	5	4.00	1.023	-.677	.130
	I am fully immersed in my work.	351	2	5	4.32	.800	-.807	.130
	Valid N (listwise)	351						

The descriptive statistics presented here offer valuable insights into the distribution and tendencies of the data collected for key employee engagement variables: vigour, dedication, and absorption. These statistics summarise 351 responses to questions measuring positive energy, confidence, enthusiasm, purposefulness, and immersion in work. For instance, the mean scores for vigour (e.g., "I always have positive energy" with a mean of 4.20 and "I feel strong and confident" at 4.46) suggest that employees generally feel energised and confident in roles. Similarly, high mean scores for dedication and absorption (ranging from 4.00 to 4.52) indicate that

employees find work meaningful, are enthusiastic, and often lose track of time due to deep engagement. The skewness values show a negative skew, suggesting a concentration of responses on the higher end of the scale, reflecting positive engagement levels across the sample.

5.4.2. Productivity

The descriptive statistics for productivity-related questions offer insights into how respondents view productivity and efforts at work. The table showing the full results is shown in Appendix B, Table 10. The mean scores for items such as "I am able to meet my productivity targets at work" (mean = 4.40) and "I go above and beyond to improve my productivity" (mean = 4.43) suggest that employees generally perceive themselves as productive and are committed to exceeding expectations. Additionally, the question "I ensure that I ask for all necessary tools and resources" also scored a mean of 4.40, indicating that most respondents proactively seek the resources required to enhance productivity. The negative skewness values indicate that most responses are clustered on the higher end of the scale, reflecting an overall positive sentiment toward productivity among the sample group (Kline, 2023).

5.4.3. Employee Retention

The descriptive statistics for loyalty and retention-related items reveal insights into respondents' feelings of commitment toward the organisation. The table showing the full results is shown in Appendix B, Table 11. The statement "I feel a strong sense of loyalty to my company" had a mean score of 4.14, indicating a generally positive sentiment toward employee loyalty. Additionally, "I see myself working at this company for the next few years" had a slightly lower mean of 3.93, showing a slight drop in long-term commitment. The negative skewness values for both items suggest that most responses were skewed toward higher ratings, reflecting an overall favourable view of loyalty and retention in the workforce, although long-term commitment might be a bit more varied (Schober et al., 2018).

5.4.4. Safety Culture

The descriptive statistics for safety-related items highlight employees' strong commitment to workplace safety protocols. The table showing the full results is shown in Appendix B, Table 12

. The statement "I value safety as my first priority in my workplace" received a high mean score of 4.74, demonstrating a firm prioritisation of safety among the

workforce. Similarly, the items "I voluntarily report any safety concerns" and "I follow safety protocols that are enforced at my job site" had mean scores of 4.46 and 4.59, respectively. These findings indicate that employees value safety and actively engage in safety behaviours. The negative skewness across all items suggests that most responses leaned toward higher values, reinforcing the conclusion that safety is a critical and well-regarded aspect of workplace culture (Kline, 2023).

5.4.5. Ubuntu Leadership Principles

The five Ubuntu leadership principles are presented in the descriptive statistics in Table 13 in Appendix B. The principle of respect is foundational in fostering a healthy work environment. In this study, employees rated the statement "Management treats all employees with respect, regardless of position", with a moderate mean of 3.43. This score highlights that while there is some level of respect across the organisation, improvements could be made to ensure fair treatment of all staff. Respect fosters trust, openness, and a sense of equality, which boosts morale and encourages positive team interactions (Janes et al., 2021). Disrespect or inconsistency in management behaviour can lead to disengagement and resentment.

The statement "The company promotes a culture of inclusivity where everyone feels they belong" received a mean score of 3.76, indicating that most employees perceive the workplace as inclusive. However, there is still room for growth. Inclusivity ensures that all employees are valued and supported regardless of background. Encouraging diverse perspectives and enhancing problem-solving and innovation is critical (Ye et al., 2020). Moreover, a strong culture of inclusivity strengthens the sense of belonging and loyalty to the company, improving retention rates and overall employee satisfaction.

The third principle, "I have equal opportunities for career advancement, regardless of my background," received an average score of 3.77. This suggests that many employees feel that the company provides fair advancement opportunities, though some may still experience barriers. Equal career growth opportunities are essential for maintaining employee motivation and long-term commitment to the organisation. When employees perceive that efforts and achievements are recognised and rewarded fairly, they are more likely to be engaged and productive, contributing to the company's overall success (Opoku et al., 2020).

Regarding empathy, employees rated "My supervisors/manager show genuine concern for my well-being" with a mean of 3.68. While this score indicates that employees feel a moderate level of concern from management, fostering deeper empathy could further enhance employee engagement. Empathetic leadership, particularly in high-risk industries like mining, strengthens employees' psychological safety, enabling them to voice concerns and contribute without fear of judgment (Tauetsile, 2021). Ubuntu leadership, which emphasises interconnectedness and mutual respect, aligns well with this principle, reinforcing emotional support and staff well-being.

The highest score in this set, 4.15, was for the statement, "Teamwork and collaboration are encouraged and valued in my workplace." This score underscores the strong emphasis on teamwork within the company, suggesting that employees view collaboration as a key part of work culture. Effective teamwork enhances productivity and innovation by combining various skills, ideas, and perspectives. In mining, where safety and efficiency are paramount, a culture that values collaboration ensures that tasks are completed efficiently, risks are minimised, and shared goals are achieved (Mezentseva et al., 2023).

5.5. Instrument Reliability

The reliability statistics for the various constructs in the study provide valuable insights into the internal consistency of the scales used to measure each variable. Table 2 below are the results for each variable. Cronbach's Alpha values above 0.7 are deemed acceptable, indicating reliable constructs (Tavakol & Dennick, 2011).

Table 2: Instruments reliability test results (Source: IBM® SPSS and Researchers' Data)

Reliability Statistics			
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
Employee engagement	0.832	0.790	6
Productivity	0.673	0.658	3
Employment Retention	0.757	0.645	2
Ubuntu Leadership Principles	0.916	0.894	10
Safety Culture	0.786	0.712	3

With employee engagement with a Cronbach's Alpha of 0.832, the employee engagement scale demonstrates strong internal consistency, indicating that the six items included effectively measure the concept of employee engagement. This aligns with research indicating that reliable measurement of engagement is crucial for understanding its impact on performance and retention (Quansah et al., 2023; Ismail et al., 2021).

The Productivity scale has a Cronbach's Alpha of 0.673, which suggests a moderate level of internal consistency with three items. While this level of reliability is acceptable, it may warrant further examination to ensure that all aspects of productivity are adequately captured. A higher reliability coefficient is often preferred in studies focusing on productivity to ensure robust conclusions (Janes et al., 2021).

The Employment Retention scale shows a Cronbach's Alpha of 0.757 with two items, indicating satisfactory reliability. This level suggests that the scale is reasonably consistent in measuring employee retention. Employee retention is critical in the mining sector, where turnover can significantly impact safety and operational efficiency (Prinsloo & Hofmeyr, 2022).

The Ubuntu Leadership Principles scale boasts a high Cronbach's Alpha of 0.916, reflecting excellent internal consistency among the ten items. This strong reliability supports the use of this scale in measuring the nuanced dimensions of Ubuntu leadership, which is characterised by empathy, respect, and interconnectedness (Tauetsile, 2021). High reliability in this construct is essential for accurately assessing the impact of Ubuntu leadership on employee engagement and safety culture.

Lastly, the Safety Culture scale has a Cronbach's Alpha of 0.786 based on three items, indicating good reliability. A robust safety culture is fundamental in high-risk industries such as mining, where employee perceptions of safety can significantly influence engagement and performance (Nguyen & Nguyen, 2020; Brown et al., 2022).

In conclusion, the reliability statistics reveal strong to moderate internal consistency across the different constructs measured in the study. Employee engagement and Ubuntu leadership principles displayed high reliability, which is essential for accurately assessing these multi-item constructs (Pallant, 2020). High reliability in constructs like Employee engagement and Ubuntu leadership principles underscores the importance of these dimensions in driving employee outcomes in the mining sector. These findings highlight the need for continued research into the relationships between these variables to enhance safety, productivity, and overall employee well-being.

5.6. Hypothesis Testing

In this section, the results of the hypothesis testing will be presented to address the research questions regarding the influence of Ubuntu leadership on employee engagement, the moderating role of safety culture, and the differences in employee perceptions across demographic groups within the South African mining industry.

The analysis will begin by reporting the findings related to the first research question, examining the direct influence of Ubuntu leadership on employee engagement. Following this, the results pertaining to the second research question will be detailed, focusing on the demographics being the control variable in this relationship. Lastly, the results will explore the variations in employee perceptions of safety culture as a moderator for the relationship.

Each subsection will include relevant statistical analyses, providing a comprehensive overview of the findings and implications for the mining industry. The results will be contextualised within the existing literature, emphasising the significance of understanding these relationships for fostering a positive workplace environment prioritising safety and engagement.

5.6.1. Hypothesis One

To answer the research question, do Ubuntu leadership principles positively influence employee engagement levels in the South African mining industry? The following hypothesis was made and tested.

H₁: There is a statistically significant positive relationship between Ubuntu leadership practices and employee engagement in the South African mining industry.

The correlation analysis reveals a significant positive relationship between Ubuntu leadership and employee engagement, with a Pearson correlation coefficient of 0.633, as shown in Table 3 below, indicating a strong association between the two variables ($p < 0.01$): Pearson's r quantifies the linear relationship between two continuous variables, with values above 0.5 typically indicating strong associations (Schober et al., 2018). This, therefore, means that the study can only reject the null hypothesis in favour of H₁: There is a statistically significant, positive relationship between Ubuntu leadership principles and employee engagement within the South African mining industry. This demonstrates that as Ubuntu leadership principles are perceived to be more effectively implemented, employee engagement levels also tend to increase correspondingly.

Table 3: Pearson correlation results for research question one (Source: IBM® SPSS and Researchers' Data)

Correlations			
		Ubuntu Leadership	Employee Engagement
Ubuntu Leadership	Pearson Correlation	1	.633
	Sig. (2-tailed)		.000
	N	351	351
Employee Engagement	Pearson Correlation	.633	1
	Sig. (2-tailed)	0.000	
	N	351	351
**. Correlation is significant at the 0.01 level (2-tailed).			

This study further went on to do the effect size to measure the magnitude or practical significance of a relationship or effect observed in a study, beyond what p-values alone. Table 4 below shows the results of the test. The regression analysis produced an R-value of 0.633, demonstrating a moderate-to-strong positive correlation between Ubuntu leadership and employee engagement. This relationship demonstrates that as Ubuntu leadership practices increase, there is a corresponding and significant rise in employee engagement levels.

Further, the model explains 40.1% of the variance in employee engagement, as indicated by the R Square value of 0.401, with an Adjusted R Square of 0.399. This means that the independent variable, Ubuntu leadership, accounts for a considerable portion of the variance observed in employee engagement, offering robust support for the hypothesised relationship. The standard error of the estimate, reported as 0.49095, indicates an acceptable level of accuracy in the model's predictions.

Table 4: Effect Size Model summary (Source: IBM® SPSS and Researchers' Data)

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.633 ^a	0,401	0,399	0,49095	0,401	233,787	1	349	0,000

The change statistics, with an F Change of 233.787 and a significance level of $p < 0.001$, demonstrate a statistically significant improvement in model fit, reinforcing the reliability of Ubuntu leadership as a predictor of employee engagement. This high significance level confirms that the positive association observed is not due to chance, adding to the credibility of the findings.

To further quantify Ubuntu leadership's impact on employee engagement, Cohen's f^2 was calculated, resulting in an effect size of approximately 0.67. Cohen's f^2 assesses the magnitude of effect, with values above 0.35 considered large, supporting substantial practical impact (Lakens, 2013). According to Cohen's conventions, this value reflects a large effect size, indicating that Ubuntu leadership substantially influences employee engagement in this context. This strong effect size emphasises Ubuntu leadership's practical significance in enhancing employee engagement.

5.6.2. Hypothesis Two

To answer the research question, does Ubuntu leadership influence employee engagement in the South African mining industry when controlling for demographic factors such as age, gender, tenure, and job role? The following hypothesis was made.

H₂: When controlling for demographic factors such as age, gender, tenure, and job role, Ubuntu leadership will significantly improve employee engagement in the South African mining industry.

The first regression analysis was done without demographic variables. The results for the model are shown in Table 14 in Appendix C. The model summary indicates a significant relationship between Ubuntu leadership and employee engagement, as the regression analysis reflects. The R-value of 0.633 signifies a strong positive

correlation, suggesting that Ubuntu leadership practices effectively contribute to employee engagement. Regression analysis quantifies the impact of independent variables on a dependent variable, with R-squared values showing the proportion of variance explained (Hayes, 2017). The R-squared value of 0.401 indicates that approximately 40.1% of the variance in employee engagement can be explained by Ubuntu leadership, demonstrating its substantial impact on this construct.

The adjusted R-squared value of 0.399 accounts for the number of predictors in the model, providing a more accurate representation of the relationship. This relatively high value suggests that including Ubuntu leadership as a predictor significantly enhances the understanding of employee engagement within the South African mining context.

The estimate's standard error, recorded at 0.49095, reflects the average distance that the observed values fall from the regression line, indicating a reasonable level of prediction accuracy within the model.

The ANOVA Table 5 below provides insights into the overall significance of the regression model assessing the relationship between Ubuntu leadership and employee engagement without controlling the demographic variables. The regression sum of squares is 56.349, reflecting the variance in employee engagement explained by the predictor variable, Ubuntu leadership. This is compared to a residual sum of squares of 84.119, indicating the variance not explained by the model.

Table 5: ANOVA results without demographic variables (Source: IBM® SPSS and Researchers' Data)

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56.349	1	56.349	233.787	.000 ^b
	Residual	84.119	349	.241		
	Total	140.468	350			
a. Dependent Variable: Employee_engagement						
b. Predictors: (Constant), Ubuntu_leadership						

The F-value of 233.787 signifies a statistically significant result, with a p-value of 0.000. This result indicates that the regression model is significant, suggesting that Ubuntu leadership is a meaningful predictor of employee engagement in this study. The high F-value implies that the model explains a substantial amount of variance in employee engagement compared to the error variance.

The coefficients Table 15 in Appendix C shows the results of the regression analysis assessing the impact of Ubuntu leadership on employee engagement. The unstandardised coefficient (B) for Ubuntu leadership is 0.574, indicating that employee engagement is expected to increase by 0.574 units for each unit increase in Ubuntu leadership, assuming all other variables are held constant. The standard error of this coefficient is 0.038, which reflects the estimate's variability.

The standardised coefficient (Beta) is 0.633, suggesting a strong positive relationship between Ubuntu leadership and employee engagement. This indicates that Ubuntu leadership contributes significantly to the sample population's variance in employee engagement scores. The t-value of 15.290 and the associated p-value of 0.000 indicate that this result is statistically significant, affirming the hypothesis that Ubuntu leadership is critical in enhancing employee engagement.

The second regression analysis was done with demographics as a control variable. The relationship between various demographic factors, including Ubuntu leadership and employee engagement, is indicated Table 16 in Appendix C. The R-value of 0.667 suggests a strong positive correlation between the predictors and employee engagement, indicating that higher levels of these variables are associated with increased employee engagement.

The R Square value of 0.444 indicates that approximately 44.4% of the variance in employee engagement can be explained by the model, which includes Ubuntu leadership and demographic variables such as age, gender, commodity, position, race, and tenure. This level of explanation suggests that while Ubuntu leadership plays a significant role, other demographic factors also contribute to employee engagement outcomes, reflecting findings from previous research emphasising the complex interplay between leadership and demographic characteristics in workplace settings (Janes et al., 2021; Quansah et al., 2023).

The Adjusted R Square value of 0.433 is slightly lower than the R Square value, accounting for the number of predictors in the model. This indicates that even after

adjusting for the number of variables, the model remains robust, suggesting that including demographic factors provides a meaningful contribution to understanding employee engagement.

Additionally, the Standard Error of the Estimate of 0.47770 reflects the average distance that the observed values fall from the regression line, indicating a reasonable fit of the model to the data. Finally, the Durbin-Watson statistic of 1.827 suggests that there is no significant autocorrelation in the residuals, further supporting the validity of the model. These findings underscore the importance of Ubuntu leadership and demographic factors in influencing employee engagement, providing valuable insights for organisations looking to enhance workplace dynamics and improve overall performance. Table 6 below shows the ANOVA results. The ANOVA results provide insight into the significance of the overall model in explaining employee engagement. The Sum of Squares for the regression model is 62.395, while the residual sum of squares is 78.043, resulting in a Total Sum of Squares of 140.437. The degrees of freedom (df) for the regression is 7, indicating that seven predictors were included in the model.

Table 6: ANOVA Results with demographics as a control variable (Source: IBM® SPSS and Researchers' Data)

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.395	7	8.914	39.061	.000 ^b
	Residual	78.043	342	.228		
	Total	140.437	349			
a. Dependent Variable: Employee_Engagement						
b. Predictors: (Constant), V6, Ubuntu_Leadership, Age, Gender, Commodity, Position, Race, Tenure: Demographics						

The Mean Square for regression is calculated as 8.914, which, when compared to the residual mean square of 0.228, yields an F-value of 39.061. This high F-value suggests a robust relationship between the predictors and employee engagement.

The significance level (Sig.) is reported as 0.000, which is below the conventional alpha level of 0.05. This indicates that the regression model significantly predicts employee engagement, affirming that at least one of the predictors, Ubuntu leadership or the demographic variables, contributes meaningfully to explaining variations in employee engagement.

The coefficients Table 17 in Appendix C provides a comprehensive overview of the relationships between the independent variables and employee engagement. The unstandardised coefficients indicate the expected change in employee engagement for a one-unit increase in the predictor, holding other variables constant. The constant term is 1.685, suggesting a baseline level of employee engagement when all predictors are zero.

The unstandardised coefficient for Ubuntu Leadership is 0.568, indicating that an increase in Ubuntu leadership principles correlates with increased employee engagement. Regression coefficients (e.g., Ubuntu leadership Beta = 0.626, $p < 0.001$) demonstrate that leadership practices consistently drive engagement, with age and tenure influencing engagement in expected directions, a typical trend in organisational studies (Kline, 2023).

The Age variable shows a positive unstandardised coefficient of 0.188 and a Beta of 0.216, indicating that older employees may have slightly higher engagement levels. This relationship is also statistically significant, with a t-value of 4.381 and a p-value of .000, corroborating the notion that age can be a factor in employee engagement (Brown et al., 2022).

In contrast, Gender has an unstandardised coefficient of -0.057 and a Beta of -0.044, indicating a negligible negative impact on employee engagement. The t-value of -1.044 and p-value of .297 suggest that this relationship is not statistically significant, implying that gender may not be critical in influencing employee engagement within this context (Ismail et al., 2021).

Race and commodity show low coefficients (0.031 and 0.017, respectively) and are statistically insignificant (p-values of .354 and .377). This may reflect the need for a broader understanding of how these factors interact with employee engagement in diverse workplace environments (Quansah et al., 2023).

Tenure has an unstandardised coefficient of -0.074, suggesting a slight negative effect on engagement, with a statistically significant p-value of .042. This might

indicate that longer tenure does not necessarily correlate with higher engagement, which can be supported by findings that longer service may lead to complacency in some contexts (Muthelo et al., 2022). The Position variable shows an unstandardised coefficient of 0.021 with a p-value of 0.155, indicating that job position does not significantly impact engagement in this sample.

The collinearity statistics for each variable show tolerances above 0.5 and Variance Inflation Factors (VIFs) below 2.0, suggesting no significant multicollinearity issues among the predictors, which further strengthens the reliability of the model (Prinsloo & Hofmeyr, 2022).

The residual statistics provide insight into the model's performance and the accuracy of the predictions for employee engagement. Table 18 in Appendix C shows the residual statistics results. The predicted value for employee engagement ranges from 3.1344 to 5.2275, with a mean of 4.3233 and a standard deviation of 0.42283. This indicates that the model generally predicts engagement levels toward the higher end of the scale, reflecting a positive employee engagement environment within the studied population.

The residuals, representing the differences between observed and predicted values, range from -1.62285 to 1.31006, with a mean of 0.00000 and a standard deviation of 0.47288. The mean residual of zero suggests that, on average, the model's predictions are accurate, as positive and negative errors balance each other out. However, the range of residuals indicates that some predictions significantly overestimate or underestimate the actual engagement levels.

The standardised predicted values range from -2.812 to 2.138, with a mean of 0.000 and a standard deviation of 1.000. This standardisation allows for a more comparable assessment of the predictions across different data points, indicating how far the predicted values deviate from the mean. The standardised residuals range from -3.397 to 2.742, with a mean of 0.000 and a standard deviation of 0.990. The standardised residuals being close to zero suggests that most observations are within a normal range of prediction error. Values beyond ± 2 are considered outliers, indicating some instances where the model's predictions were notably inaccurate.

The insights gleaned from these statistics suggest that while the model effectively predicts employee engagement for most cases, there may be specific areas or demographics where the model's predictions could be improved. Addressing these

outliers could enhance the model's overall performance and provide a more nuanced understanding of employee engagement dynamics in the South African mining industry.

Based on the regression analysis results, the null hypothesis (H_0), which stated that Ubuntu leadership would have no significant positive effect on employee engagement in the South African mining industry when controlling for demographic factors, is rejected. The first model, without demographic controls, showed a strong positive relationship between Ubuntu leadership and employee engagement with an R-value of 0.633 and an R-squared value of 40.1%, indicating that Ubuntu leadership alone accounts for a substantial portion of the variance in employee engagement. The significance of the model ($p = 0.000$) confirmed that Ubuntu leadership plays a critical role in enhancing employee engagement.

After controlling for demographic factors such as age, gender, tenure, and job role, the second regression analysis still revealed a significant positive impact, with the R-squared value increasing to 44.4%. This further supports the importance of Ubuntu leadership in promoting employee engagement, even when accounting for individual differences. Therefore, the alternative hypothesis (H_2) is accepted, demonstrating that Ubuntu leadership significantly improves employee engagement in the South African mining industry.

5.6.3. Hypothesis Three

To answer the research question, does safety culture moderate the relationship between Ubuntu leadership and employee engagement in the South African mining industry? The following hypothesis was made.

H_3 : Safety culture moderates the relationship between Ubuntu leadership and employee engagement in the South African mining industry. The positive effects of Ubuntu leadership on employee engagement are stronger in environments with a high safety culture than in environments with a low safety culture.

The regression analysis was done to prove the hypothesis. Table 19 Appendix D shows the model summary of the regression analysis done while considering safety culture as the moderator.

The R (Correlation Coefficient) value of 0.637 indicates a strong positive relationship between the predictors (Ubuntu leadership, safety culture, and the interaction term) and the dependent variable (employee engagement). This suggests that employee

engagement will likely increase as Ubuntu's leadership and safety culture improves. The R-squared value of 0.406 means that the model can explain approximately 40.6% of the variance in employee engagement. This is a decent level of explanatory power, indicating that while other factors influence employee engagement, the included predictors are significantly related to it.

With an adjusted R-squared of 0.401, this statistic accounts for the number of predictors in the model. The slight difference between R-squared and adjusted R-squared suggests that the model's explanatory power is stable even when considering the number of predictors. The standard error of 0.49030 indicates the average distance that the observed values fall from the regression line. A lower value suggests a better fit of the model. The Durbin-Watson Statistic value of 1.811 is close to 2, indicating no significant autocorrelation in the residuals, which supports the assumption of independent errors in the regression model. Table 7 below shows ANOVA results when testing for safety culture as the moderator. The Sum of Squares for Regression is 57.050, representing the variability explained by the regression model. This indicates how much of the total variation in employee engagement is attributed to the predictors: Ubuntu leadership, safety culture, and the interaction term. In contrast, the Sum of Squares for Residual, 83.418, represents the variability that is not explained by the model. This is the sum of the squared differences between the observed and predicted values. The Total Sum of Squares is 140.468, reflecting the overall variability in employee engagement, the sum of the regression and the residual sum of squares.

Table 7: ANOVA results for safety culture as the moderator (Source: IBM® SPSS and Researchers' Data)

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	57.050	3	19.017	79.106	.000 ^b
	Residual	83.418	347	.240		
	Total	140.468	350			
a. Dependent Variable: Employee Engagement						
b. Predictors: (Constant), Interaction_term, Ubuntu_Leadership, Safety Culture ^b						

The F Statistic of 79.106 tests the overall significance of the model, with a high F value suggesting that at least one of the predictors is significantly related to employee engagement. Interaction terms in regression help reveal moderation effects, where a significant interaction indicates the moderator's role (Hayes, 2017). Finally, the Significance (Sig.) value is 0.000, indicating that the regression model is highly statistically significant. Given that the p-value is less than 0.01, this result strongly suggests that the predictors significantly explain the variance in employee engagement, offering robust evidence against the null hypothesis. The ANOVA results strongly support the regression model, indicating that Ubuntu's leadership and safety culture and interaction term significantly contribute to employee engagement. These findings can guide organisations in implementing effective leadership strategies and cultivating a safety-oriented culture to enhance employee engagement and overall organisational performance.

The coefficients overview, as shown in Table 20 in Appendix D, highlights the relationships between the predictors and employee engagement. The constant ($B = 2.126$) sets a baseline, representing the expected level of employee engagement when all predictors, Ubuntu leadership, safety culture, and the interaction term are zero. Ubuntu leadership shows the most significant positive effect, with an unstandardised coefficient ($B = .540$), meaning that for every unit increase in Ubuntu leadership, employee engagement rises by 0.540 units. Its standardised coefficient (Beta = .595) underscores its strong influence, supported by a significant t-value (10.656, Sig. < .001). In contrast, safety culture has a modest positive impact ($B = .033$, Beta = .040), indicating a much smaller effect size, though still statistically significant ($t = .683$, Sig. = .004). The slight negative coefficient for the interaction term ($B = -0.028$) suggests that while safety culture boosts engagement independently, combining it with leadership may lead to diminishing returns, a finding observed in studies of complex workplace dynamics (Baron & Kenny, 1986).

Collinearity statistics reveal no multicollinearity issues, with tolerance values above 0.1 and variance inflation factor (VIF) values below 10. Ubuntu leadership has a VIF of 1.824, a safety culture of 1.990, and an interaction term of 1.137, all within acceptable ranges. These values confirm that the predictors are independent enough to be reliable in the model. The findings emphasise that while Ubuntu leadership is the most influential predictor of employee engagement, safety culture also plays a role, albeit to a lesser extent. The interaction between leadership and safety culture

appears complex, with a slight negative impact, indicating potential diminishing returns when both factors are combined.

In summary, the model demonstrates significant predictive power, suggesting that leadership and safety culture are key components in fostering employee engagement within the mining sector. Ubuntu leadership's strong positive influence underscores its importance in enhancing engagement, while safety culture, though less impactful, still contributes positively. The interaction effect may require further exploration to understand the nuances of how leadership and safety practices interact. The analysis provides valuable insights for improving organisational practices to increase employee engagement.

The residual statistics provide a detailed view of the model's fit regarding employee engagement, a summary of results shown in Table 21 in Appendix D. The predicted values range from 2.5942 to 4.9622, with a mean of 4.3238 and a standard deviation of 0.40373, suggesting a good fit for the regression model. The residuals, representing the differences between observed and predicted values, range from -1.67681 to 1.50202, with a mean of 0. This indicates that the model's predictions are generally accurate, though some values are overestimated or underestimated.

Standardised predicted values, which measure how far predicted values deviate from the mean, range from -4.284 to 1.581, with a mean of 0. This proper standardisation indicates that the model is well-calibrated. Similarly, standardised residuals, which assess the relative size of residuals, range from -3.420 to 3.063. While these values suggest some observations deviate significantly from the predicted values, the distribution of residuals around zero shows a well-fitting model. However, the presence of residuals outside ± 2 suggests possible outliers that may require further analysis.

The model's overall fit is validated by the normal distribution of residuals around zero, suggesting that the model is reliable. Further investigation into outliers and diagnostics, such as homoscedasticity and multicollinearity checks, can refine the model further. Visual residual plots can be useful in confirming the absence of patterns in the residuals, ensuring the robustness of the regression analysis and enhancing the insights derived from employee engagement in the context of Ubuntu leadership and safety culture.

Given the significance of the interaction term ($p < 0.01$), we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_3). However, the negative coefficient for the interaction term implies that the moderating effect of safety culture may be more complex than initially assumed. Instead of amplifying the positive effects of Ubuntu leadership, the interaction term suggests a potential decrease in engagement when both leadership and safety culture are high.

While Ubuntu's leadership and safety culture positively influence employee engagement, organisations must be mindful of how these factors interact. Simply improving both may not always result in higher engagement levels, particularly if employees perceive competing priorities between leadership and safety. The slight negative interaction effect warrants further investigation. Future studies could explore the conditions under which leadership and safety culture interact positively and whether factors such as communication, trust, or job demands influence this relationship.

In conclusion, the findings support the significance of Ubuntu leadership and safety culture in driving employee engagement but suggest that combined effects require a nuanced understanding to maximise engagement within the mining industry.

5.7. Similarity Testing

This section presents the analysis of key variables across two commodity groups in the mining sector: iron ore and other commodities. It explores differences in employee engagement, productivity, employment retention, Ubuntu leadership principles, and safety culture. Through statistical analysis, including group statistics and independent t-tests.

5.7.1. Group Statistics

The group statistics compared the two commodity groups, iron ore and other commodities, concerning work engagement, productivity, employment retention, Ubuntu leadership principles, and safety culture. It is seen that the overall respondents, N for the iron ore group, were 285, while the other commodities group had 66.

The results are shown in Table 8 below. Employee engagement scores are quite similar between the two groups, with the iron ore group slightly trailing the other commodities group (4.3175 vs. 4.3510), suggesting that employee engagement is generally strong across both mining sectors. Productivity, however, is noticeably

higher in the iron ore group (4.4433) compared to the other commodities (4.2778), which may point to operational efficiencies, resource management, or other industry-specific advantages in the iron ore sector.

Table 8: Group Statistic comparing iron ore commodity with the rest (Source: IBM® SPSS and Researchers' Data)

Group Statistics					
	Commodities produced by mines	N	Mean	Std. Deviation	Std. Error Mean
Employee Engagement	Iron Ore	285	4.3175	.63128	.03739
	Other Commodities	66	4.3510	.64724	.07967
Productivity	Iron Ore	285	4.4433	.52369	.03102
	Other Commodities	66	4.2778	.49470	.06089
Employment Retention	Iron Ore	285	4.0737	.85981	.05093
	Other Commodities	66	3.8864	.98760	.12156
Ubuntu_Leadership_Principles	Iron Ore	285	3.8674	.70198	.04158
	Other Commodities	66	3.8091	.68629	.08448
Safety Culture	Iron Ore	285	4.1228	.74806	.04431
	Other Commodities	66	4.2677	.70703	.08703

Employment retention is also higher in the iron ore group (4.0737 vs. 3.8864), possibly indicating more favourable conditions for long-term employee retention in this sector due to better career growth opportunities or more stable working environments. When it comes to Ubuntu leadership principles, centred on community, respect, and inclusivity, both groups scored similarly, with the iron ore group slightly ahead (3.8674 vs. 3.8091), highlighting that Ubuntu principles are somewhat equally valued across the mining industry. Lastly, regarding safety culture, the other commodities group reports a stronger emphasis (4.2677 vs. 4.1228), suggesting that non-iron ore mining sectors may have more stringent or well-developed safety protocols in place.

The comparison indicates similar employee engagement levels between iron ore and other commodities, though iron ore shows higher productivity and employment retention, suggesting possible advantages in efficiency and stability. Ubuntu leadership principles are valued comparably across sectors, with iron ore slightly

ahead. However, the other commodities group demonstrates a stronger safety culture, implying more rigorous safety protocols outside the iron ore sector. These differences suggest sector-specific strengths in productivity, retention, and safety focus.

5.7.2. Independent T-Test

An independent t-test was conducted to assess whether significant differences existed in the mean scores of the two groups for each of the five variables. This test compares the means of two independent groups, appropriate for determining differences across groups in employee engagement and productivity (Kim, 2015). Before conducting the t-test, Levene's test confirmed equal variances across groups, an assumption necessary for reliable t-test results (Pallant, 2020). The null hypothesis for Levene's test stated that the variances of the two groups were approximately equal. As shown in Table 9 below. Levene's test results consistently supported the null hypothesis for all variables, meaning that equal variances could be assumed for the t-test.

Table 9: Independent Samples Test Comparing iron ore with other commodities
(Source: IBM® SPSS and Researchers' Data)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Employee_Engagement	Equal variances assumed	.047	.828	-.386	349	.700	-.03347	.08664	-.20388	.13695
	Equal variances not assumed			-.380	95.731	.705	-.03347	.08801	-.20817	.14124
Productivity	Equal variances assumed	1.027	.312	2.337	349	.020	.16550	.07082	.02622	.30478
	Equal variances not assumed			2.422	101.550	.017	.16550	.06834	.02994	.30106
Employment Retention	Equal variances assumed	.391	.532	1.549	349	.122	.18732	.12089	-.05045	.42509
	Equal variances not assumed			1.421	89.192	.159	.18732	.13180	-.07456	.44920
Ubuntu_Leadership_Principles	Equal variances assumed	.341	.560	.610	349	.542	.05828	.09550	-.12954	.24610
	Equal variances not assumed			.619	98.983	.537	.05828	.09416	-.12855	.24510
Safety Culture	Equal variances assumed	.388	.534	1.432	349	.153	-.14487	.10117	-.34384	.05410
	Equal variances not assumed			1.483	101.507	.141	-.14487	.09766	-.33859	.04885

The results of Levene's Test consistently supported the null hypothesis, suggesting equal variances between the two groups across all five variables. For employment

engagement, the test result ($F = 0.047$, $p = 0.828$) indicated that the variances were approximately equal, meaning that the distribution of scores for both groups was similar in shape. A similar conclusion was reached for productivity ($F = 1.027$, $p = 0.312$), employment retention ($F = 0.391$, $p = 0.532$), Ubuntu leadership principles ($F = 0.341$, $p = 0.560$), and safety culture ($F = 0.388$, $p = 0.534$). Therefore, the null hypothesis of equal variances was accepted across all variables, indicating no significant differences in the distribution shapes between the two groups.

In addition to Levene's Test, an independent t-test was conducted to assess whether there were statistically significant differences in the mean scores between the iron ore and other commodities groups for the same five variables. The null hypothesis for the t-test posited that there was no significant difference, while the alternate hypothesis suggested otherwise.

The t-test results indicated that for employment engagement ($t = -0.386$, $p = 0.700$), Ubuntu leadership principles ($t = 0.610$, $p = 0.542$), and employment retention ($t = 1.549$, $p = 0.122$), there were no statistically significant differences in the mean scores between the two groups. Thus, the null hypothesis was retained for these variables. However, for productivity, a statistically significant difference was found ($t = 2.337$, $p = 0.020$), where the iron ore group demonstrated higher productivity compared to the other commodities group, leading to the rejection of the null hypothesis for this variable. In contrast, no significant difference was found for safety culture ($t = -1.432$, $p = 0.153$), and the null hypothesis was retained.

In summary, while productivity exhibited a statistically significant difference between the iron ore and other commodities groups, the remaining variables, employment engagement, employment retention, Ubuntu leadership principles, and safety culture, showed no significant differences in either variance or mean scores between the two groups.

5.7.3. Confidence Intervals

Along with the significance values derived from t-tests, 95% confidence intervals (CIs) offer valuable insights into the range within which the actual mean difference between two groups is likely to fall. Confidence intervals that contain zero imply no statistically significant difference between the groups, while intervals excluding zero indicate meaningful differences. Notably, CIs provide more detailed information than p-values alone, making them a powerful tool for interpreting data beyond the binary

significance threshold (Hopkins, 2022). Despite this, there is widespread misinterpretation across disciplines, with researchers often equating non-significant CIs to an absence of treatment effect (Lyu et al., 2020).

For employment engagement, Ubuntu leadership principles, and employment retention, the confidence intervals included zero, supporting the conclusion of no significant differences. In contrast, the confidence interval did not include zero for productivity, confirming the significant difference observed between the iron ore and other commodities groups. Similarly, the confidence interval for safety culture included zero, indicating no significant difference between the groups.

Overall, the analysis indicates that the two commodity groups, iron ore and other commodities, are similar regarding employee engagement, employment retention, Ubuntu leadership principles, and safety culture. The one exception is productivity, where the iron ore group exhibited a statistically significant advantage. These results suggest that while most work-related factors are comparable between the two sectors, productivity may be influenced by unique operational or resource management practices within the iron ore industry.

5.8. Chapter 5 Conclusion

This chapter provided a detailed summary of the findings on the influence of Ubuntu leadership on employee engagement within the South African mining industry, with specific attention to the moderating role of safety culture. The initial section described the data preparation process, outlining coding methods and cleaning steps to ensure data reliability. The demographic analysis offered insights into the participant profile, revealing a workforce primarily composed of operators and general labourers, with a notable representation from the iron ore sector. These demographic trends provide a critical context for understanding how various groups within the industry perceive leadership and engagement, setting the stage for the study's deeper analyses.

In the descriptive statistics section, the key variables, Ubuntu leadership, employee engagement, and safety culture, were examined regarding central tendencies and variability. High engagement scores suggested that employees generally experience positive work energy, dedication, and immersion. Additionally, the results demonstrated that Ubuntu leadership principles are widely practised, with collaboration and respect being particularly valued. Safety culture was also well-regarded, as reflected in employees' commitment to safety protocols and reporting

mechanisms. These descriptive findings support the hypothesis that Ubuntu's leadership and safety culture are integral to fostering a positive work environment, aligning with previous literature on the importance of these factors in high-risk industries.

The final sections focused on hypothesis testing, particularly examining the relationship between Ubuntu leadership and employee engagement and demographics and exploring safety culture's role as a moderator. The findings show that when controlling for demographic factors such as age, gender, tenure, and job role, Ubuntu leadership significantly improves employee engagement in the South African mining industry. This suggests that Ubuntu leadership strongly influences engagement across diverse employee groups, even when accounting for individual demographic differences.

Regression analysis confirmed a positive and significant link between Ubuntu leadership and engagement, explaining a substantial variance in engagement outcomes. Safety culture further strengthened this relationship, especially in environments with high safety prioritisation, although with some nuanced interactions. The similarity testing between iron ore and other mining commodities indicated that while engagement and Ubuntu leadership perceptions were consistent across groups, the iron ore sector showed productivity and employee retention advantages. Overall, these findings underscore the unique impact of Ubuntu's leadership and safety culture, providing actionable insights for improving employee engagement in the mining sector.

6. Chapter 6: Findings Discussion

6.1. Introduction

Chapter 6 aims to interpret the findings presented in Chapter 5, addressing the research questions and hypotheses outlined in Chapter 3. By comparing the empirical data with the theoretical frameworks and literature review discussed in Chapter 2, this chapter will comprehensively understand the relationships between key variables such as employee engagement, productivity, employment retention, Ubuntu leadership principles, and safety culture within the mining sector. This chapter assesses whether the results align with or challenge existing literature and draws conclusions regarding the research objectives.

The discussion follows a structured approach, beginning with a three-step analysis process for each variable: first, presenting the relevant data from Chapter 5, particularly referencing specific tables with significant results; second, interpreting these findings in the context of existing literature; and finally, drawing conclusions to address the research questions, propositions, or hypotheses (RQ/P/H) posed earlier in the study.

6.2. Research Model

The research model for this study explores the interactions between Ubuntu leadership, employee engagement, demographics, and safety culture within the South African mining industry. At its core, the model posits that Ubuntu leadership directly influences employee engagement by fostering a supportive work environment. This relationship is further nuanced by demographic factors, such as age, gender, race, and tenure, which serve as control variables, potentially altering how employees perceive leadership and engagement levels. The schematic view of the research model is shown in Figure 7 below.

Safety culture plays a critical moderating role in the relationship between Ubuntu leadership and employee engagement. The model suggests that while a strong safety culture can enhance the positive effects of Ubuntu leadership on engagement, it may also introduce complexities that could inhibit engagement under certain conditions. This dual interaction highlights the importance of managing safety initiatives alongside leadership practices to cultivate an engaging work environment. Ultimately, the research model aims to illuminate the intricate dynamics within the mining sector, providing actionable insights for practitioners and contributing to academic discourse on leadership and employee engagement.

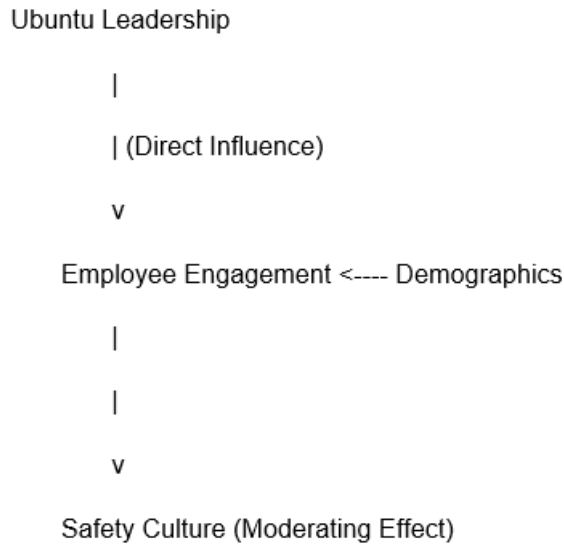


Figure 7: Research Model (Source: Researcher)

6.3. Demographics

6.3.1. Age

The findings reveal that a significant majority of participants (51.7%) are aged between 35 and 44 years, with a substantial portion (33.6%) in the 25 to 34 age brackets. These trends align with existing literature indicating that older employees typically possess more work experience and often exhibit higher engagement levels (Alam et al., 2022). The lower percentages of respondents under 25 (0.85%) and those aged 45 to 54 (11.9%) suggest a workforce primarily composed of mid-career professionals, which could influence perceptions of leadership styles. Studies have shown that younger generations prefer transformational and empowering leadership styles (Molek et al., 2023), which may impact engagement with Ubuntu leadership practices. Additionally, age-related differences in socio-emotional perspectives are essential as older employees view leaders as more communal and relational (Thrasher et al., 2020).

6.3.2. Gender

The gender distribution within the sample indicates a predominance of male respondents (67.2%), which is consistent with broader gender dynamics within the mining sector. The underrepresentation of women in this industry can significantly influence corporate culture and leadership perceptions (Lee & Park, 2020). Female employees often perceive transformational leadership more positively than male counterparts (Lee & Park, 2020), suggesting that the predominance of male

leadership could shape employee engagement and perceptions of safety culture. This overrepresentation of males highlights the necessity of considering gender when examining leadership styles and employee commitment in mining environments (Hatmaker & Hassan, 2021).

6.3.3. Race

The racial composition of the respondents indicates that Africans constitute a significant majority (73.7%), followed by Coloured (22%) and White individuals (4%). This demographic distribution reflects the historical legacy of racial segregation within the mining industry, which continues to affect workplace dynamics today (Macmillan, 2017). The disparities in representation across racial groups highlight the importance of inclusivity in leadership practices. Previous research suggests that positive leadership approaches, which focus on inclusivity and reducing discrimination, can foster employee well-being and enhance engagement (Adams, 2019). The strong representation of African employees suggests the need for leadership styles that resonate with this demographic's values, which can facilitate greater psychological empowerment and work engagement (Towsen et al., 2020).

6.3.4. Work Tenure

The results indicate that a considerable portion of the workforce (40.7%) has been in the mining industry for 10 to 20 years, with another 34.5% having 5 to 10 years of experience. Research highlights that work tenure significantly influences employee engagement and perceptions of leadership (Kiyak & Bozkurt, 2020). Experienced employees often prefer supportive leadership for structured tasks, indicating that tenure may shape the effectiveness of leadership styles in promoting engagement (Wang et al., 2019). Thus, controlling for work tenure in this study is essential to accurately isolate leadership's effects on engagement.

6.3.5. Job Role

The distribution of job roles indicates that frontline employees, including operators and general labourers (51.6%), comprise a significant portion of the workforce, while managerial roles constitute only 16.6%. This disparity suggests that frontline workers may prioritise safety and communication, which aligns with findings that job roles significantly shape perceptions of leadership (Nguyen & Malik, 2022). The predominance of frontline workers in the sample may influence how Ubuntu leadership is perceived and its effectiveness in fostering engagement and safety culture.

6.3.6. Mine Commodity

The study's findings reveal that iron ore was the most dominant commodity, representing 80.2% of the respondents, coal at 13.1%, and platinum at 3.7%. This distribution reflects the composition of mining activities in South Africa but highlights a unique iron ore concentration, which contrasts with broader industry patterns. According to the Minerals Council South Africa (2023), the mining industry is generally more diverse, with platinum group metals leading in workforce size, accounting for about 39.5%, followed by coal at 17%, and gold still maintaining significance at 13%. In contrast, iron ore dominates in this study, whereas iron ore typically represents around 8% of mining jobs nationally.

Coal's representation in the study sample at 13.1% aligns closely with its national employment share of 17%, as reported by Minerals Council South Africa (2023), suggesting its critical role in the workforce nationally and within the sample population. However, the significantly smaller representation of platinum (3.7%) and other vital commodities such as gold, diamonds, and manganese (each less than 1%) in the study sample deviates from broader industry proportions.

The discrepancy in the prominence of iron ore in the sample compared to the national industry could be attributed to the geographic focus or specific mining regions where the survey was conducted, the Northern Cape, which is rich in iron ore production. This geographic concentration skewed the commodity representation, as iron ore mines dominate this region. On the other hand, underrepresenting other significant commodities such as PGMs, diamonds, and chrome could indicate the survey's limited reach in regions where these commodities are more prevalent, such as the North West and Limpopo provinces for platinum.

6.3.7. Conclusion

The demographic analysis underscores the importance of considering age, gender, race, work tenure, job roles, and the nature of mining commodities when examining the relationship between Ubuntu leadership, employee engagement, and safety culture in the South African mining industry. These demographic factors can significantly shape employees' perceptions and responses to leadership styles, influencing the effectiveness of engagement strategies and safety practices. Recognising and addressing these dynamics, mining organisations can foster a more inclusive, equitable, and productive workplace environment.

6.4. Ubuntu Leadership Influence on Employee Engagement.

Hypothesis 1 (H_1) posits that there is a statistically significant positive relationship between Ubuntu leadership principles and employee engagement in the South African mining industry. This hypothesis was tested and validated through the results presented in Table 3 of Chapter 5 (Pearson correlation results) shows a strong positive correlation between Ubuntu leadership and employee engagement. The analysis confirms that Ubuntu's leadership principles significantly enhance employee engagement, as predicted.

The South African mining industry faces significant challenges, including safety concerns, gender inequality, and socio-political legacies, which impact employee engagement. Ubuntu leadership offers a culturally resonant solution by promoting community values such as empathy, inclusivity, and interconnectedness. As noted in Chapter 2, Ubuntu leadership is built on principles of respect, inclusivity, and compassion, which align with the needs of a diverse workforce in high-risk environments such as mining.

The results in Table 3 (Chapter 5) demonstrate that Ubuntu leadership, through its focus on collaboration and respect, improves key engagement indicators like dedication and absorption. These results underscore the potential of Ubuntu leadership to address critical issues in the South African mining sector, such as high turnover and low morale, while enhancing safety and operational efficiency (Nguyen & Nguyen, 2020; Kotzé & Nel, 2020).

The findings of this study contribute to expanding leadership theory by offering insights into Ubuntu leadership's role in enhancing employee engagement. While Chapter 2 discussed traditional Western leadership models such as transformational and transactional leadership, the findings confirm that Ubuntu leadership provides a more culturally aligned alternative in the South African context (Molose et al., 2018; Tauetsile, 2021).

Unlike Western models such as transformational leadership, Ubuntu leadership prioritises collective well-being over individual performance (Decuyper & Schaufeli, 2021). While transformational leadership encourages personal motivation and vision, Ubuntu leadership's focus on community, empathy, and shared success aligns more closely with the values and expectations of South African mining employees. As reflected in Table 3 in Chapter 5, Ubuntu leadership principles,

particularly respect and inclusivity, correlate more strongly with engagement indicators than models like transactional leadership, which tends to focus on performance rewards (Gemedda & Lee, 2020).

This comparison underscores the significance of integrating Ubuntu leadership into leadership strategies in South Africa's mining sector, where employees benefit from a more collaborative, community-oriented approach to leadership (Abrahams, 2021). As Chapter 2 highlighted, the socio-historical context of mining in South Africa demands a leadership model that addresses performance and acknowledges the deep-rooted need for equity, empathy, and mutual respect (Molose et al., 2018).

In conclusion, the results from Table 3 supports Hypothesis 1, confirming that Ubuntu leadership positively impacts employee engagement in the South African mining industry. The findings demonstrate the relevance of Ubuntu leadership in fostering higher engagement levels, particularly in sectors with complex socio-cultural dynamics like mining.

Drawing from Chapter 2, Ubuntu leadership's respect, inclusivity, and interconnectedness improve engagement and create safer and more productive working environments (Nguyen & Nguyen, 2020). These insights add depth to existing leadership theories by validating the importance of culturally relevant leadership models, especially in non-Western contexts like South Africa.

To further quantify the impact of Ubuntu leadership on employee engagement, Cohen's f^2 was calculated, resulting in an effect size of approximately 0.67. According to Cohen's conventions, this value reflects a large effect size, indicating that Ubuntu leadership substantially influences employee engagement in this context. This substantial effect size emphasises Ubuntu Leadership's practical significance in enhancing employee engagement.

These findings underscore the critical role of Ubuntu leadership in fostering an engaged workforce in the South African mining industry. The effect size demonstrates this leadership approach's statistical significance and real-world importance, suggesting that organisations adopting Ubuntu principles may see considerable gains in employee morale and commitment. Overall, this analysis contextualises the power and relevance of Ubuntu Leadership in promoting a positive and engaged work environment within the sector.

Ultimately, integrating Ubuntu leadership offers mining companies a valuable framework for improving employee well-being, safety, and operational efficiency. This study provides a pathway for future leadership strategies prioritising engagement and collective success in high-risk industries by bridging the gap between traditional Western leadership models and African communal values.

6.5. The Relationship While Control for Demographic Factors

This section addresses Hypothesis 2: When controlling for demographic factors, Ubuntu leadership will significantly improve employee engagement. The aim is to explore how Ubuntu leadership affects employee engagement when demographic variables such as age, gender, work tenure, and job role are controlled. By analysing the data presented in Chapter 5, one will better understand whether the relationship between Ubuntu leadership and engagement holds consistently across diverse demographic groups within the South African mining industry.

The findings from Chapter 5, specifically Table 17, indicate that Ubuntu leadership maintains a positive and significant effect on employee engagement, even when critical demographic factors are considered. By controlling for age, gender, work tenure, and job role, the analysis provides a more nuanced understanding of Ubuntu leadership's influence.

Including demographic controls, it is revealed that Ubuntu leadership's effect on employee engagement is robust, suggesting that its principles of empathy, inclusivity, and respect are practical across various demographic groups. This implies that Ubuntu leadership does not disproportionately benefit or disadvantage specific groups based on demographic characteristics, reinforcing the universality of its positive effects on employee engagement (Chetty & Price, 2024).

Age is a significant factor that can influence leadership perception and engagement. Research shows that younger employees prefer leadership styles that emphasise personal growth and empowerment, while older employees may value stability and respect (Molek et al., 2023). Despite these generational differences, the analysis showed that Ubuntu leadership had a consistent positive effect across all age groups. This demonstrates that Ubuntu leadership's focus on empathy and interconnectedness resonates with younger and older employees, enabling leaders to bridge generational gaps effectively.

The robustness of Ubuntu's leadership across age groups indicates its potential to harmonise diverse perspectives within a multigenerational workforce. Younger employees, often seeking inclusivity and involvement, benefit from Ubuntu's collaborative nature, while older employees, who may prioritise respect and stability, find value in Ubuntu's emphasis on dignity and collective well-being (Tauetsile, 2021). Therefore, the positive relationship between Ubuntu leadership and engagement holds firm, regardless of generational differences in leadership preferences.

Gender plays a crucial role in shaping employee perceptions of leadership styles. Leadership approaches that emphasise inclusivity, and respect is critical in male-dominated industries like mining, where women may face unique challenges (Kotzé & Nel, 2020). By controlling for gender, the analysis in Table 17 showed that Ubuntu leadership significantly improved engagement for both male and female employees. Notably, female employees, who often face more significant barriers to inclusion and recognition in the mining industry, demonstrated higher levels of engagement under Ubuntu leadership, which prioritises inclusivity and communal success.

This finding aligns with studies showing that female employees generally respond more positively to leadership styles prioritising respect and empathy (Sibanda & Grobler, 2023). Ubuntu leadership, focusing on these qualities, is particularly effective in promoting engagement among female employees in traditionally male-dominated settings. Male employees also benefit from Ubuntu leadership, particularly its emphasis on teamwork and respect, reinforcing that Ubuntu leadership can successfully engage a diverse workforce (Chetty & Price, 2024).

Work tenure is another crucial demographic variable influencing how employees perceive and respond to leadership. Longer-tenured employees may place more value on stability and respect, while newer employees might prioritise inclusion and a sense of belonging (Kiyak & Bozkurt, 2020). The results in Table 17 demonstrate that Ubuntu leadership significantly enhances engagement across varying lengths of work tenure, suggesting that its principles of empathy, inclusivity, and respect are practical regardless of how long employees have been with the company.

For employees with longer tenures, Ubuntu leadership's focus on dignity and respect helps sustain commitment and motivation, preventing disengagement or stagnation. For newer employees, the emphasis on inclusivity and collective support creates a

welcoming and engaging work environment, facilitating quicker integration into the team. The ability of Ubuntu leadership to engage both seasoned and new employees underscores its flexibility and broad applicability in enhancing workforce cohesion (Muller et al., 2019).

Job roles in the mining industry vary significantly, from frontline workers to supervisors and managers, each requiring different leadership approaches. Ubuntu leadership, with its focus on empathy, teamwork, and collective well-being, was found to influence engagement across all job roles positively. The analysis in Table 17 indicates that operational and managerial employees reported higher engagement levels under Ubuntu leadership, emphasising its versatility.

For operational staff, Ubuntu leadership's emphasis on teamwork and community fosters a sense of support and collective responsibility, which is crucial in high-risk environments like mining (Prinsloo & Hofmeyer, 2022). For managerial staff, the focus on inclusivity and shared leadership promotes a culture of mutual respect and collaboration, enhancing the ability to lead effectively. This broad applicability across job roles suggests that Ubuntu leadership is well-suited to fostering engagement at all levels of the mining industry (Towsen et al., 2020).

The South African mining industry presents a unique socio-political and operational context that makes leadership effectiveness challenging, particularly in managing a diverse workforce. Ubuntu leadership's principles of respect, inclusivity, and empathy resonate deeply with employees from various demographic backgrounds, offering a leadership model that aligns with the values of equality and community central to South Africa's socio-cultural fabric (Nwozaku, 2023). This universality is especially valuable in addressing the historical inequalities and demographic diversity within the mining sector, where leaders must foster engagement across lines of gender, age, tenure, and job roles.

The findings extend leadership theory by demonstrating that Ubuntu leadership can maintain effectiveness across diverse demographic groups, further emphasising the value of culturally specific leadership models. In contrast to many Western leadership models, which often rely on hierarchical structures and may not fully account for cultural and demographic nuances, Ubuntu leadership adapts well to the socio-cultural complexities of South Africa's mining workforce (Muller et al., 2019). This strengthens the argument for adopting leadership models rooted in local

philosophies, providing more relevant and practical tools for enhancing engagement in non-Western contexts.

The findings of this study support the hypothesis that Ubuntu leadership significantly improves employee engagement across diverse demographic groups. By controlling for factors like age, gender, work tenure, and job role, the analysis revealed that Ubuntu leadership's positive impact on engagement is robust and widely applicable. Ubuntu leadership's inclusivity, empathy, and respect resonate with employees regardless of demographic background, making it a highly effective leadership style for the South African mining industry.

Ubuntu leadership helps bridge gaps between different demographic groups by fostering a sense of community and shared responsibility, creating a more engaged and unified workforce. This study highlights the importance of culturally relevant leadership approaches and underscores the potential of Ubuntu leadership to address the unique challenges of the South African mining sector, where demographic diversity and historical inequalities pose significant challenges.

6.6. Safety Culture as the Moderator for the Relationship

This section presents an analysis of Hypothesis 3 (H₃): Safety culture moderates the relationship between Ubuntu leadership and employee engagement in the South African mining industry, such that the positive effects of Ubuntu leadership on employee engagement are more potent in environments with a high safety culture compared to environments with a low safety culture. The discussion integrates findings from Chapter 5 and evaluates the findings, considering the literature reviewed in Chapter 2.

The findings presented in Table 19 and Table 20 offer substantial evidence that safety culture moderates the relationship between Ubuntu leadership and employee engagement. The results indicate a stronger correlation between Ubuntu leadership principles and employee engagement in environments with a well-established safety culture. Specifically, the positive effects of Ubuntu leadership, such as inclusivity, respect, and interconnectedness, are amplified in high-safety culture environments, showing significantly higher engagement levels among employees in these settings.

In contrast, environments with a weak safety culture showed a less pronounced impact of Ubuntu leadership on employee engagement, suggesting that safety culture enhances the leadership's effectiveness in promoting engagement.

According to the literature, safety culture is critical in high-risk industries like mining, where the operational environment demands stringent safety protocols (Prinsloo & Hofmeyr, 2022). Opoku et al. (2020) highlight that a robust safety culture fosters a sense of shared responsibility, a core tenet of Ubuntu leadership. This alignment enhances employee engagement by making workers feel protected and valued. In line with Tauetsile (2021), a high-safety culture environment promotes open communication and collective well-being, reinforcing Ubuntu leadership's emphasis on empathy and community.

The findings support Quansah et al. (2023), who state that safety culture can significantly enhance leadership's influence on engagement, especially in high-risk industries. The research confirms that safety culture ensures physical safety and contributes to psychological safety, encouraging higher levels of employee engagement.

The results strongly support H₃, demonstrating that a strong safety culture amplifies Ubuntu leadership's positive effects on employee engagement in the South African mining industry. When safety is prioritised, Ubuntu leadership's focus on inclusivity, empathy, and interconnectedness significantly impacts employee motivation and commitment.

The findings significantly affect the mining industry, where safety is paramount due to hazardous working conditions. Ubuntu leadership can be a powerful tool for fostering employee engagement, improving safety compliance, reducing accidents, and enhancing productivity in mines with strong safety cultures. This creates a virtuous cycle where engaged employees are more vigilant about safety protocols, further strengthening the safety culture.

In South Africa, where historical and socio-economic factors influence workforce dynamics, combining Ubuntu leadership with a robust safety culture addresses operational and human-centred challenges. This integrated approach can mitigate high turnover, low morale, and safety violations, promoting a more inclusive, safe, and productive mining environment.

This study adds to the growing body of research on Ubuntu leadership by demonstrating its context-specific applicability in high-risk industries like mining. By incorporating safety culture as a moderating variable, the study extends the theoretical understanding of how Ubuntu leadership influences employee

engagement. It also contributes to leadership theory by showing how Ubuntu's collective and empathetic values align with safety protocols to enhance engagement in a way that traditional Western leadership models may not.

This finding aligns with Prinsloo & Hofmeyr (2022), who emphasise that leadership in high-risk environments requires more than technical safety measures; it requires a human-centred approach that aligns with employees' psychological and emotional needs. This study, therefore, strengthens the theoretical framework around Ubuntu leadership's role in employee engagement, particularly in industries with solid safety demands.

Western leadership models, such as transformational and transactional leadership, focus on individual achievement and task-oriented outcomes (Decuyper & Schaufeli, 2021). In contrast, Ubuntu leadership emphasises communal well-being, empathy, and inclusivity, which align more closely with the collectivist culture prevalent in many African societies (Nwozaku, 2023). The findings from this study suggest that while Western models are effective in specific contexts, Ubuntu leadership is particularly well-suited to the socio-cultural and safety-focused demands of the South African mining sector.

Ubuntu leadership's emphasis on interconnectedness and empathy aligns well with safety culture by fostering collective responsibility and mutual care among employees. In contrast, Western models often prioritise individual performance and may not have the same integrative effect on safety and engagement.

The findings validate the moderating role of safety culture in the relationship between Ubuntu leadership and employee engagement, offering new insights into how leadership practices can be optimised in high-risk industries like mining. Safety culture not only enhances the effectiveness of Ubuntu leadership but also creates an environment where employees feel supported, engaged, and motivated. These results have practical implications for leadership development and organisational strategies within the mining sector, where integrating Ubuntu leadership with a strong safety culture can significantly improve safety performance and employee engagement.

6.7. Conclusion

In conclusion, this chapter confirms the critical role of Ubuntu leadership in enhancing employee engagement within the South African mining industry. The findings

consistently support the hypotheses that Ubuntu leadership significantly improves engagement levels across various demographic factors and that a robust safety culture amplifies these positive effects. The research also highlights the relevance of culturally aligned leadership models, such as Ubuntu, which emphasise empathy, inclusivity, and respect, compared to traditional Western models, which may not fully address the socio-cultural nuances of South Africa's mining workforce.

The validation of Hypothesis 1 confirms that Ubuntu leadership fosters a work environment conducive to higher engagement by promoting principles that resonate deeply with South African employees, particularly in addressing issues of trust and collaboration. Additionally, Hypothesis 2 shows that Ubuntu leadership's impact remains consistent across different age groups, genders, and tenures, reinforcing its versatility in engaging diverse employee groups. This affirms Ubuntu leadership as an effective and inclusive approach that bridges demographic gaps (Nguyen & Nguyen, 2020; Tauetsile, 2021).

The moderating role of safety culture, as explored in Hypothesis 3, underscores its importance in amplifying the positive effects of Ubuntu leadership. Robust safety protocols protect employees physically and contribute to an environment of psychological safety, where Ubuntu leadership principles of interconnectedness and shared responsibility thrive, this enhances engagement and operational efficiency (Prinsloo & Hofmeyr, 2022).

Integrating Ubuntu leadership with a strong safety culture provides a strategic framework for more engaged, productive, and safer working conditions in the mining sector. These insights contribute to expanding leadership theory by advocating for culturally relevant approaches catering to non-Western industries' unique socio-economic and historical contexts.

In conclusion, the findings presented in Chapter 6 confirm the importance of Ubuntu leadership in fostering employee engagement within the South African mining sector. The results offer clear insights into the relationships between leadership, employee engagement, safety culture, and demographic factors by systematically analysing data through the research questions and hypotheses lens. Specifically, the Pearson correlation coefficients and regression analyses underscore the robust connection between Ubuntu leadership and employee engagement.

These results affirm previous literature, such as Muller (2019), supporting the notion that culturally grounded leadership styles like Ubuntu can significantly improve employee morale and performance. However, the findings also contribute new insights into the moderating role of safety culture, highlighting complexities that suggest potential diminishing returns when both Ubuntu leadership and safety culture are simultaneously elevated. This nuanced interaction demands further investigation to optimise leadership practices in high-risk environments.

Ultimately, the study provides valuable contributions to leadership theory, particularly within the context of the South African mining industry, by demonstrating the efficacy of Ubuntu leadership in driving engagement and organisational success. Addressing the research questions, the findings enhance understanding of leadership dynamics and suggest practical implications for organisational development.

7. Chapter 7: Conclusions and Recommendations

7.1. Introduction

This chapter synthesises the key findings of the research, focusing on the impact of Ubuntu leadership on employee engagement within the South African mining sector. The research objectives from Chapter 1 are revisited, linking back to the study's broader implications for leadership theory and practical application. Additionally, limitations encountered during the research process and recommendations for future studies are discussed. The chapter closes with insights into the implications of these findings for industry practitioners and academics while offering practical strategies for applying the research outcomes in organisational settings. Overall, this chapter not only concludes the research process but also underscores the broader value and impact of the findings.

This chapter builds on previous research, highlighting the mining sector's challenges, particularly in leadership and employee engagement. Given the demanding and high-risk nature of the mining industry, leadership that fosters engagement, safety, and productivity is essential for operational success (Nguyen & Nguyen, 2020). By closing the loop with Chapter 1, this chapter aims to bring the research full circle, emphasising the significance of Ubuntu leadership as a culturally resonant and contextually appropriate approach for addressing the specific challenges of the South African mining industry. The findings underscore the importance of aligning leadership styles with the values and needs of the workforce.

7.2. Main Findings

The three tested hypotheses drove the study's main findings. The analysis of Hypothesis 1 revealed a significant and positive relationship between Ubuntu leadership and employee engagement, providing strong support for the hypothesis. Specifically, Pearson's correlation results demonstrate an R-value of 0.633, indicating a moderate-to-strong positive correlation. This result suggests that Ubuntu Leadership, characterised by principles such as empathy, inclusivity, and mutual respect, substantially enhances employee engagement levels within the South African mining sector.

The effect size, calculated at approximately 0.67, reflects a significant practical impact, highlighting Ubuntu Leadership's substantial role in fostering a more engaged and committed workforce. These findings underscore the importance of leadership styles rooted in cultural values for improving organisational outcomes, aligning with previous research that emphasises the value of Ubuntu principles in promoting positive workplace dynamics.

The finding from Hypothesis 2 showed a strong positive correlation between Ubuntu leadership and employee engagement. Ubuntu leadership, with its emphasis on empathy, inclusivity, and interconnectedness, was shown to significantly enhance employee engagement across a wide demographic range, supporting Hypothesis 2, as was the case in the study by Chetty and Price (2024). The analysis demonstrated that employees who perceive leaders as embodying Ubuntu principles tend to exhibit higher levels of vigour, dedication, and absorption, key engagement indicators. This finding aligns with previous research highlighting the effectiveness of empathetic and inclusive leadership styles in promoting workplace well-being (Kotzé & Nel, 2020).

The study found that safety culture plays a crucial moderating role. In environments where safety culture is well-established, the positive effects of Ubuntu leadership on employee engagement were more pronounced. This suggests that a strong safety culture enhances employee well-being and amplifies the benefits of leadership practices that promote communal well-being and interconnectedness (Quansah et al., 2023). This interaction between leadership and safety culture underscores the need for mining companies to prioritise both leadership development and safety protocols to maximise engagement and performance.

Furthermore, no significant differences were identified between iron ore and other commodities, with productivity being the only exception. This suggests that Ubuntu leadership's positive impact on employee engagement and retention is relatively uniform across different mining sectors, indicating its broader applicability in diverse operational contexts. However, the variation in productivity may point to specific operational or environmental factors within commodity groups that influence outcomes beyond leadership and engagement. Further research into these commodity-specific factors could provide valuable insights for improving overall sector performance.

7.3. Recommendations for Practitioners

7.3.1. Mining Industry Leaders

South African mining industry leaders should actively integrate Ubuntu leadership principles into management practices. As demonstrated by the study, fostering empathy, inclusivity, and collaboration significantly improves employee engagement, which in turn enhances productivity and morale (Sibanda & Grobler, 2023). Mining companies can achieve this by promoting leadership training programs emphasising Ubuntu's core values, such as respect for individuals, communal well-being, and interconnectedness. Such leadership approaches are particularly practical in high-risk industries, where strong relationships between leaders and employees can foster a safer, more engaged workforce. Implementing leadership development programs that prioritise these values is essential for driving organisational success.

Additionally, given the strong relationship between safety culture and Ubuntu leadership's effectiveness, it is recommended that mining companies develop policies that promote both safety and communal values. Leaders should prioritise creating a culture where employees feel empowered to voice safety concerns and contribute to safety-related decision-making processes (Opoku et al., 2020). This will enhance safety compliance and reinforce trust and collaboration within teams. By integrating these practices into leadership models, companies can ensure that employee well-being remains at the forefront of organisational strategies, ultimately leading to improved performance and reduced turnover.

7.3.2. Human Resource Managers

Human resource managers play a critical role in fostering Ubuntu leadership within the organisations. To cultivate this leadership style, HR departments should design leadership development programs that focus on empathy, inclusivity, and respect for

all employees, regardless of position within the company (Towsen et al., 2020). These programs should be aimed at top management and mid-level supervisors who directly interact with employees daily. By embedding Ubuntu principles into leadership training, HR can help cultivate an environment where employees feel valued and connected to leaders, increasing engagement and retention.

Moreover, HR managers should integrate Ubuntu leadership principles into recruitment and performance management processes. By evaluating leadership candidates' ability to demonstrate empathy, inclusivity, and collaborative skills, companies can ensure that future leaders align with the organisation's values (Nwozaku, 2023). This will contribute to a more cohesive and motivated workforce. Additionally, HR should actively promote diversity and inclusion initiatives that align with Ubuntu leadership's focus on interconnectedness, ensuring that employees from diverse backgrounds feel valued and included in the workplace

7.4. Recommendations for Academics

This research contributes to the broader discourse on leadership by validating the efficacy of Ubuntu leadership in non-Western, high-risk industries. Academics should consider expanding research on Ubuntu leadership beyond the South African mining sector, exploring its applicability across different industries and cultural contexts. Understanding how culturally rooted leadership models like Ubuntu can foster engagement and performance in various settings is critical as globalisation continues to shape workplace dynamics. Future studies could also explore how Ubuntu leadership interacts with other leadership models, such as transformational or servant leadership, to provide a more comprehensive understanding of leadership effectiveness across cultures (Scott, 2023).

Moreover, the study highlights the importance of safety culture as a moderating variable in leadership studies. Academics are encouraged to investigate the relationship between safety culture and leadership effectiveness in other high-risk industries, such as manufacturing or construction. Understanding how leadership styles interact with organisational safety protocols could provide valuable insights for improving employee engagement and safety outcomes in these sectors. Further research into the specific demographic factors influencing leadership perceptions, such as age and gender, could enrich the theoretical understanding of leadership dynamics in diverse workforces.

7.5. Restatement of Limitations

While this research provides valuable insights into the role of Ubuntu leadership in fostering employee engagement, several limitations should be acknowledged. First, the study's reliance on self-reported data may introduce response bias, as participants may have provided socially desirable answers. Future research could address this limitation by incorporating mixed-method approaches, such as qualitative interviews or focus groups, to gain deeper insights into employees' experiences with leadership and engagement. Additionally, the study was conducted within a specific cultural and industrial context, the South African mining sector, which may limit the generalisability of the findings to other regions or industries (Govender & Bussin, 2020).

This study's findings provide insights primarily based on a sample in which employees from the iron ore sector were predominant. While this offered valuable data, the representativity of the sample may be limited by this dominance. Different mining commodities within South Africa, such as platinum, coal, gold, and diamonds, each present unique operational contexts, safety challenges, and leadership dynamics. For instance, each commodity's environmental, socio-economic, and regulatory challenges could influence how employees perceive and respond to Ubuntu leadership. Therefore, the generalisability of this study's findings across the entire mining sector may be limited, particularly for commodities underrepresented in the current sample.

Another limitation lies in the cross-sectional nature of the research, which captures data at a single point in time. While the study provides a snapshot of the relationship between leadership, safety culture, and engagement, it does not account for potential changes over time. Longitudinal studies could provide a more comprehensive understanding of how Ubuntu leadership impacts engagement and safety outcomes in the long term. Additionally, future research could explore the influence of other contextual factors, such as organisational size, technological advancements, or economic conditions, on the effectiveness of Ubuntu leadership in fostering engagement.

7.6. Recommendations for Future Research

Given the limitations outlined, several recommendations for future research emerge. First, longitudinal studies that track the impact of Ubuntu leadership on employee

engagement and organisational performance over time are recommended. Such studies would provide insights into the sustainability of Ubuntu leadership's effects and whether its impact on engagement and safety culture changes with evolving organisational dynamics. Second, future research should expand beyond the mining sector, exploring how Ubuntu leadership can be applied in other high-risk industries, such as construction and manufacturing, where safety and engagement are equally critical (Balfour, 2024).

Moreover, qualitative research methods, such as case studies or in-depth interviews, could provide richer insights into the experiences of employees working under Ubuntu leadership. This would allow researchers to explore the nuances of leadership dynamics and employee engagement more deeply, offering a more comprehensive understanding of the factors contributing to successful leadership. Future studies should focus on identifying and testing the specific mechanisms through which Ubuntu leadership influences employee engagement, such as psychological safety, trust, and empowerment, to offer more actionable insights for leaders and organisations (Pearce et al., 2023).

To improve the robustness of future research, it is recommended that studies ensure a more balanced representation of employees across various South African mining commodities. Future research could provide a broader understanding of Ubuntu leadership's impact across the diverse South African mining industry by expanding the sample to include a more proportionate number of employees from sectors such as platinum, coal, gold, and diamonds. Future research could consider conducting comparative studies among these commodities to examine sector-specific leadership practices and engagement challenges. For example, focusing on high-risk commodities like coal and gold, where safety and health concerns are particularly acute, could yield insights into how Ubuntu leadership might adapt to emphasise safety protocols more intensively

7.7. Conclusion

In conclusion, this study has demonstrated the significant positive impact of Ubuntu leadership on employee engagement in the South African mining sector. The research has shown that Ubuntu leadership, with its focus on empathy, inclusivity, and interconnectedness, effectively enhances employee engagement and promotes a safer and more collaborative working environment. By integrating these leadership principles, mining companies can foster a more motivated and committed workforce,

ultimately improving both safety and productivity outcomes (Ngobese et al., 2023). The findings of this study provide valuable insights for both practitioners and academics, contributing to the growing body of knowledge on culturally resonant leadership models in high-risk industries.

As the mining industry continues to face challenges related to safety, employee retention, and operational efficiency, Ubuntu leadership offers a promising solution. Its emphasis on communal well-being and shared responsibility aligns with the specific needs of the South African mining workforce, providing a leadership model that resonates with both employees and organisational goals. The study's findings suggest that mining companies that adopt Ubuntu leadership principles are likely to experience higher levels of engagement, reduced turnover, and improved safety outcomes, all of which contribute to the long-term sustainability and success of the sector.

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Appendices

Appendix A: Survey Questions

Section 1: Demographics

1. What is your age?

- Under 25
- 25-34
- 35-44
- 45-54
- 55 and above

2. What is your gender?

- Male
- Female
- Prefer not to say

3. What is your race?

- African
- White
- Coloured
- Indian
- Other

4. What is your mine's commodity?

- Iron ore
- Platinum
- Manganese
- Diamond

- Coal

5. How many years have you been working in the mining industry?

- Less than 5 years
- 5-10 years
- 10-20 years
- 20-30 years
- More than 30 years

6. What is your current position?

- Operator/General worker/Assistant
- Artisan
- Supervisor
- Manager
- Other (please specify)

Section 2: Employee Engagement (Based on Utrecht Work Engagement Scale - UWES)

Vigor

7. At my work, I always have positive energy.

- Never
- Rarely
- Sometimes
- Often
- Always

8. I feel strong and confident in my job

- Never
- Rarely

- Sometimes
- Often
- Always

Dedication

9. I find my work meaningful and purposeful

- Never
- Rarely
- Sometimes
- Often
- Always

10. I am enthusiastic about my job.

- Never
- Rarely
- Sometimes
- Often
- Always

Absorption

11. Time seems to fly when I am working.

- Never
- Rarely
- Sometimes
- Often
- Always

12. I am fully immersed in my work.

- Never

- Rarely
- Sometimes
- Often
- Always

Section 3: Safety Culture

13. I value safety as my first priority in my workplace.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

14. I voluntarily report any safety concerns.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

15. I follow Safety protocols that are enforced at my job site.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Section 4: Productivity

16. I am able to meet my productivity targets at work.

- Never
- Rarely
- Sometimes
- Often
- Always

17. I ensure that I ask for all necessary tools and resources to perform my job efficiently.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

18. I go above and beyond to improve my productivity at work.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Section 5: Employee Retention

19. I feel a strong sense of loyalty to my company.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

20. I see myself working at this company for the next few years.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Section 6: Ubuntu Leadership Principles

Respect

21. Management treats all employees with respect, regardless of position.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

22. I feel that my opinions are valued and respected by my colleagues.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Inclusivity

23. The company promotes a culture of inclusivity where everyone feels they belong.

- Strongly disagree
- Disagree

- Neutral
- Agree
- Strongly agree

24. I have equal opportunities for career advancement, regardless of my background.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Empathy

25. My supervisors/manager show genuine concern for my well-being.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

26. There is a sense of empathy and understanding among team members.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Interconnectedness

27. I feel a strong sense of connection and belonging with my colleagues.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

28. Teamwork and collaboration are encouraged and valued in my workplace.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Survival

29. Management/supervisor ensure that our work environment is safe and secure.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

30. There are initiatives in place to support our long-term health and well-being.

- Strongly disagree
- Disagree
- Neutral
- Agree

- Strongly agree

Appendix B: Descriptive Stats

Table 10: Productivity descriptive stats (Source: IBM® SPSS and Researchers' Data)

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
I am able to meet my productivity targets at work.	350	2	5	4.40	.660	-.719	.130
I ensure that I ask for all necessary tools and resources to perform my job efficiently.	351	1	5	4.40	.698	-1.194	.130
I go above and beyond to improve my productivity at work.	351	1	5	4.43	.655	-1.153	.130
Valid N (listwise)	350						

Table 11: Employee retention descriptive statistics (Source: IBM® SPSS and Researchers' Data)

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
I feel a strong sense of loyalty to my company.	351	1	5	4.14	.933	-1.051	.130
I see myself working at this company for the next few years.	351	1	5	3.93	1.041	-.800	.130
Valid N (listwise)	351						

Table 12: Safety culture descriptive statistics (Source: IBM® SPSS and Researchers' Data)

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
I value safety as my first priority in my workplace.	351	1	5	4.74	.560	-2.928	.130
I voluntarily report any safety concerns.	351	1	5	4.46	.747	-1.713	.130
I follow Safety protocols that are enforced at my job site.	351	1	5	4.59	.583	-1.428	.130
Valid N (listwise)	351						

Table 13: Ubuntu leadership principles descriptive statistics (Source: IBM® SPSS and Researchers' Data)

Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Management treats all employees with respect, regardless of position.	351	1	5	3.43	1.116	-.418	.130
I feel that my opinions are valued and respected by my colleagues.	351	1	5	3.80	.868	-.480	.130
The company promotes a culture of inclusivity where everyone feels they belong.	351	1	5	3.76	.963	-.658	.130
I have equal opportunities for career advancement, regardless of my background.	351	1	5	3.77	1.067	-.756	.130
My supervisors/manager show genuine concern for my well-being.	351	1	5	3.68	1.088	-.697	.130

There is a sense of empathy and understanding among team members	351	1	5	3.85	.840	-.523	.130
I feel a strong sense of connection and belonging with my colleagues.	351	1	5	3.94	.826	-.771	.130
Teamwork and collaboration are encouraged and valued in my workplace.	351	1	5	4.15	.796	-.780	.130
Management/supervisors ensure that our work environment is safe and secure.	351	1	5	4.07	.807	-.889	.130
There are initiatives in place to support our long-term health and well-being.	351	1	5	4.13	.801	-.834	.130
Valid N (listwise)	351						

Appendix C: Research Question 2 ANOVA Results

Table 14: Model summary results without demographic variables (Source: IBM® SPSS and Researchers' Data)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.633 ^a	.401	0.399	0.49095
a. Predictors: (Constant), Ubuntu_Leadership				

Table 15: Coefficients for without demographic variables (Source: IBM® SPSS and Researchers' Data)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.108	.147		14.319	.000
	Ubuntu_Leadership	.574	.038	.633	15.290	.000
a. Dependent Variable: Employee_Engagement						

Table 16: Model summary with demographics as control variable (Source: IBM® SPSS and Researchers' Data)

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.667 ^a	.444	.433	.47770	1.827
a. Predictors: (Constant), Ubuntu_Leadership, Age, Gender, Commodity, Position, Race, Tenure: Demographics					
b. Dependent Variable: Employee_Engagement					

Table 17: Coefficients for demographics as a control variable (Source: IBM® SPSS and Researchers' Data)

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.685	.233		7.245	.000		
	Ubuntu_Leadership	.568	.037	.626	15.352	.000	.978	1.023
	Age	.188	.043	.216	4.381	.000	.667	1.500
	Gender	-.057	.055	-.044	-1.044	.297	.927	1.078
	Race	.031	.034	.041	.929	.354	.822	1.217
	Commodity	.017	.019	.037	.884	.377	.922	1.084
	Tenure	-.074	.036	-.103	-2.041	.042	.641	1.559
	Position	.021	.015	.064	1.424	.155	.802	1.247
a. Dependent Variable: Employee_Engagement								

Table 18: Residual statistics with demographics as a control variable (Source: IBM® SPSS and Researchers' Data)

Residuals Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.1344	5.2275	4.3233	.42283	350
Residual	-1.62285	1.31006	.00000	.47288	350
Std. Predicted Value	-2.812	2.138	.000	1.000	350
Std. Residual	-3.397	2.742	.000	.990	350
a. Dependent Variable: Employee_Engagement					

Appendix D: Research Question 3 ANOVA Results

Table 19: Model summary for safety culture as a moderator (Source: IBM® SPSS and Researchers' Data)

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.637 ^a	.406	.401	.49030	1.811
a. Predictors: (Constant), Interaction_term, Ubuntu_Leadership, Safety Culture ^b					
b. Dependent Variable: Employee_Engagement					

Table 20: Coefficients for when safety culture is the moderator (Source: IBM® SPSS and Researchers' Data)

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.126	.169		12.542	.000		
	Ubuntu_Leadership	.540	.051	.595	10.656	.000	.548	1.824
	Safety Culture	.033	.048	.040	.683	.004	.503	1.990
	Interaction_term	-.028	.021	-.057	-1.297	.002	.879	1.137
a. Dependent Variable: Employee_Engagement								

Table 21: Safety culture as a moderator's model residual statistics (Source: IBM® SPSS and Researchers' Data)

Residuals Statistics^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.5942	4.9622	4.3238	.40373	351
Residual	-1.67681	1.50202	.00000	.48820	351
Std. Predicted Value	-4.284	1.581	.000	1.000	351
Std. Residual	-3.420	3.063	.000	.996	351

a. Dependent Variable: Employee_Engagement