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EFFECTIVE COMMUNICATION AS A TOOL TO INCREASE LABOUR ENGAGEMENT DURING UNCERTAIN TIMES IN THE MINING SECTOR

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

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Abstract

Purpose – The paper aims to determine if communication is a determinant of employee engagement in the mining industry. It proposes the communication models that can be used in ensuring that communication becomes effective and fostering a culture of effective communication. It aims to show and discuss the levels of employee engagement in the mining industry and how increased employee engagement can be of benefit to various mining organisations.

Design methodology - This study looks at the cause and effect relationship between company communication and employee engagement. It is a quantitative study and results were collected through a paper filled questionnaire by the targeted sample. The sample consisted of shift bosses, miners, mining operators and others who are directly involved in the mineral winning process. The commodity organisations that participated included coal, gold, iron ore and platinum.

Research findings – The study findings are that 63% of the participants are satisfied with the current communications climate and methods; 78% of the participants indicate employee engagement level. The ultimate finding being that communication contributes up to 24% of employee engagement.

Research limitations – The research is of a cross-sectional manner with data that was only collected between July and September 2017.

Keywords

Effective communication; employee engagement, mining industry

Declaration

I declare that this research project is my own 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. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Bokang Kelepa

Name Signature

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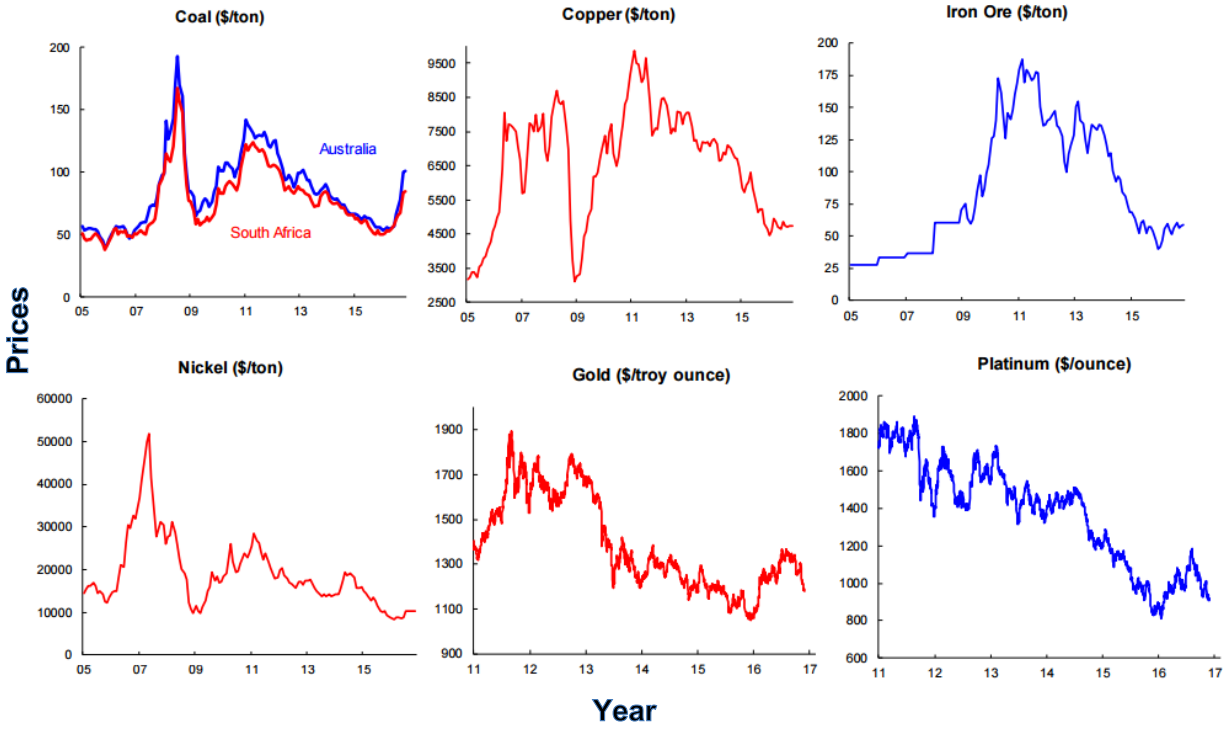
Chapter 1: Introduction and Background of the Problem

1.1. Introduction and Problem Definition

Globally the mining sector has been undergoing changes as a result of uncertainty in the economy, decrease in commodity prices, political instability, and the evolution of other alternatives threatening its very existence. Australia suffered spillover effects where there was a sharp investment slowdown due to China's worsened economy. Brazil was affected negatively due to weakening aluminium prices while Canada suffered the same effects as Australia due to its reliance on the developed world for mineral trade, this affects its growth prospects drastically. (Business Monitor International, 2015; IMF, 2017; Neingo & Tholana, 2016; Schwab, 2017).

South Africa is no different, the sector has been experiencing a decline in profits revenue. According to Neingo and Tholana (2016), the South African mining industry is facing its own challenges that threaten the survival and competitiveness of the industry, this is affecting the profit margins due to rising costs, poor labour productivity, while on the other end the commodity prices have not been favourable of late. Some of these problems have been linked to a lack of sufficient relationships between the managers and employees which has led to strikes and other issues (Business Monitor International, 2013). According to Baxter (2016), platinum output per worker has gone down by 49% and real labour costs/kg went up by 309% between 1999 and 2014. Figure 1 illustrates the performance of the South African coal, copper, Iron ore, nickel, gold and platinum commodities. The graph shows the fluctuating prices over the years with all of them showing a decline in 2013.

Figure 1 Commodity Prices movements (IMF, 2017)



The mining industry is important to the South African country, in 2016 it contributed 7,3% to the country's gross domestic product (GDP), created 457 698 direct jobs while it indirectly supported 4,5 million dependents (Baxter, 2016a).

Considering the declining prices the mining sector has to do something about their productivity. Human capital is important to increase productivity which will in turn increase revenue. One of the ways to increase performance and productivity is to improve employee engagement.

Kahn (1990) in his seminal paper describes engagement as the "Harnessing of organisation members' selves to their work roles physically, cognitively or emotionally and disengagement where people uncouple themselves from their roles and withdraw and defend themselves physically, cognitively or emotionally during performances" (p. 694-695).

According to Kahn (1990), effective communication is one of the tools that builds relationships between the manager and the staff, whilst also ensuring that there is proper engagement and an increase in productivity. In addition, Gallup (2013) in "*an employee*

engagement poll" conducted worldwide in 142 countries found that only 13% of employees were engaged at work between the period of 2011 and 2012.

According to a survey conducted by Kumar, Arasu and Nagarajan (2013), the four key drivers of employee engagement identified were:

- Individuals who are high performers need recognition
- Individuals must have a clear understanding of how their roles fit into the overall strategy
- They must continuously receive updates and strategy communication from the senior leadership,
- The goals of the business must be communicated company-wide and be well understood.

From these priorities, it can be inferred that communication is important for employee engagement and thus will be explored further in this study.

With the issues faced by the mining sector, communication can be applied as a tool to ensure that employees are engaged which will, in turn, increase productivity and performance. Hence the purpose of this study is to explore the possibility of effective communication to improve employee engagement in the mining sector.

Engagement is also strongly attached to worker's productivity (Kumar, Arasu & Nagarajan, 2013). Business Monitor International (2013) indicates that the South African mining sector has one of the lowest margins in the world with wages accounting for 50 – 60% of the mining companies' costs which makes it a relatively less attractive investment destination. This, therefore, indicates that in mining, factors that may have an impact on mines' productivity include high labour costs and a decline in commodity prices

According to Kumar, Arasu and Nagarajan (2013), a highly engaged workforce maximises company's human capital investment, an improvement in productivity can greatly reduce costs such as turnover and all these directly impact the bottom line. Muthuveloo, Basbous, Ping, and Long (2013) agree by saying that employee engagement is critical to the sustainable success of business in contemporary competitive markets and holds a potential to influence to the productivity positively.

It can be inferred from the above that engagement can be used to support productivity positively. As argued by the literature; communication also plays a pivotal role, even though it is not the sole engagement determinant. To this end, this study will focus on exploring the realities around communication and how organisations and mines, in particular, can effectively use communication to improve employee engagement

In this study, the focus is therefore on effective communication as the tool to improve the employee engagement. At this juncture, it becomes important to define 'communication' as well.

Collins Dictionary (2017) defines communication as a two-way process of reaching a mutual understanding where involved parties exchange information, ideas, feelings while also sharing a meaning while Cronje, Neuland, and Reenen (1989) describe communication as a process where a sender transmits a message through a channel to a sender.

Per Nilsson and Pettersson (2013) define communication as being effective if "the different utterances of the interlocutors evoke responses that are in tune with the speakers' meta-discursive expectations". Meta-discursive expectation means that even if the reaction does not contain a specific content but rather it contains content of an expected kind. Sahoo and Mishra (2012) highlight that as much as the employers have expectations from the employees, the notion applies both ways with employees having expectations as well, if any of those expectations are denied there may be a breach of psychological contract between the employer and the employee. This concept will be explored further in the section to follow, drawing links to employee engagement.

1.2. Significance of the Study

With the challenges the mining industry has due to unstable commodity prices, leveraging on labour engagement to increase the overall output at reasonably low costs can be of assistance. To prove this Neingo and Tholana (2016) highlight the severe economic and financial challenges facing mining. These challenges consist of escalating costs, labour unavailability, poor labour utilisation and low productivity per employee. According to Baxter (2016), mining 's GDP contribution has gone down from 2015 to 2016 to 7,3% showing a drop of 4,7%.

The mining industry needs assistance in ensuring that it keeps contributing to the country's GDP and assists in reducing the high unemployment rate. Improving employee engagement through effective communication can be seen as one of the cheap methods in improving the mine outputs requiring less if any capital injection. The increased outputs will be the mines' increased profitability accompanied by better safety statistics. The mines will also see an improvement in the human resources retention through the increased employee engagement.

Labour productivity has been highlighted as a major contributor to the mining decline globally with an average labour productivity has decreased by 44% from 2009 to 2012 (Ernest and Young, 2014). South African mines have had to increase employee wages and according to Ernest and Young (2014) to make up for this, the industry has to look at improving productivity which will also assist during weak commodity price cycles.

Ernest and Young (2014) highlights the increasing labour costs per kilogram of gold mined and a reduction in productivity in kilograms per worker indexed between 1990 and 2012. In order for the industry to regain ground they need to boost their productivity, Kahn (1990) suggests that good employee engagement can play a good role in resolving this. This research allows business to explore the communication element in making this possible.

This study further contributes to the literature. It will add to existing studies geared towards employee engagement and to how communication can be used to have a positive impact on employee engagement.

Carter-Brown (2015) on his research investigated if management or organisational processes were better determinants of employee engagement. The organisational processes are those put in place to ensure that the working climate is conducive to increased employee engagement. The outcome from that was that organisational processes are better drivers of engagement and that organisations should work on developing an organisational climate that is more effective in driving employee engagement. The current study will be looking at effective communication as one of the tools that will assist in the development of this climate.

Mbhele (2016) investigated the relationship between internal communication and employee engagement within a South African government department, listing internal communication as one of the key drivers of employee engagement. The study looked at

the stakeholder approach in the implementation of internal communication in order to improve employee engagement. Some of the key findings were that employees show productive involvement, feel more engaged in the execution of their roles if:

- Employees perceive the information shared with them to be of high quality and reliability
- Communication is a two-way stream
- A positive communication climate is experienced
- Perceived leadership communication is found to be supportive

The employees will show signs of vigour, dedication, and absorption at work. The current study similarly looks at a relationship between communication and employee engagement with the only difference being the context, the government department and the mining sector.

Meyer (2016) examined employee engagement of engineers in South Africa, the antecedents and the outcome variables. The study looked at job fit, affective commitment and psychological climate as the antecedents relating to employee engagement. Meyer's study touches on communication as one of the factors but not in depth, while this study will look at communication as the only element to improve employee engagement.

Hlapho (2015) conducted a study on what the key drivers of employee engagement are in the large platinum mines in South Africa. His findings were that the key drivers were the job design and characteristics, supervision, relationship with co-workers, human resource development practices and the workplace environment. Of interest to the current study is that the drivers of engagement differ with ranks in the working place where the middle managers and the mine operators had similar engagement drivers. The current study covers more of the people on the mining face which are the Shift bosses/Foremen, Miners and operators.

1.3. Purpose of the study

Current research studies on employee engagement have focused mostly on the leadership component as an element to improve employee engagement. Hansen, Byrne and Kiersch (2014) looked at the relationship between interpersonal leadership and employee engagement while Yemeshvary Ashok Upadhyay and Palo (2013) looked at the

engagement of employees through a balanced scorecard implementation, both these studies looked at leadership as the key determinant. These studies have focused on the financial, consulting, education sectors. The findings cannot be comparable to the mining sector which is unique with the issues faced in this industry. Mining is under the spotlight with demands for increased wages, improved productivity, improved safety, employment equity to name a few (Baxter, 2016c). The purpose of the research is to investigate whether effective communication can be used as a tool to drive employee engagement in the South African mining sector. Through the identification of the potential impact of effective communication to drive employee engagement will enable the mining companies to firstly recognise communication as a tool to improve engagement which will ensure productivity and organisational performance; secondly to sensitise mining companies on the importance of developing their managers on communication strategies and thirdly to not allow growth of rumour-mongering amongst the workforce.

Significant emphasis is often placed on leadership and employee rewards to ensure employee engagement (Mayo, 2016; Muthuveloo, Basbous, Ping & Long, 2013; Rana, Ardichvili & Tkachenko, 2014; Sahoo & Mishra, 2012; Taneja, Sewell & Odom, 2015). If however leadership and employee rewards are removed, then effective communication should be considered (Kumar et al., 2013; Rana et al., 2014; Taneja et al., 2015). Whilst there is relatively little research on the impact of effective communication on employee engagement, most of them have focused on technology applications as per Ter Hoeven, van Zoonen and Fonner (2016), therefore examining effective communication as the main tool for employee engagement specifically in the mining sector which is not heavily technologically advanced but still evolving is yet to be examined. This study will, therefore, be of great importance as it will consider effective means to communicate in areas that are not heavily technologized in terms of communication systems. This research will focus on the mining sector in South Africa. The focus will be on skilled individuals in order to capture the view of high-ranking managers and executives. This study will not allow the mining companies to determine other antecedents of employee engagement but will rather focus on the communication component

1.4 Research objectives

The study aimed to see if there was a link between effective communication and engaged employees.

According to Kahn (1990) in the paper titled *Psychological conditions of personal engagement at disengagement at work,* when there is a negative impact on the engagement the following can be seen:

- A decline in the voluntary work attendance
- Self-defensiveness
- Bureaucracy
- Self-estranged
- Estranged workforce
- Effortless
- Lack of empathy
- Refraining from investing ideas
- Lack of excitement/Happiness
- Anxiety
- Negative psychological meaningfulness

All these are definitely unwanted, especially since they are adding to the problem of the low commodity prices. The objectives of the research were, therefore, to determine:

- How effective the communication in the mining industry is
- The drivers of engagement in the mining industry
- The effects of poor communication to employee engagement
- The consequences of lack of engagement to the mining sector

The next chapter looks at exploring the literature in ensuring that the research objectives of the study are achieved.

Chapter 2: Literature Review

2.1 Introduction

Chapter 1 provided an overview of the research problem as well as the research hypothesis, effective communication having a positive influence over employee engagement. Chapter two will provide for an academic literature review, relevant to this study. The literature review will focus on engagement and effective communication, as well as provide for insights on how effective communication and engagement relate to each other and finally, how these can be of use to achieve maximum benefit from the employees so as to benefit the organisation. The literature review will consider existing literature and will highlight any gaps in existing literature.

2.2 Effective Communication

2.2.1 Understanding Effective Communication

Literature offers definitions and thoughts about effective communication. Some of these are given below.

According to Falkheimer (2014) communication is perceived as a process where a sender transmits a message via a channel to a transmitter, this meaning that this does not take into account interpretive factors or sense-making aspects.

Per Nilsson and Pettersson (2013) define communication as being effective if “the different utterances of the interlocutors evoke responses that are in tune with the speakers’ meta-discursive expectations”. Meta-discursive expectation means that even if the reaction does not contain a specific content but rather it contains content of an expected kind.

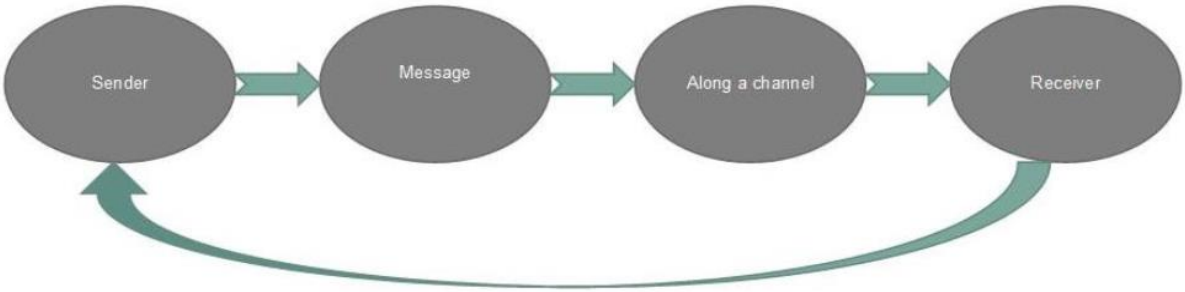
Further, in order to improve communication and to ensure that it becomes effective ”Storytelling to success" (2017) suggests that communicating effectively is done through storytelling. Storytelling encourages collective sense-making where employees assist each other to understand the message being transmitted and this ultimately enhances the potency of the communication. Storytelling can be applied as a tool to spread large and

dense information in a way that can be easily dissected and absorbed across the organisation. Effective internal communication is a backbone of efficiency in each corporation as the lesser the time spent on transferring messages, the more time can be spent on implementation (‘Storytelling to success’, 2017).

2.2.2 Communication Channels and Tools

Cronje, Neuland, and Reenen (1989) describe communication as a process where a sender transmits a message through a channel to a sender as per Figure 2 below. The key point is that communication has to be a two-way process in order to be able to break any barriers (Cronje, Neuland & Reenen 1989). Watson (2013) however highlights the importance of having minimum barriers between a sender and a receiver and further emphasises that communication should be considered as one of the most crucial elements to improve employee engagement. Falkheimer (2014) states that usually communication is taken for granted by not being reflected on, wrong assumptions end up being made as communication may be deemed successful when the recipient has received the message, this may not be the case as interpretation and sense-making will not have been taken into consideration.

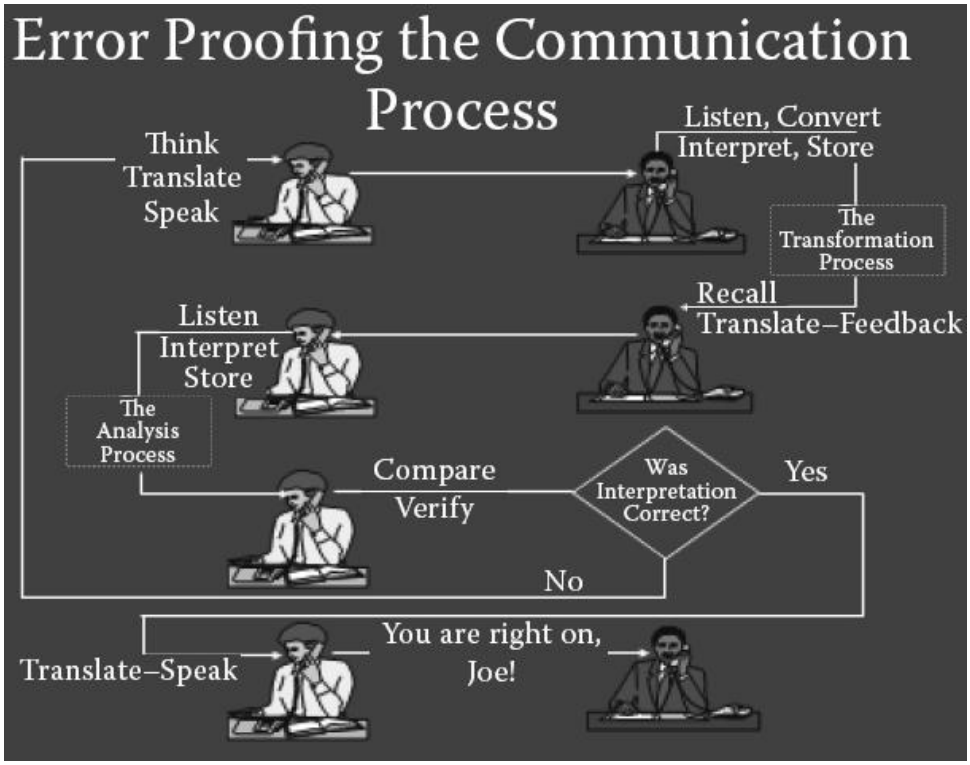
Figure 2 A Simple Communication Model (Cronje et al., 1989)



In understanding communication as a means to improve employee engagement, it becomes vital to investigate where the communication problem lies. Figure 1and Figure 2allows for an opportunity to diagnose where the communication breakdown is, they allow for the improvement of the communication process. This is given in Figure 2 which is a

simple communication model by Cronje et al. (1989) and Figure 3 of Harrington and Lewis (2014) showing the error proofing of the communication process.

Figure 3 Error proofing the communication process (Harrington and Lewis, 2014)



In addition, a study by Togna (2014), in assessing the impact of internal communication to generate trust and increase commitment, it was concluded that communication can be considered as one of the tools to increase engagement. Further adding to that it can be applied to generate trust, as an important foundation for behaviours linked to commitment in the workplace. From the discussion above, it becomes important to consider the concept ‘effective communication’. This is provided in the section below.

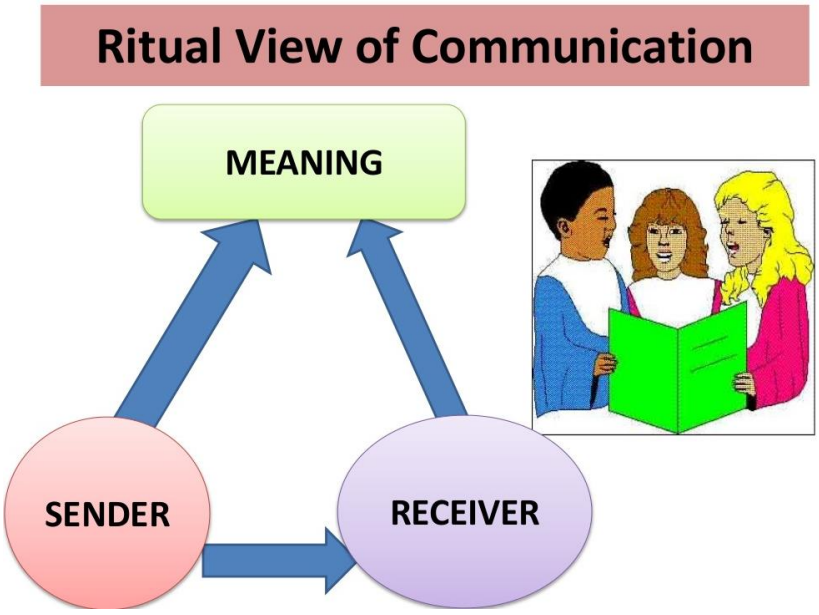
2.2.3 Effective Communication in an organisational context

According to Falkheimer (2014) communication is fairly simple, one just has to find the right words and express them as accurately as possible and select an effective transmission medium.

Falkheimer (2014) explains that if employees do not understand, usually management would apply two principles. The first principle would be to amplify where more, slightly modified better accuracy information is sent. The second principle would be through repetition, where the transmitter will send the same information to the receiver until the receiver can repeat the message.

This highlights the importance of clear, accurate and frequent communication. Falkheimer (2014) makes use of the ritual model; this model is a sense-making approach where humans constantly try to understand communication through interactions with each other. The ritual model is adapted from James W. Carey's ritual model of communication as per Figure 4. This suggests that if the message is not clear the gaps may be filled with false information but if it is accurate it will benefit the company by achieving its intended objective.

Figure 4 Ritual Model of communication by James W Carey (Falkheimer, 2014)



Polito (2013) says that in order to conduct a successful organisational communication one needs to prepare, have a purpose or goal for the communication, practice what you want to convey in an oral setup, manage emotions, listen, and finally ensure timely feedback and follow-up.

2.3. Strategic Communication

Strategic communication is a multidisciplinary field of knowledge, a purposeful communication that involves organization planning and execution to its overall mission in relation to different internal and external stakeholders. The overall aim of strategic communication is to enforce, shape or defend legitimacy inside organizations and between organizations and society. (Falkheimer, 2014)

Frank Cervone (2014) suggests two strategies to improving communication effectiveness, first being the incorporating of appropriate storytelling into communications and secondly communicating in defined patterns known to all the stakeholders. The defined patterns can be of fixed days of communication, agenda and required attendees of a particular meeting

2.3.1 Communication through storytelling

The above discussion indicates that in order to improve communications, incorporation of storytelling is important when communicating. Stories are what engage most people and compel them into action. Stories that are well designed are succinct and bundle essential information with a convincing argument (Frank Cervone, 2014). In communicating by making use of storytelling Pounsford (2017) warns against creating too much mystique around it by over-complicating it. It is suggested that stories should just be simple and relevant in such a way that it will resonate with others. Pounsford (2017) explains that presentations, lists, bullet points and logical arguments are great, but the challenge with them is that they provoke the natural critic in people, where they end up looking for flaws in what is being presented.

Stroud (2015) explains that a human brain processes stories better because they have the beginning, the middle, and then an end; they also enhance memory because they are rich with experience.

Pounsford (2017) explains that stories are able to easily communicate the mission and vision of the organisation or any campaign that you are running. Being able to communicate this will also be helpful in organisations that hire millennials, and even in the 2016 Gallup report titled “How Millennials Want to Work and Live”, it is mentioned that millennials want a purpose for working and do not just work for a pay-check (Gallup, 2016).

2.3.2 Communicate in defined patterns

There has to be mechanisms for communicating information and details to people needing to know. The mechanisms should not appear to be random. An example of this is having regular meetings on set days, this regardless of the length or the recurrence pattern, establishes a consistent mechanism for keeping all members involved and updated. Meetings should focus on action items or decisions that need to be made other than status reports. Where possible, reports should be distributed prior to face-to-face meetings in order to ensure meetings focus on the exceptions rather than the mundane. Active communication methods such as face-to-face meeting, presentations, video conferences and telephone calls are more engaging than passive methods like newsletters, podcasts, and emails. (Frank Cervone, 2014)

2.4 Organizational communication effectiveness constructs

Taking into consideration what has been mentioned above with regards to storytelling and communicating in defined patterns we look how we can apply that in a workplace. Stroud (2015) explains that storytelling makes an effective construct when passing down a message. When communicating through a storytelling Stroud (2015) explains that the story should have elements. The elements can be as follows:

- Start by defining the problem
- Build your characters, the hero, the victim, the villain and the supporting characters. The hero must be the one who is transformed in the story while the victim is the one who ends up being saved by the hero. The supporting characters will be assisting the hero in succeeding. Then the villain should be the agitator.
- Paint the background by introducing the characters
- Describe the setting

- Expose the conflict
- Highlight the climax
- Offer resolution
- Arrange the plot. This can be done by highlighting the events, this assists in achieving different outcomes

2.5 Theories and Frameworks linked to Communication in Organisations

Following the discussion of how to apply organisation communication in the workplace, the researcher looks at different frameworks that are linked to communication in organisation through two frameworks, communication value circle and communication circle.

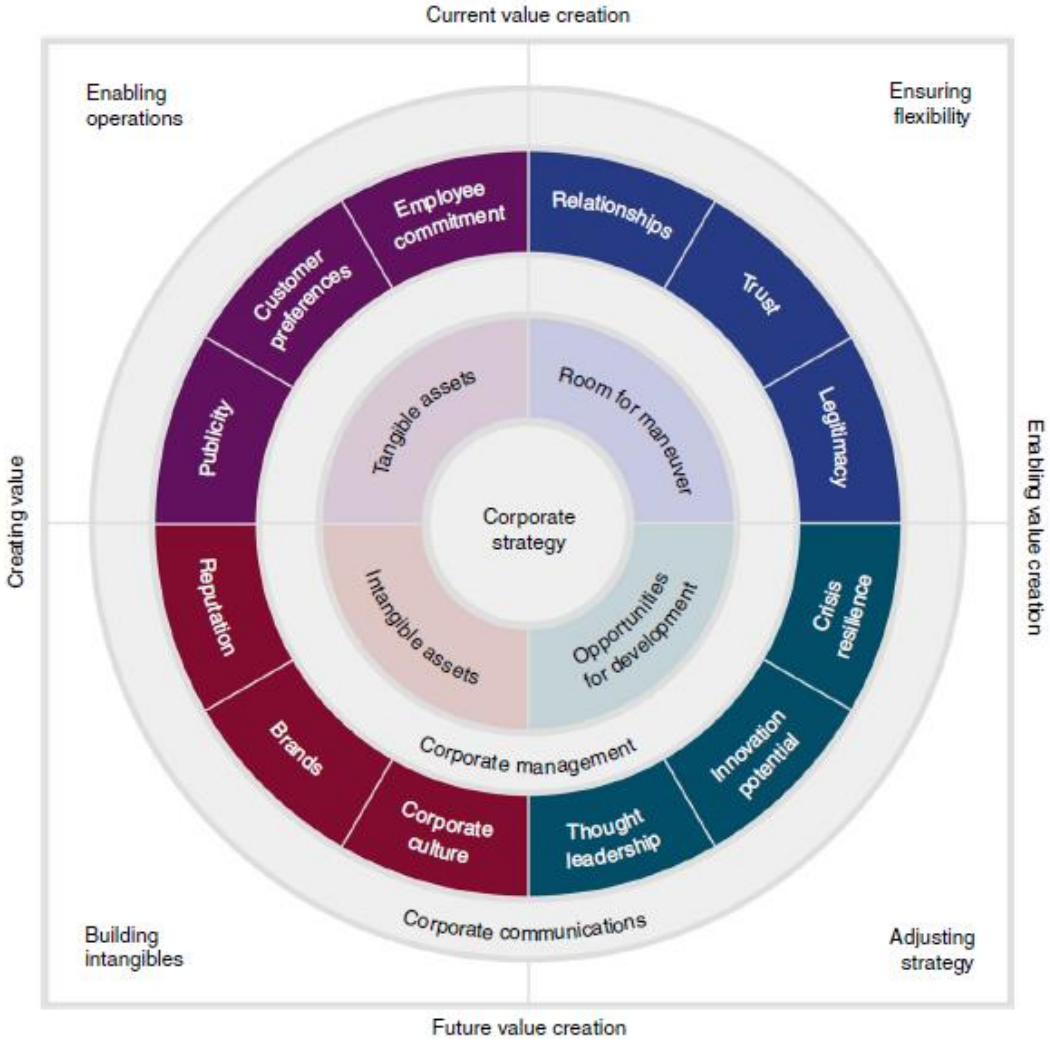
2.5.1 Communication value circle

Corporate strategies prioritise and operationalise four value dimensions into concrete goals based on the specific positioning and resources of a company (Porter, 1985; Steinmann et al., 2013). The dimensions are tangible assets, intangible assets, room for manoeuvre, and opportunities for development as displayed in Figure 5.

Corporate management strives to accomplish these goals. As part of these overall ambitions, corporate communication can support all four dimensions. These dimensions in turn, help to structure the multitude of communication goals identified in the literature. They can be summarised into 12 generic types of communication value as per Figure 5, and four dimensions of what communication actually does to support a corporation's value creation: enabling operations, building intangibles, ensuring flexibility, and adjusting strategy, see Figure 5 by Zerfass and Christine (2017).

This is an interdisciplinary framework that explains the process of value creation through communication at the levels of corporate strategy, corporate management, and corporate communication. The framework combines the generic value dimensions derived from the business literature with key insights from the body of knowledge on value creation through communication.

Figure 5 Communication value circle (Zerfass and Christine, 2017)



2.5.2 Communication satisfaction

Nikolić, Vukonjanski, Nedeljković, HadŽić and Terek (2014) refer to checking of communication satisfaction. So in checking whether your communication efforts are effective; they consider how employees feel about communication efforts and the different aspects of their communication. They make use of a communication satisfaction questionnaire by Downs and Hazen (1977) as per Table 1 below. By conducting this questionnaire an organisation can give a feedback to employers and managers about their communication methods from eight perspectives outlined in Table 1.

Table 1 Communication Satisfaction questionnaire by Downs and Hazen (Nikolić, Vukonjanski, Nedeljković, HadŽić & Terek 2014)

Organizational Perspective	It deals with the broadest kinds of information about the organization as a whole.
Personal feedback	It is concerned with the workers' need to know how they are being judged and how their performance is being appraised
Organisational integration	It revolves around the degree to which individuals receive information about their immediate environment.
Supervisory communication	It includes both the upward and downward aspects of communicating with superiors.
Communication Climate	It reflects communication on both organizational and personal levels.
Horizontal communication	It concerns the extent to which co-workers and informal communication are accurate and free-flowing.
Media quality	It deals with the extent to which meetings are well-organised, written directives short and clear, and the degree to which the amount of communication is adequate.
Subordinate communication	It focuses on upward and downward communication with subordinates. Only workers in supervisory positions respond to items related to this dimension.

The study that Abu Bakar and Su Mustaffa (2013) did, show that job satisfaction may be enhanced by organisational communication construct, the flow of information,

communication climate, characteristics of the message, structure of communication, group bond and mutual respect.

Having discussed communication the discussion to follow will be on employee engagement.

2.6 Employee Engagement

The section above discussed communication and how it can be made effective, the current section looked at employee engagement.

2.6.1 Understanding Employee engagement

Swarnalatha and Prasanna (2013) define employee engagement as the level at which employees commit to something or someone in their organisation, the effort they put in their work and the length of their stay as a result of that commitment. By this it means that engaged employees will have a high commitment to their role in their organisation, this will be translated through the effort and commitment of extra hours to ensure that intended results are achieved. This also translates into low turnover in the organisation as per Kumar et al. (2013).

Swarnalatha and Prasanna (2013) are of the notion that there is a connection between an employee role in the organisation and the strategy of the organisation, including the comprehension in terms of the role of the employee in the organisation, with reference to the most imperative driver of employee engagement. In support, Kumar et al., (2013) emphasises the importance of aligning the organisational strategy and the role of the employee, followed role-organisation alignment on the second position with the first being the recognition being given to high performers. Both authors indicate communication as crucial, but not as the leading factor.

Saks and Gruman (2014) in their study on employee engagement conclude that engagement is psychologically, emotionally and physically present when performing employment role. Supporting this view is Kahn, (1990) who states that people based on their psychological experiences of their self-in-role will turn to defend their preferred selves. Kahn (1990) defines the psychological meaningfulness being a feeling that one receives as a return on them giving themselves in a currency that is a form of physical, cognitive, or emotional energy. People experience this psychological meaningfulness when they are made to feel worthwhile, useful and of value and their efforts are not being

taken for granted (Kahn, 1990). Kahn (1990) says the psychological meaningfulness of employees can be affected by a clear communication between themselves and the employer.

2.6.2 Levels of engagement

According to Gallup, (2013) and Towers Watson (2013) employee engagement can be grouped into three levels. Gallup, (2013) differentiates this as engaged employees, employees not engaged, and employees who are actively disengaged. Alternatively, Towers Watson (2013) depicts them as highly engaged employees, unsupported employees, detached employees, and disengaged employees. Towers Watson (2013) is of the notion that each level of engagement has different treatment levels; therefore the identification of levels of engagement in the particular field becomes necessary as the treatment will not be similar.

Here there is a need to explore poor engagement and the effects thereof. Gallup (2013) defines poor engagement in two levels, actively disengaged and not engaged. When employees are not engaged it means they lack motivation and they are less likely to invest voluntary efforts in organisational goals. When they are actively disengaged they will indicate their unhappiness by being unproductive at work while they also spread negativity to co-workers.

Effects of poor engagement emancipate in the following ways according to Togna, (2014):

- Dissatisfaction of employees with their jobs
- Employees experience high-level employee attrition, they tend to resign and leave for other employers as soon as the opportunity arises.
- There is inconsistency in employees in terms of loyalty, creativeness and energy that they apply in their jobs
- There tends to be low goodwill for the company when they are within or even outside it. This, therefore, tends to give the company a negative goodwill.

With these points the company is affected in the following ways:

- Company loses talent
- The organisation success is impacted on negatively due to lower yields of its output

2.6.3 The evolution of employee engagement

According to a study done by Dagher, Chapa and Junaid (2015) on the historical evolution of employee engagement, the concept of employee engagement started around the 1970s and gained recognition with the Kahn's "Psychological conditions of personal engagement and disengagement at work" in 1990. The table below gives a summary of how employee engagement has evolved since it was established as a concept.

Table 2 Historical evolution of employee engagement (Dagher et al., 2015)

Author(s) (Year)	Focus point and perspectives/Definition

Frederick Taylor (1976)	Noted as the most important pioneer. His motive was to increase productivity through employee engagement through cooperation, harmony and combined intellectual work.
Lillian Gilbreth (1978)	She examined the human element by doing the time and motion study. She established that to improve employee engagement workers need to be included in decision-making, have a sense of security and be interested in their job.
Khan William (1990)	Khan (1990) revised the previous studies and defined engagement as harnessing of organisational members' selves to their work roles, when individuals are engaged they apply and express themselves emotionally, cognitively and physically. The study focussed on employee engagement identifying safety, availability and meaningfulness as psychological conditions necessary for improved employee engagement.
Malachi, Schaufeli and Leiter (2001)	The focus of the study was on the burnout and job engagement concepts. The study identified six areas leading to burnout and poor engagement with the most important being poor job fit (mismatch). It identifies engagement as characterised by energy, involvement, and efficacy.
Rothbarrd (2001)	Focus on engagement as the cognitive availability and the amount of time one spends on a role and absorption thoughts
Dvir et al. (2002)	Refers to engagement indication by high levels of activity, initiative and responsibility
Harter et al. (2002)	Engagement as the individual's involvement and satisfaction and work enthusiasm
Schaufeli et al (2002)	Engagement as a positive, fulfilling, work-related state of mind characterised by absorption, dedication and absorption
Hater et all. (2003)	Looks at engagement as an involvement with, commitment to, and satisfaction towards work.
Colbert et al. (2004)	Engagement as the high internal state of motivation.
Wellins and Concelman (2005)	Engagement as an illusive force that influences employees levels of performance

Erickson (2005)	Engagement being about passion, commitment and willingness to invest oneself in a voluntary effort to assist the employer to succeed
Saks (2006)	The study identified that engaged employee will display an emotional connection and mental absorption when performing their duties and responsibilities.
Mathieu et al. (2006)	Looks at engagement as an authority and responsibility experience
Garber (2007)	Adding to Taylor's findings the findings were that a major principle of employee engagement is to give employees clear expectations and feedback in order to have increased employee engagement.
Bakker and Demerouti (2008)	Engaged employees possess high levels of energy and enthusiasm about their work
Bakker and Demerouti (2008)	Engaged employees have a sense of energetic and effective Connection activities in their work as themselves as self-sufficient to deal with their jobs demands.
Shimazu and Schaufeli (2009)	"Engagement as a unique concept that can be best predicted by the resources in your job, personal resources and can be predictive of psychological/physical health, proactive organisational behaviour, and job performance"
Schachter (2010)	The study emphasises the need for rewards as it will create greater employee willingness to perform and improve their skills.
Grachev and Rakitsky (2013)	Revised Taylor's model concluding that it was created to increase productivity using employee engagement through cooperation, harmony and combined intellectual work.

2.6.4 Importance of Employee engagement in organisations

Where there is high employee engagement, employees uphold the organisation values and improve its overall performance. Increased employee engagement is crucial to the long-term survival of any business as it allows for performance excellence and a successful global positioning. With the unprecedented changes taking place in the global markets, organisations are able to have an unlimited existence. This therefore, highlights

the increased importance for organisations to attract, engage, develop and build engagement and loyalty among their employees in order to gain a competitive edge in the current global marketplace (Taneja, Sewell & Odom, 2015).

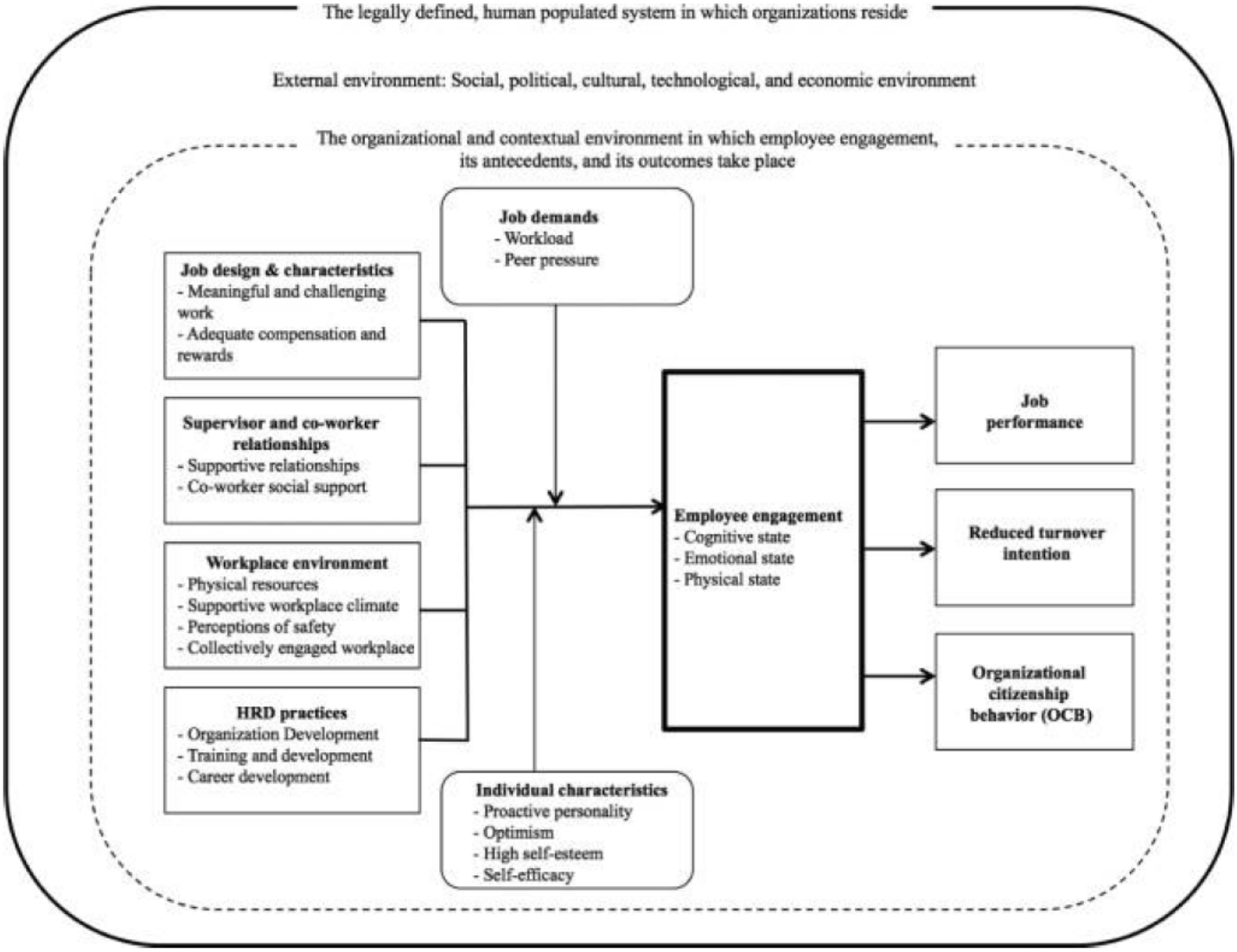
Companies that have a high employee engagement show 22% higher profitability, 10% relatively higher customer satisfaction, 28% decreased theft and 48% lesser accidents in the workplace (Gallup, 2013). This is supported by Taneja, Sewell and Odom (2015), indicating that positive relationship has been found between employee engagement and organisational performance outcomes like employee retention, productivity and profitability.

According to Swarnalatha and Prasanna (2013), a key driver for organisational success and sustainability is dependent on employee engagement. Engagement has a potential to contribute to employee retention, loyalty and productivity, these factors in turn result in customer satisfaction, company reputation and overall stakeholder value (Swarnalatha & Prasanna, 2013). Sahoo and Mishra (2012) believe that successful employee engagement does not only build a committed workforce but rather a committed community organisation wide.

2.6.5 Factors that influence employee engagement

The model in Figure 6 below explains the antecedents and outcomes of employee management. The left side indicates the antecedents which are the inputs determining the employee engagement while the right side shows the outcome from the employee engagement. When the inputs are positive they are more likely to yield a good employee engagement. The people should feel that they have a meaningful and challenging work, they are adequately remunerated, and there is a supportive relationship between themselves and their supervisors and their colleagues. In ensuring the development of employee engagement constant interactions and communication are required (Rana, Ardichvili & Tkachenko, 2014).

Figure 6 A theoretical model of the antecedents and outcomes of employee management (Rana et al., 2014)

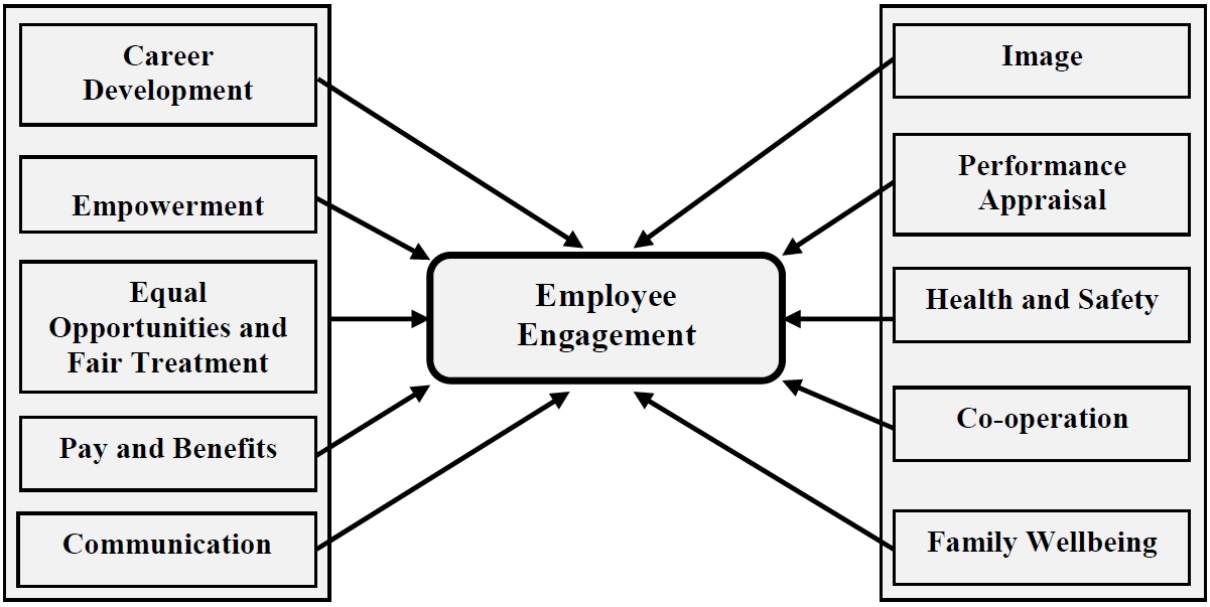


Taneja, Sewell and Odom (2015) suggest that the following factors are the top drivers of engagement globally:

- The promotion of involvement within the organisation
- Focussing on the customers;
- Democratising of the workforce;
- Supporting work-life balance; and
- Rewarding of employees.

The model in Figure 7 below indicates the factors influencing employee engagement. It provides that communication should be part of the organisation culture as it builds trust, confidence, ensures alignment, low ambiguity while also keeping success stories alive for the existing and new incoming employees. Further, clear and consistent communication allows the employees to part of decision making, which translates into sharing of power through participative decision making. This induces belongingness feeling which increases engagement. (Sahoo & Mishra, 2012)

Figure 7 Key drivers of employee engagement (Sahoo & Mishra, 2012)



Sahoo and Mishra (2012) suggest that employees can be communicated with in the following manner so that they may feel their involvement in the organisation:

- Mass contact exercise

  The senior management must consistently meet on a weekly basis with the employees; discuss the organisation priorities on a face-to-face basis. They must make presentations spelling out achievements and shortcomings and then pointing out where thrust is required. Then employees should be given an opportunity to say how they are going to contribute to overcoming the shortcomings.

- Performance excellence workshops

This is done departmentally where a senior manager along with other key members from the support services within the organisation sit with the employees and engage in a highly interactive workshop. Here employees not only provide difficulties but also come out with concrete implementable suggestions involving their own actions.

2.7 Theories and Frameworks linked to Employee engagement

Having discussed employee engagement, this section looks at various theories frameworks linked employee engagement.

2.7.1 Psychological meaningfulness

In addition, based on the above literature review according to Saks and Gruman (2014), different levels of engagement are affected differently based on varying psychological conditions. Psychological conditions include meaningfulness at work, meaningfulness in work, safety, and availability of psychological resources. It may be inferred that during instability in the mining industry, employees may experience negative psychological meaningfulness due to them concluding that their efforts are not recognised and therefore they are not worth much value to the company. Kahn (1990) explains that such persons will only engage when there is psychological meaningfulness, which is the feeling that one receives as a return on investments on one's self in a currency of physical, cognitive, or emotional energy. People experience this meaningfulness when they are made to feel worthwhile, valuable, useful, not taken for granted and feel that they are making a difference.

Figure 8 outlines the job resources and job demands, psychological condition, and engagement type.

Figure 8 JD-R model showing how job resources and demands influence psychological conditions (Saks & Gruman, 2014)

So when an organisation is going through instability, people's mindsets are affected due to the discomfort of the unknown. Kahn (1990) supports this with a statement that people's discomfort with managerial environment security may set limits on how safe they feel in employing and expressing their selves. An unstable environment may affect psychological availability. Kahn (1990) defines the Psychological availability as the feeling of possessing physical, emotional or psychological means to personally engage at any given moment. Kahn (1990) says it is used to measure how ready people are to engage, given any distraction they may be experiencing as members of the social system.

2.7.2 Engagement as a function of connecting the hands, heads and hearts of employees

Rao (2017) defines employee engagement as a function of connecting employees' hands, heads, and hearts with the vision and the mission of the company; a state where individuals are emotionally and intellectually committed to the organisation by three major behaviours, what they say, what they do, and by their strive. The head represents how an employee connect with the organisation's goals and values, the heart talks to the employee 's emotional connection to the employer, linked with the pride the employee takes with regard to the organisation and the hand refers to employee's willingness to put in a great deal of extra effort to help the organisation succeed. Kahn (1990) supports this by stating that people bring and take themselves from particular task behaviours. The aim is therefore, to ensure that they always bring themselves in their roles to achieve maximum results out of each.

2.7.3 Job engagement

Hansen, Byrne and Kiersch (2014) refer to job engagement defining it as a fulfilling, positive, job-related state of mind characterised by dedication, vigour and absorption. Vigour is important here as it means there are high levels of energy and mental attribution to the work being done. This is particularly important in the mines that show declining productivity and increased safety incidents as per Baxter (2016b).

2.8. Effective Communication and Employee Engagement

The literature up this far has looked at communication and engagement, in this section the literature builds a relationship between the two.

2.8.1 Impact of effective communication on employee engagement

Organisations need to ensure that there is clarity on employee expectations towards them aligning to achieving the organisational goals. Managers need to clarify what employees are committing to and importance of such. This communication will ensure alignment and engagement drivers to achieve higher levels of engagement and contribution. (Taneja et al., 2015)

From the global employee engagement results, it becomes clear that employee engagement is a problem in South Africa. Kumar et al. (2013) survey conducted on "*Most impactful employee engagement drivers"* shows communication frequently as one of the most impactful engagement drivers, the three covering communication were: Recognition for high performers

- Clarity of individuals role fitting in the overall company strategy
- Continual updates and strategy communication by senior leadership
- Company–wide communication and understanding of the entity goals
- Alignment of individual staff goals with corporate goals

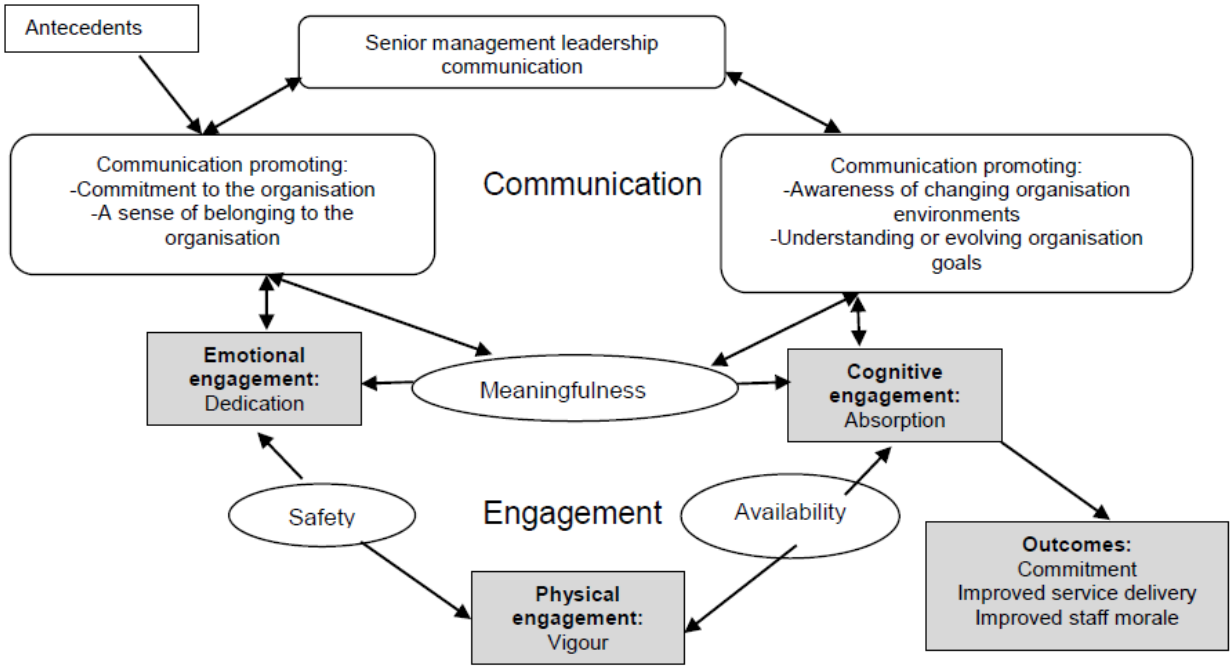
The two, Kumar et al. (2013) and Swarnalatha and Prasanna (2013) show that communication is not the only aspect to help in the engagement problem but it is definitely one of the aspects.

2.8.2 Relationship of effective communication and employee engagement in an organisation

Taneja et al. (2015) make use of the acronym CARE to show the importance of communication with regard to employee engagement improvement. They say that the managers of an organisation should care, with CARE representing C – Coach; A- Align; R- Recognise and E – Engage. Employees want to be engaged in the decision-making processes affecting their work, allowing them to be heard has proved to have a positive effect on their engagement levels, making them high (Sahoo & Mishra, 2012).

Mbhele (2016) in his dissertation makes use of the "*Internal communication and employee engagement*" model as per Figure 9 to describe the relationship between communication and engagement. The model has three engagement components, emotional, physical and cognitive. Communication is shown as an antecedent to all these forms of engagements which in turn covers Kahn's 1990 psychological conditions of engagement, safety, availability and meaningfulness.

Figure 9 Internal communication and employee engagement model (Mbhele, 2016)

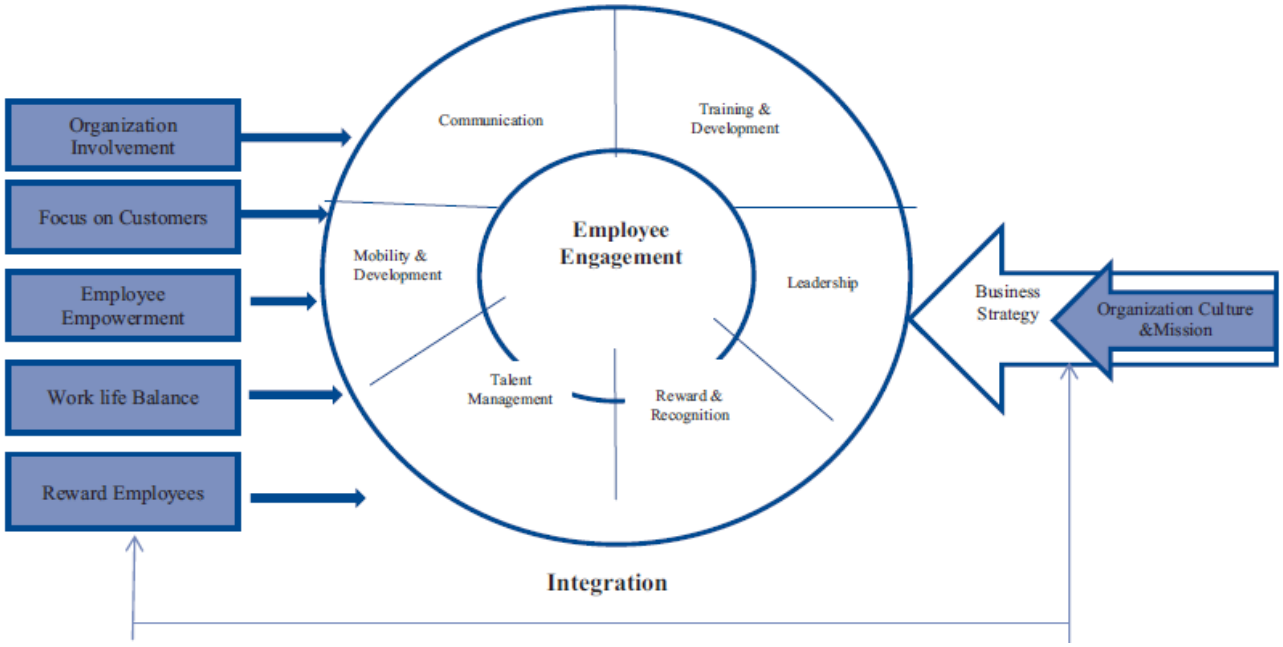


2.7.3 Frameworks of Effective Communication and Employee Engagement

Taneja, Sewell and Odom (2015) in their model, given in Figure 10 below, explain the necessity for alignment and integration as they are the keys to success and effectiveness

for employee engagement. Figure 10 shows the strategies necessary in creating a culture of employee engagement, communication forms one of the six core elements. This then shows how important it is to ensure that communication methods are not undermined.

Figure 10 Creating sustainable strategies for employee engagement for global managers (Taneja, Sewell and Odom, 2015)



With engagement and communication having been discussed the next section will look at the four commodities where the study took place. This will assist the reader in understanding the context of where the study took place which will bring clarification of the necessity of this study.

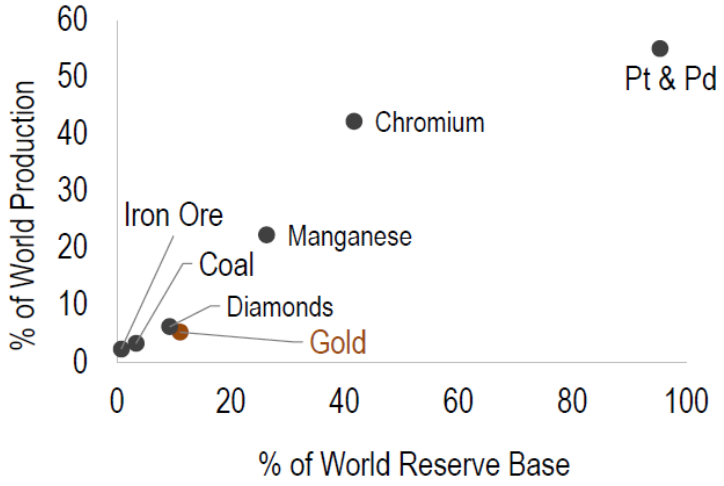
2.9 The Mining Industry

South Africa ranks top 10 in the global production of Platinum Group Metals (PGMs), gold, coal and chromium. South Africa holds 5% gold, 2% Iron ore, 3% coal and 55% total market share of the global commodity production and reserves as indicated in Figure 11. In 2015 the South African mining industry contributed 7.7% to the country GDP, 15% to foreign direct investment, 20% of private investment, 1.4 million jobs and 25% of exports. Mining's economic contribution goes beyond direct employment; its expenditure on resources produced and retained jobs in agricultural, manufacturing, finance and

construction sector. In 2016 it spent a total of R211.8 billion on various goods and services. In their operating communities, they have built schools, clinics, hospitals and by this improving the quality of community members. All these indicate the importance of mining to the country and hence its survival should be ensured.

(Baxter, 2016b)

Figure 11 South African Commodity Market Share (Baxter, 2016b)

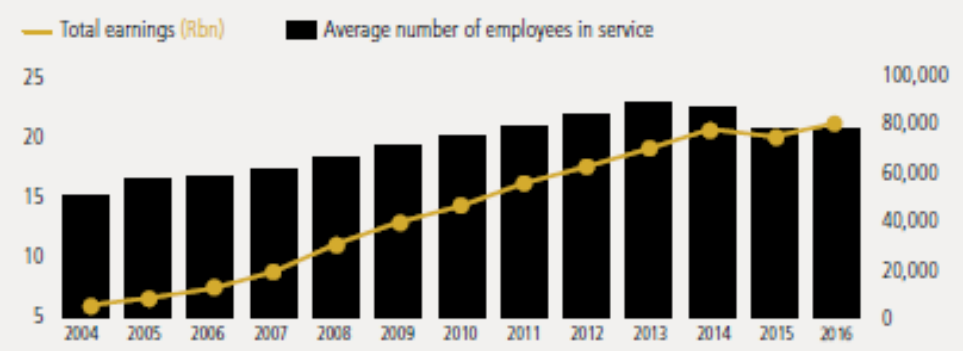


2.9.1 Coal mining sector

South Africa derives 70% of the energy requirements from coal, that is for both electricity and liquid fuels. Globally approximately 41% of total world electricity generation is from coal. Since 1993 coal revenues have been 50% export and coal export earnings have averaged 12% of total merchandise exports. Every year coal production has increased due to continuously growing demand. All these highlight the importance of this commodity to the country. Like other commodities coal industry employee‘s wages have gone up, being at +/- 16% from 2004 to 2016 as per Figure 12.

(Baxter, 2016a)

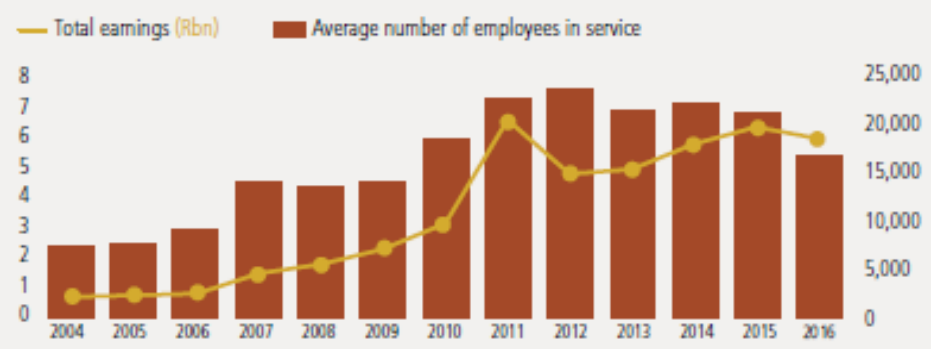
Figure 12 Employment and earnings-South African coal mines (Baxter, 2016a)



2.9.2 Iron ore mining sector

Globally South Africa has less than 1% of iron reserves but produces close to 5% of global exports. Baxter (2016a) in Figure 13 shows that the amount of Iron ore sector wages has been going up while the number of employees has been going down, this leads to a decline in iron ore production, especially when combined with the low productivity.

Figure 13 Employment and earnings of the Iron ore mining sector (Baxter, 2016a)



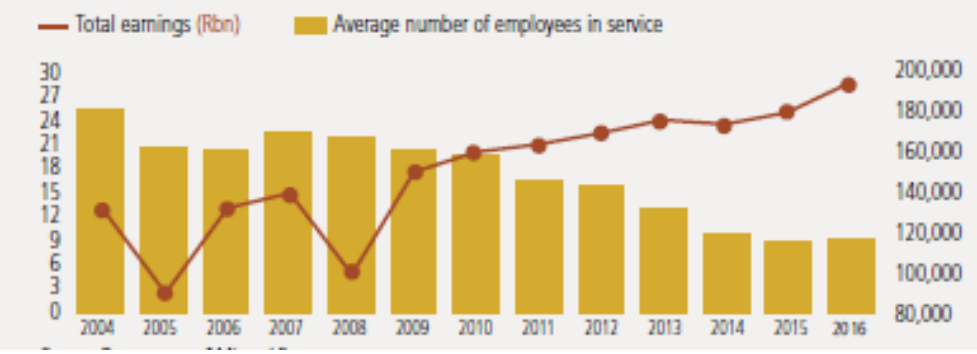
2.9.3 Gold mining sector

South Africa has been the leading producer of Gold for over a century, and that remained until 2009 despite its production declining from a 1 000 tonnes to 342 tonnes of gold mined per annum (PwC, 2014). South Africa had been the leading producer until 2009 where it stood in the 5th position after China, Australia, Russia and USA (Neingo & Tholana, 2016).

Neingo and Tholana (2016) highlight price volatility, increasing costs in production, declining grades, increased mining depth, labour instability, low labour productivity and political, social, and environmental issues as challenges in the mining sector.

Baxter (2016a) in Figure 14 shows that the amount of Gold sector wages has been going up while the number of employees has been going down, this leads to a decline in gold production, especially when combined with the low productivity.

Figure 14 Employment and Earnings - South African Gold Mines(Baxter, 2016a)

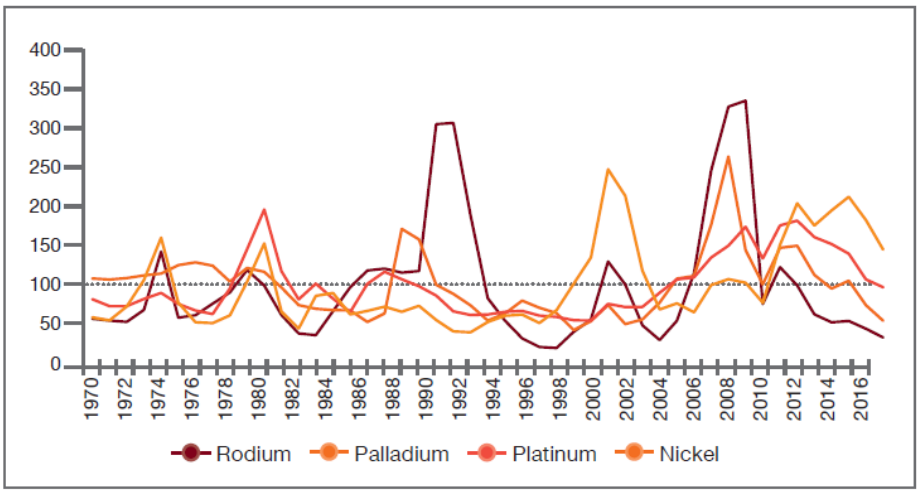


2.9.4 Platinum Mining Sector

According to Kotze and Rossouw (2016) South Africa provides more than 70% of primary mined platinum supply and 55% of total supply including recycling.

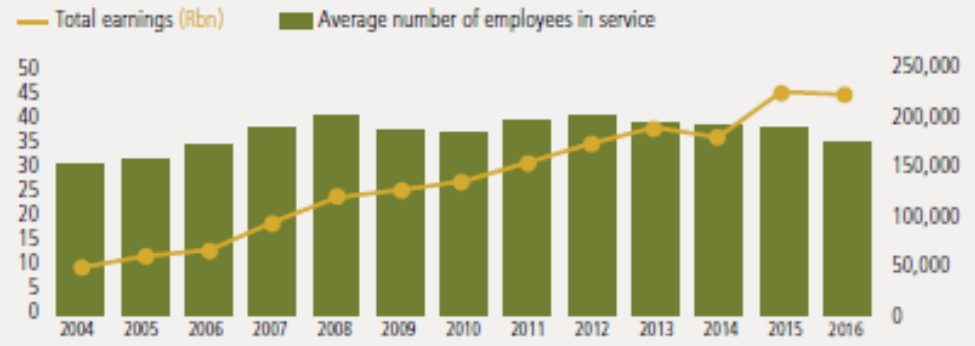
Kotze and Rossouw (2016) explain that platinum's revenue is not made only of platinum but also of its by-product palladium, rhodium and nickel, in fact on average palladium is trading above platinum as per Figure 15.

Figure 15 Platinum group metals prices (Kotze & Rossouw, 2016)



Baxter (2016a) in Figure 16 shows that platinum employee earnings have grown at an average of 16.4% between 2005 and 2016. Unfortunately, this does not match the productivity rate which has since then been declining according to Baxter (2016).

Figure 16 Employment and Earnings - South African Platinum mines (Baxter, 2016a)



With the four commodities that have been discussed along with their challenges, the next section will look at how employee engagement can be leveraged on as an opportunity in resolving the challenges.

2.10 Importance and benefits of employee engagement in the mining sector

Based on the literature given on the four commodities it is clear that productivity has declined while the costs have increased. Kahn (1990) and Swarnalatha and Prasanna (2013) indicates the importance of employee engagement in dealing with these, increased

employee engagement increases productivity and also reduces costs. Productivity on both a volume and a cost perspective has been on a decline since 2000, in addressing this, employers have implemented various cost-cutting exercises and point solutions (Ernest and Young, 2014). Both Kahn (1990) and Muthuveloo et al. (2013) say that increasing the employee engagement will see the reduction in the effects that come along due poor employee engagement. Kahn (1990) and Muthuveloo et al. (2013) support each on the following behaviours observed as signs of low engagement levels:

- Anxiety due to uncertain future
- Lack of trust between employees and the line management
- High labour turnover due to job security uncertainty where one may lose the best people
- Increased safety incidents due to perceived disturbed mental state
- High absenteeism with people looking for better alternatives
- Low productivity
- Low morale
- Reduced voluntary work attendees
- Tension between workers and management

2.11 The impact of employee disengagement in the mining sector

Baxter (2016) ‘s findings indicate that there is still a lot of mineral resources that requires conventional mining methods and further highlighting the importance of capitalising in improved employee engagement to be able to mine these resources while also remaining globally competitive.

The following challenges identified by Baxter (2016) indicate the need for improvement in employee engagement:

- Global commodity prices have fallen drastically with exception to gold
- Wages have gone up by over 10% in the past 5 years
- The prices of raw materials by greater than 10% while the steel price has gone up by 12%
- Employment has declined
- The platinum output per worker has declined by 49%, labour costs per kilogram went up by 309% between 1994 to 2014

- Instability in the labour market
- Stoppages due to safety aspects by the regulatory body, Department of Mineral Resources (DMR)

The mining sector leaders have committed to zero harm to all mine employees. Although the safety statistics show an improvement the zero-harm target is not yet met. In 2016, 73 fatalities were recorded with the majority of them coming from the gold and platinum sectors.

(Zwane, 2017)

Kahn (1990) points out that, accidents are caused due to perceived disturbed mental state and ensuring an increased employee engagement reduces that.

2.12 Relationship between effective communication and employee engagement in the mining sector

In the government‘s efforts to ensure that safety statistics meet the targeted zero harm goal the first aspect is through communication. There is a stakeholder collaboration where the Department of Mineral Resources (DMR) engages and collaborates with its social partners. The main aim for this is to ensure that the health and safety of the mine employees is prioritised. (Zwane, 2017)

With improved communication between all the stakeholders being one of the intervention tools the fatalities have reduced from 615 to 73 fatalities a year since 1993. This was made possible by the safety initiatives adopted by the mining industry collaborating with the Chamber of Mines of South Africa under the auspices of the Mine Health and Safety Council. Individual mines do joint planning, decision-making, training and auditing in the aspects of safety and health in the workplaces. (Chamber of Mines of South Africa, 2016)

With the literature being covered the next chapter; Chapter 3 will look at the research hypotheses for this study.

Chapter 3: Research hypothesis

Based on the research objectives mentioned in Chapter 1 and the literature presented in Chapter 2, three research hypotheses have been formulated.

3.1 Research scope

The study aimed to focus in the mining industry within South Africa focussing on effective communication as an engagement tool. The research was conducted in the mines that were experiencing instability due to the uncertainty in the economy as described above by Business Monitor International (2013) and International Monetary Fund (2013).

While there are multiple factors that affect engagement (Kumar et al., 2013) outline the following as the most crucial:

- Recognition being given to high performers
- Individuals having a clear understanding of their job role contribution to the company strategy
- Continuous updates from senior leadership
- Ensuring that company goals are communicated and understood across the organisation
- Individual staff goal in line with the overall company goals

This study however, considered the impact of communication on employee engagement.

3.2 Research motivation

Large organisations needed to remain afloat in the recent economic downturn as described by Business Monitor International (2013). Some approaches to ensure this were the implementation of a flat unit cost year on year in reducing costs, the increase in production, and letting go of other operations (Cutifani, 2014). Kumar et al. (2013) explains that a positive employee engagement could also be part of the solution as it reduces costs while it also increases productivity The statement is also supported by Muthuveloo, Basbous, Ping, and Long (2013) stating that employee engagement is critical to the sustainable success of business in contemporary competitive markets and holds a potential to influence to the productivity positively.

In reacting to mining instability, In Mining Weekly (2017) Mark Cutifani mentioned that the selling of the Eskom tied mines was still part of the strategy of reshaping Anglo American assets. The reshaping saw an organisational restructuring where some jobs were lost and some mines in Australia and South Africa being sold as per BMI (2015). The research helped to determine if better engagement of employees could have helped to avoid this and if it could assist in harnessing the situation from becoming worse.

Kahn (1990) and Muthuveloo et al. (2013) support each on the behaviours observed as signs of low engagement levels being anxiety due to uncertain future, lack of trust between employees and the line management, high labour turnover due to job security uncertainty where one may lose the best people, increased safety incidents due to perceived disturbed mental state, high absenteeism with people looking for better alternatives, low productivity, low morale, reduced voluntary work attendees and tension between workers and management.

3.3 Research hypotheses

With the challenges in the mines mentioned above and the attempt to solve them through employee engagement the research hypotheses have been developed. Saunders and Lewis (2012) define the research hypothesis as a testable proposition stating that there is a significant difference or relationship between two or more variables. With this, the main hypothesis was developed which evaluated the effect of effective communication on employee engagement. Blumberg, Cooper and Schindler (2014) explain that hypothesis tests whether the theory advanced using deductive reasoning is confirmed for a particular setting, which in this study was in the mining industry.

3.4 Research hypothesis One:

The hypothesis was aimed to deduce if effective communication existed in the South African mining industry. Therefore the hypothesis was as follows:

H_{01}: *There is no effective communication at the mines in South Africa*

H_{11}: *There is an effective communication at the mines in South Africa*

Hypothesis one has a sub-hypothesis which will looked at the effective communication existence among the various biographic groups. The sub-hypothesis for hypothesis 1 is as follows:

H_{01b}: There are no differences among the biographic groups on effective communication

H_{01b}: There are differences among the biographic groups on effective communication

3.5 Research hypothesis Two:

The hypothesis was aimed to deduce if there was employee engagement in the South African mines. Therefore it was follows:

H_{01}: There is no employee engagement in the mines in South Africa

H_{11}: There is employee engagement in the mines in South Africa

Hypothesis two has a sub-hypothesis which will look at the employee engagement existence among the various biographic groups. The sub-hypothesis for hypothesis 2 is as follows:

H_{01b}: There are no differences between the biographic groups on employee engagement

H_{01b}: There are differences between the biographic groups on employee engagement

3.6 Research hypothesis Three:

The third hypothesis will look if effective communication has an effect on the employee engagement. The hypothesis is therefore as follows:

H_{01}: Effective communication at the mines has positive influence over the employees' engagement

H_{11}: Communication at the mines has no influence over the employees' engagement

The next chapter looks at the research methodology that will be used to attain the results for this study.

Chapter 4: Research Methodology

In Chapter 3 research questions and hypotheses were formulated, Chapter 4 describes the methodology that was followed in undertaking the study.

4.1 Research setting

The research was conducted in four different commodity mines, namely, coal, gold, iron ore and platinum with the geographical boundaries being within South Africa.

4.2 Research methodology

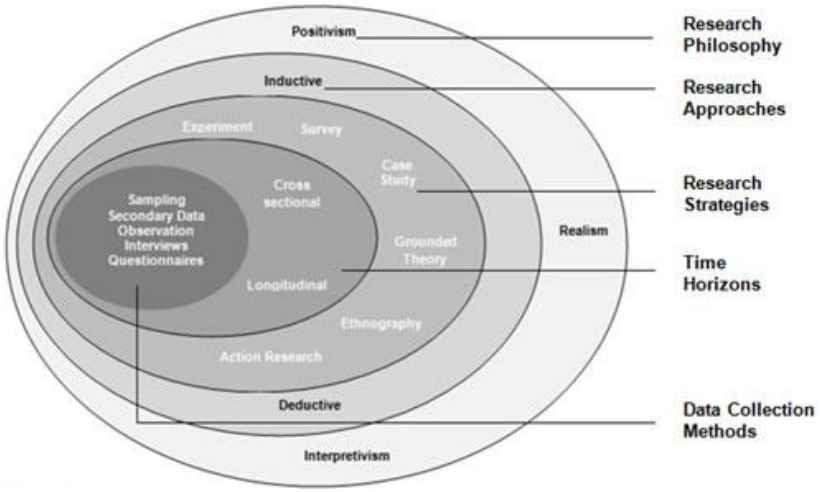
The proposed research methodology utilised was the quantitative one since it made use of numbers (Zikmund, Babin, Carr & Griffin, 2010). The numbers used were in a questionnaire format making use of the Likert scale adapting it from Hlapho (2015) and Mbhele (2016) ‘s dissertations. The questionnaire had three aspects to it, one capturing the biographic information, the second being on effective communication, and the last one being in effective communication. The Likert scale had 5 ranks running from 1 until 5 with the following options, 1- Strongly disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly agree. Saunders and Lewis (2012) explain quantitative data to be that containing numbers or simply the data that has been quantified like tables and figures.

The research was an Explanatory study and this being because it follows Saunders and Lewis (2012) ‘s description, of the researcher looking for an explanation of results by determining if there is a causal relationship between the key variables. For example, the study checks if there is a correlation between communication and employee engagement.

4.2.1 Interpretivism

The choice of methodology was adopted from Saunders and Lewis (2012) which followed the onion layout, Figure 17. The philosophy followed was interpretivism. Saunders and Lewis (2012) explain that it relates to social phenomena study in their natural environment. Here the researcher wanted to understand if their observations were an indication of a negative employee engagement of the workforce due to instabilities and if effective communication can be a solution to it.

Figure 17 The research onion(Saunders & Lewis, 2012)



The approach was a deductive one based on the testing of communication and engagement theory. Saunders and Lewis (2012) state that deduction research involves the testing of the theoretical proposition by using research strategy designed to perform the test. This was looking if the situation at the mines fitted the theories described. The method was relevant since the study was deducing if the engagement and communication theories discussed are actually in existence at the mines.

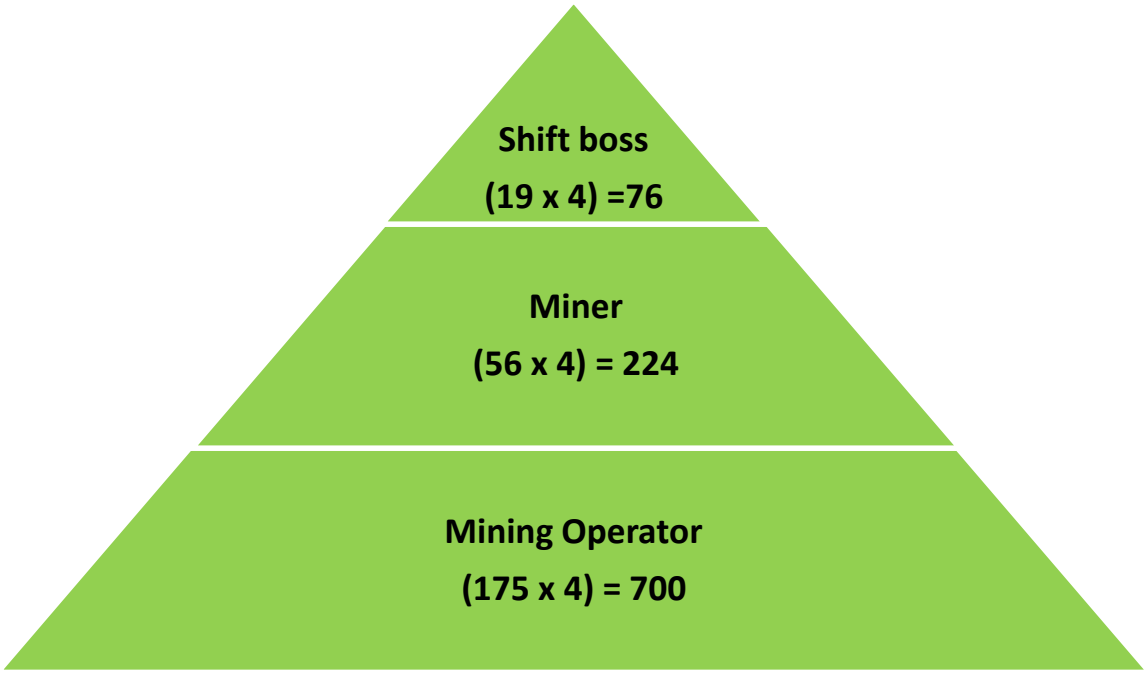
The research was in a cross-sectional format due to the time allocated for the project. Saunders and Lewis (2012) define cross-sectional research as the studying of a certain topic at a certain time. Data collection was in the form of distributing a 1 000 questionnaires to the four commodity mines of interest. A total response received was 723 out of the targeted 1 000. The questionnaire determined three aspects, the demography, the effectiveness of the communication and the employee engagement levels.

4.2.2 Population

Saunders and Lewis (2012) p.132 defined population as “The complete set of group members”. The research population was within the South African boundaries with four mining commodities thus suggesting a set. The study was aimed at the various mining houses that were affected by the recent economic downturn as per Business Monitor International (2013), that was coal, gold, iron ore and platinum. Data was gathered from the shift bosses, miners, mining operators and others. Other represented all the employees who are directly involved in the winning of the mineral that were not included in the mentioned three levels and as per Figure 18, an example of those would be the

artisans. The population was decided upon based on the fact that employee engagement matters on these levels the most since they are the ones directly involved in the mineral winning from the workings. Shift bosses, miners and mining operators are the ones on the coal face.

Figure 18 Targeted mining population



4.2.3 Unit of analysis

The study was aimed at shift bosses, miners, mining operators and other as per Figure 18. The targeted number was a 1 000 questionnaires with 250 from each commodity. The target for each level was 175 mining operators and other employees involved in mineral winning, 56 miners and 19 shift bosses per commodity as per Figure 18. This including the four commodities gave a total of a 1 000 employees.

The responses were coded into a quantity format on a Likert scale, the coding would allow for the use of the statistical analysis making use of IBM SPSS®. The questionnaires followed Saunders and Lewis (2012) ‘s in-depth method. Variables such as job grading and level of education were taken for analysis of mine’s labour force characteristics. Results were taken and analysed making use of the IBM SPSS ®.

4.2.4 Sampling method and size

Berenson, Levine, and Krehbiel, (2012) define a sample as the population portion chosen for analysis. Purposive sampling was used, Saunders and Lewis (2012) define it as non-probability sampling where the judgment of the researcher is used to select members to be sampled based on various reasons.

The main reason for purposive sampling was due to the fact that not all the mines will be chosen in South Africa but rather those who got affected by the mining economic downturn. The sample number was 250 for each of the selected commodities distributed as per Figure 18.

4.2.5 Measurement instrument

The research was quantitative and therefore the statistics software was used to assist in the production of the results based on the data collected from the mentioned mines. The software used is the IBM SPSS ®.

4.2.6 Data Collection process

The questionnaire in Appendix 1: Questionnaire was used as a tool for data collection. Saunders and Lewis (2012) suggested that this questionnaire should include all methods of collecting data whereby each respondent will be required to respond to the same questions. Saunders and Lewis (2012) state that the questionnaire is beneficial as it can be conducted on a face-to-face basis, telephonically or can be posted to intended respondents. The completed questionnaires were sent to the researcher via mail while others were physically handed over to the researcher.

The questionnaires were of a paper format distributed to the shift bosses, miners and mine operators. This was conducted through the Human resource department, the Training department to be specific. The researcher took the various training facilitators through the questionnaire who then continued to collect data from the mine employees, explaining and translating where necessary. The reason for this was to minimise the chances of misinterpretation during the data collection.

4.2.7 Data analysis

Quantitative data analysis refers to the process of breaking down collected data into constituent parts in order to obtain answers to hypotheses being tested. The manually collected data was captured in Microsoft Excel then exported to IBM Statistical Package for Social Science (SPSS) version 24. The data were coded, and the codebook is attached in Appendix 3: Codebook. The data was prepared by analysing for missing data to ensure that it was within 5% as proposed by Schafer (1999). From the original 736 responses, 13 were removed due to very high levels of incompleteness, resulting in a total of 723 responses for final data. The data was then analysed for extreme outlier using three times the Interquartile range, after which normality was evaluated using skewness and kurtosis considering ±2 as the normal or near normal range (Kline, 2011). The final data was found to be normal and thus parametric test was utilised during the analysis.

Descriptive statistics were analyses describe characteristics of a population or a sample, and for the individual variables (Terre Blanche Durrheim, 2002). The data was analysed for central tendency and spread. The central tendency was analysed using mean and median, while the spread was analysed using frequency, percentage frequency and standard (Saunders, Lewis & Thornhill, 2012). Inferential statistics which is the method used to draw conclusions about the population itself was conducted for the three sub-hypotheses. Before hypotheses testing the factor analysis and reliability were conducted using principal components analysis (PCA) using varimax rotation and Cronbach alpha coefficient, respectively.

The differences between the groups of the biographic variables were analysed using a t-test for two groups and ANOVA for three groups or more. The significance of the difference was tested at 95% confidence interval, with $p<.05$ indicating significance. For a relationship, Pearson correlation was used to understand the significance, direction and strength of the relationship, with the guidelines of Pallant (2010) followed for strength (no relationship: 0 – 0.09, small: 0.10 – 0.29, medium: 0.30 – 0.49, ≥ 0.50). For all significant relationship, linear regression analysis was performed to understand the amount explained by the relationship.

4.2.8 Reliability and Validity

Saunders and Lewis (2012) say validity's concern is whether the findings are really what they appear to be, they then define reliability as the extent to which the data collection and analysis methods produce consistent results over time.

The tests to be done will be through the ANOVA tests which will relate the results. The results will be reliable as the numbers will be from the mines and will not lie provided they are the true numbers. The researcher's report will be verified by a statistically conversant person listed in Appendix 2: Certification of data analysis support to ensure that the information has been entered correctly and that the results are being interpreted correctly.

Construct Validity and Reliability

The construct validity was conducted using PCA with varimax rotation. Construct validity was conducted for effective communication and employee engagement. The data could be subjected to factor analysis as there was sufficient observation for a minimum of five observations per variable as this study had 723 responses.

Effective communication

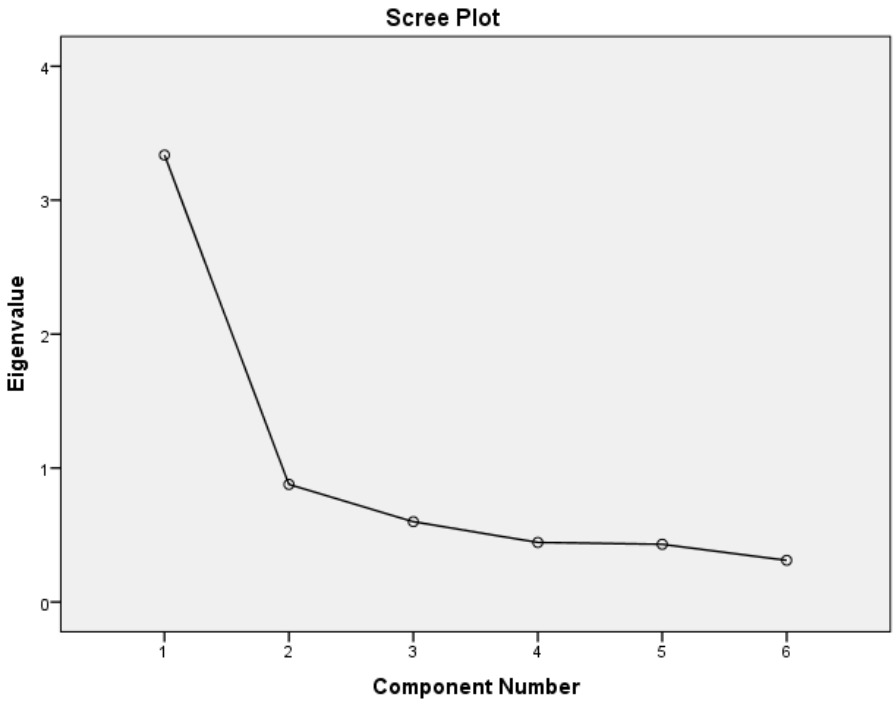
The Kaiser-Meyer-Olkin (KMO) test was 0.838 and Bartlett's test for sphericity was significant with a p-value of <0.005, thus confirming the suitability of factor analysis as indicated in **Table** 3 **KMO and Bartlett's test for effective communication** (Hair et *al*, 2006).

Table 3 KMO and Bartlett's test for effective communication

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.838
Bartlett's Test of Sphericity	Approx. Chi-Square	1500.039
	df	15
	Sig.	.000

The analysis extracted two factors from six variables based on total variance 70.2% and scree plot with an inflection point on third factor meaning two factors can be retained as displayed by Figure 19. The scree plot method of extraction was based on the recommendations by Costello and Osborne (2005) over the Eingen method.

Figure 19 Scree plot of effective communication construct dimensions



The rotated component shows that factor 1 comprised of three items EC1, EC2 and EC 3 as per **Table** 4 with the loading of 0.646 - 0.880 and this factor was named EFFCom 1, while factor 2 also had three items with the loading of 0.794 – 0.848 and named EFFCom 2.

Table 4 Rotated component matrix for effective communication

Rotated Component Matrix[a]

	Component	
	1	2
EC5	.848	.229
EC6	.814	.218
EC4	.794	.222
EC2	.063	.880
EC3	.393	.675
EC1	.497	.646

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

These factors were subjected to reliability analysis and both dimensions were found to be reliable with 0.728 for EFFCom 1 and 0.819 for EFFCom 2 based on guidelines of George and Mallery (2003). After which, a Confirmatory factor analysis (CFA) was conducted on the hypothesized model using SPSS AMOS version 24. The was good model fit based on the guidelines of Byrne (2010) with cmin / df (1 – 5), CFI and TLI (> 0.85) and RMSEA (<0.080).

Employee engagement

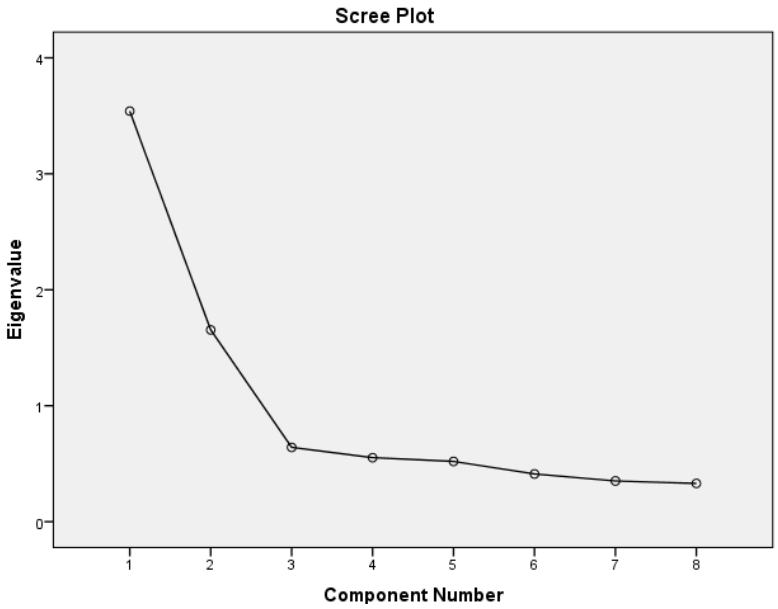
The Kaiser-Meyer-Olkin (KMO) test was 0.821 and Bartlett's test for sphericity was significant with a p-value of <0.005, thus confirming the suitability of factor analysis as indicated in **Table** 5 (Hair, Babin, Anderson & Tatham, 2010)

Table 5 KMO and Bartlett's test for sphericity for employee engagement

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.821
Bartlett's Test of Sphericity	Approx. Chi-Square	2046.185
	df	28
	Sig.	.000

The analysis extracted two factors from eight with a total variance 64.92% and scree plot with an inflection point on third factor meaning two factors can be retained by Figure 20.

Figure 20 Scree plot of effective communication construct dimensions



The rotated component shows that factor 1 comprised of three items (EE1, EE2 and EE 3) with the the loading of 0.763 - 0.872 and this factor was named EEng 1, while factor 2 also had items with the loading of 0.669 – 0.830 and named EEng 2 as per **Table** 6. Both these factors were found to be reliable, with a Cronbach alpha of 0.780 for EEng 1 and 0.837 for EEng 2.

Table 6 Rotated component matrix for effective communication

Rotated Component Matrix[a]

	Component	
	1	2
EE5	.830	.138
EE7	.820	.057
EE6	.782	.047
EE4	.742	.196
EE8	.669	.212
EE2	.121	.872
EE3	.042	.830
EE1	.261	.763

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

4.3 Limitations of the research

The research was done in snapshot format, with only the cross-sectional information being in place, which was from July 2017 until September 2017. This, therefore, means that one cannot develop the trend in the effective communication and employee engagement.

The study was planned to have an equal number of representatives per commodity with a thousand participants being 250 per commodity. This did not happen that way, therefore, leaving other commodities relatively under or over-represented.

4.4 Consistency Matrix

Title: Effective communication as a tool to increase labour engagement during uncertain times in the mining sector

Hypothesis	**Literature Review**	**Data Collection Tool**	**Analysis**
Research hypothesis 1: *H_{01}: There is no effective communication at the mines in South Africa.* *H_{11}: There is an effective communication at the mines in South Africa.*	(Falkheimer, 2014; Frank Cervone, 2014; Per Nilsson and Pettersson, 2013; Togna, 2014)	Questionnaire as per Appendix 1: Questionnaire, Question 2 discussing effective communication.	Questions covering effective communication making use of two elements, "Quality and reliability of the information received" and "Communication climate"

Research hypothesis 2: *H_{01}: There is no employee engagement in the mines in South Africa.* *H_{11}: There is employee engagement in the mines in South Africa.*	(Gallup, 2013, 2016; Kumar, Arasu, and Nagarajan, 2013; Rana, Ardichvili, and Tkachenko, 2014; Sahoo and Mishra, 2012; Saks and Gruman, 2014; Swarnalatha and Prasanna, 2013; Towers Watson, 2013)	Questionnaire as per Appendix 1: Questionnaire, Question 3 discussing employee engagement.	Questions covering the employee engagement making use of two elements, "Workplace environment" and "Individual characteristics"
Research hypothesis 3: *H_{01}: Effective communication at the mines has a positive influence over the employees' engagement.* *H_{11}: Communication at the mines has no influence over the employees' engagement.*	(Kumar et al., 2013; Mbhele, 2016; Sahoo and Mishra, 2012; Taneja, Sewell, and Odom, 2015)	Questionnaire as per Appendix 1: Questionnaire, Question 2 and Question 3 discussing Effective communication and Employee engagement	Establishes the relationship between Effective communication and employee engagement

4.5 Questionnaire design

The questionnaire is as per attachment in Appendix 1: Questionnaire. The questionnaire had three parts to it, the demographic questions, effective communication and the employee engagement part. It was changed post piloting, the respondents were not comfortable responding to some questions while others complained about the length of the questionnaire, it was taking them too long to complete. The revised questionnaire still covers all the key elements to ensure it captures the necessary information to execute this study. The design of it is discussed in the section below.

4.5.1 Demographic information

This part was included to see if certain demographical elements affected both the effective communication and employee engagement.

4.5.2 Communication

The communication part was adopted from Mbhele (2016) ‘s research where two of the components covered the “Communication climate” while the other covered the “Quality and reliability of information received”. Mbhele (2016) had adapted this from Dennis’s communication climate survey, 1979; Grunig, Grunig and Dozier, 2002 and Management practices survey by Kim and Yukl, 1996)

Mbhele (2016) stated that the communication climate is identified mostly by the relationship between the employees and the supervisors and/or management. It can be identified by statements like “My supervisor makes me feel free in talking to them”.

4.5.3 Engagement

The engagement part was adopted from Hlapho (2015)’s thesis and Rana, Ardichvili and Tkachenko (2014) ‘s journal paper on employee engagement antecedents. The elements relevant to this study were found to be the “Workplace environment” and the “Individual characteristics”. Rana, Ardichvili and Tkachenko (2014) explain the need for a harmonious and meaningful environment of work which has necessary tangible resources, supportive workplace and a perceived level of safety in having a positive employee engagement.

The individual‘s characteristics attribute to positive employee engagement based on them proactive, optimistic, conscience and having a sense of self-efficacy (Rana, Ardichvili and Tkachenko, 2014).

CHAPTER 5 FINDINGS OF THE STUDY

The aim of this study is to determine the influence of effective communication on employee engagement in the mining industry. A conceptual model and hypotheses were developed in chapter 3, and the method applied to test them was discussed in chapter 4. In this chapter, the findings are presented. Data from 723 participants were used in this study. The chapter highlights the biographic profile of the participants. The results for the construct validity and reliability are presented, followed by testing of hypothesis one and its sub-hypotheses for the level of effective communication and the differences between the different biographic groups. The same approach is adopted for employee engagement Hypothesis two after which, the influence of effective communication on employed engagement was tested in Hypothesis three. For all the three hypotheses, a decision is made whether the null or alternative hypothesis is accepted to confirm or reject the theory.

5.1 Biographic profile

There are five questions that profiled the respondents in this study. Two were personal characteristics asking of the highest level of education and whether the participant was the only breadwinner. The other three were employment characteristics asking of the job description category, mineral resource mined by the participants and their awareness of mining industry‘s economic instabilities. Both the profile of the personal characteristics and the employment characteristics are presented in Table 7 In terms of education, the highest number of participants were matric graduates which comprised of 45.6% (n=319) of the total participants, followed by those who indicated that they had partially completed high school as their highest education level with 26.4% (n=185). 13.0% (n=91) of those participants indicated a mining certificate as their highest education level and 10.6% (n=74) indicated a diploma as their highest education level. Four in every five participants indicated that they were only breadwinners with 80.0% (n=572), while the other third (20.0%) were not the only breadwinners. Almost half of the participants were mining operators comprising of 46.7% (n=335). This was the largest single group of participants. They are followed by miner and other with 10.4% (n=75) and 34.0% (n = 244), respectively. Of these employees, 33.3% (n =241) were in the platinum mineral resource, while 28.9% (n = 209) were in the coal mineral resources. There was about 21.9% (n=158) of employees that were involved in the iron ore mineral resource, while 15.9% (n = 115) of the respondents had been in the gold mineral resource. The last variable of the

employment characteristics of the respondents was awareness of mining industry economic instability where many respondents indicated that they were aware with 80.0% (n=572) and 20.0% (n=143) of the participant were not aware.

Table 7 Biographic profile of the participants

		Frequency (*n*)	Percentage frequency (%)
Job Description	Shift boss	64	8.9
	Miner	75	10.4
	Mining operator	335	46.7
	Other	244	34
	Total	718	100
Highest education level	Partially completed high school	185	26.4
	Mining certificate	91	13
	Matric graduate	319	45.6
	Diploma	74	10.6
	Degree	31	4.4
	Total	700	100
Mineral resource mined	Coal	209	28.9
	Gold	115	15.9
	Iron ore	158	21.9
	Platinum	241	33.3
	Total	723	100
Awareness of mining industry economic instability	No	175	24.5
	Yes	540	75.5
	Total	715	100
Only breadwinner	No	143	20
	Yes	572	80
	Total	**715**	**100**

5. 2 Effective communication

The study investigated effective communication with the following hypothesis:

H_{01}: There is no effective communication at the mines in South Africa

H_{11}: There is an effective communication at the mines in South Africa

5.2.1 Descriptive statistics

Six variables were utilised to understand the effective communication (EC) within the mining sector employees. Three of these represented quality and reliability of the information being received, that is EC1, EC2 and EC3. The other three represent the communication climate that is EC4, EC5 and EC6. Table 8 presents the descriptive statistics results of these variables. The effective communication presents the overall median of variables to be four; the mean variables did not have much difference between them with a range of mean ranging at 3.34 to 3.79. The highest mean is shown to be 3.79 (SD=1.058) followed by mean=3.67 (SD=1.055) "*You expect that recommendations you make will be heard and seriously considered*", EC5 and EC6 had the same mean variables, mean=3.63. The lowest variable was mean= 3.34 (SD=1.123) "You are satisfied with the explanations you get from top management about why things are done as they are", followed by mean=3.52 (SD=1.152) "*Your feel free to challenge your superior when you disagree with them*".

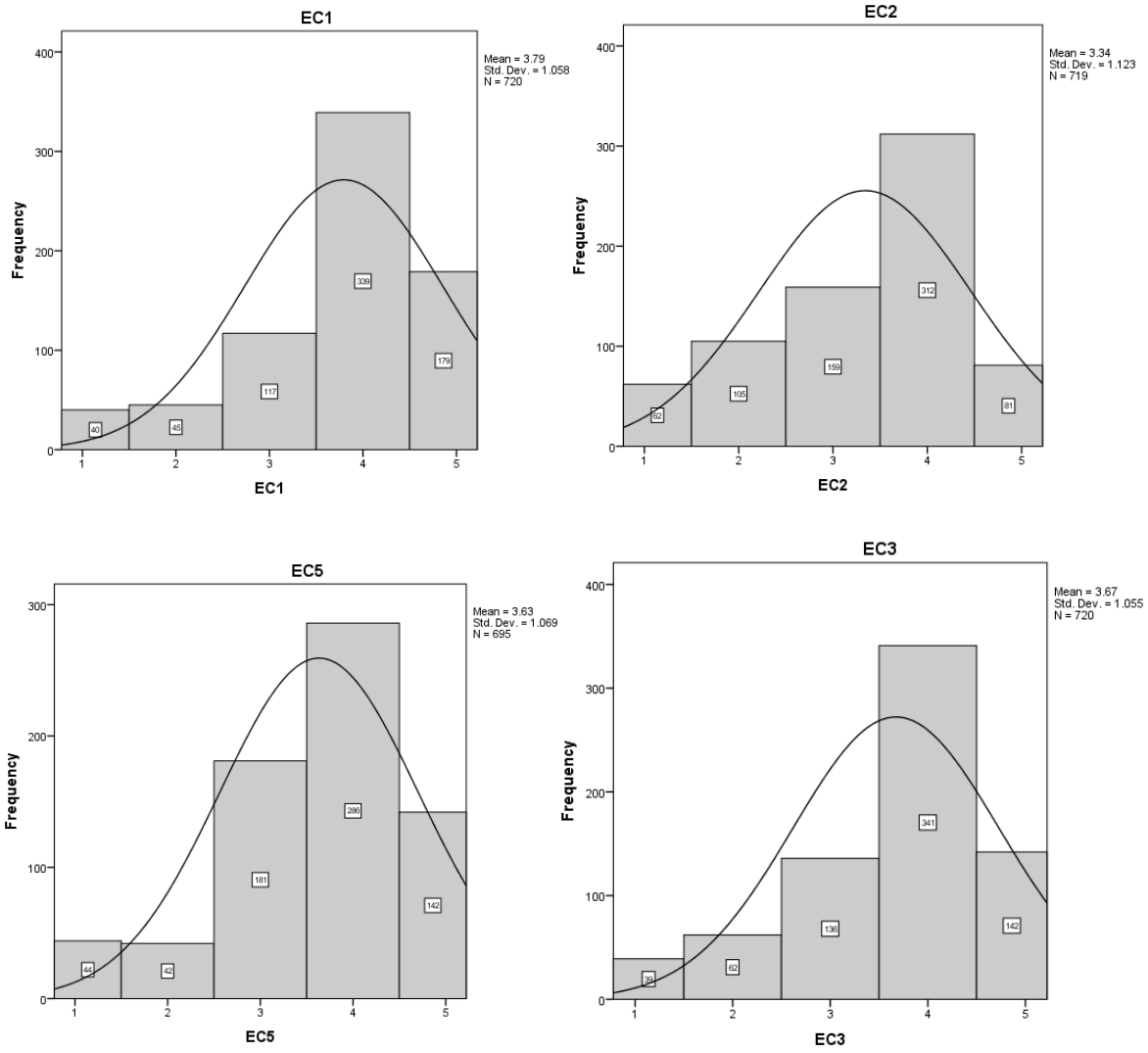
Table 8 Descriptive statistics of effective communication

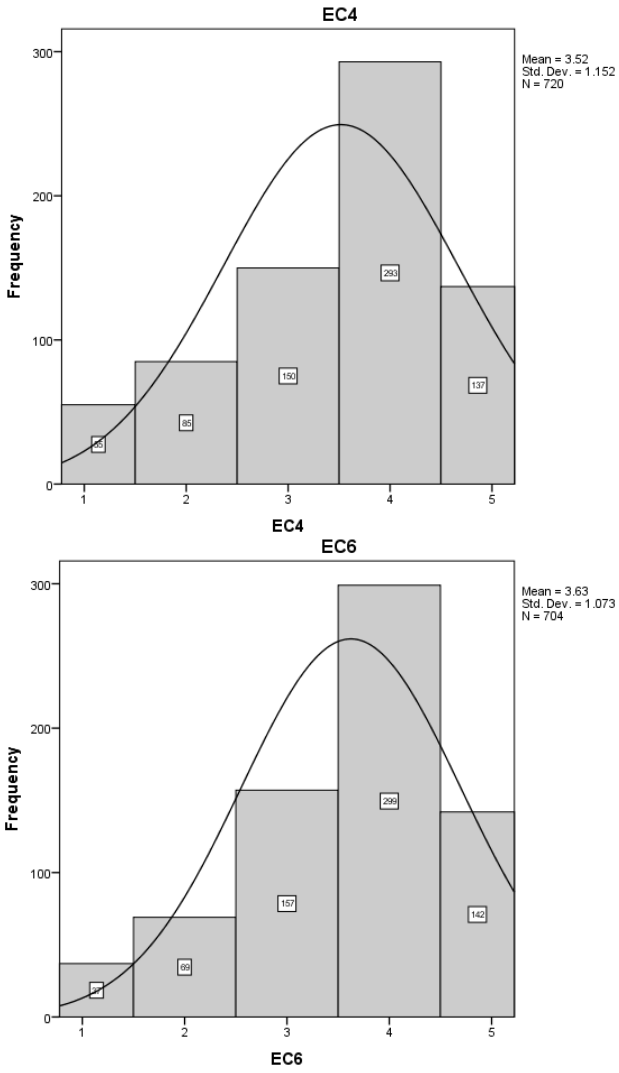
Variables		N Valid	Mean	Median	Std. Deviation	Skewness	Kurtosis
Your superior(s) provide you with the type of information you really want and need.	EC1	720	3.79	4.00	1.058	-1.029	0.709
You are satisfied with the explanations you get from top management about why things are done as they are.	EC2	719	3.34	4.00	1.123	-0.587	-0.473
You expect that recommendations you make will be heard and seriously considered.	EC3	720	3.67	4.00	1.055	-0.872	0.328
Your feel free to challenge your superior when you disagree with them.	EC4	720	3.52	4.00	1.152	-0.651	-0.346
Your superior listens to you when you tell him/her about things that are bothering you?	EC5	695	3.63	4.00	1.069	-0.775	0.260
You feel safe and protected when you tell you superior about things that have not gone well at work?	EC6	704	3.63	4.00	1.073	-0.715	-0.006

Std error of skewness = 0.091; Std error of kurtosis =0.182

The skewness was ranging from -0.651 to -1.029 with standard error for skewness of 0.091, while kurtosis ranges from -0.006 to 0.328, the kurtosis had a standard error of 0.183. This indicated a normal distribution and within the range of ± 2 recommended by Kline (2011) for normal distribution as per *Figure 21*. In all six statements that made up the effective communication of the employees the dominant selection was 4 “Agree”. This means the employees had by a large number agreed with all the statements posed to them in this study as represented in graphs in Figure 21.

Figure 21 Histogram with normal distribution for effective communication variables





The employees overall view is that there is an effective communication in their working area. These statements are as follows with their means and standard deviations.

- “Your superior(s) provide you with the type of information you really want and need (EC1)”. had a mean= 3.79 (SD=1.058)
- “You are satisfied with the explanations you get from top management about why things are done as they are (EC2).” had a mean= 3.34 (SD=1.123)
- “You expect that recommendations you make will be heard and seriously considered” (EC3).’ had a mean= 3.67 (SD=1.055)
- ‘Your feel free to challenge your superior when you disagree with them (EC4).’ had a mean= 3.52 (SD=1.152)

- 'Your superior listens to you when you tell him/her about things that are bothering you (EC5).' had a mean= 3.63 (SD=1.069)
- 'You feel safe and protected when you tell you superior about things that have not gone well at work (EC6).' had a mean= 3.63 (SD=1.073).

5.2.2 Construct validity and reliability

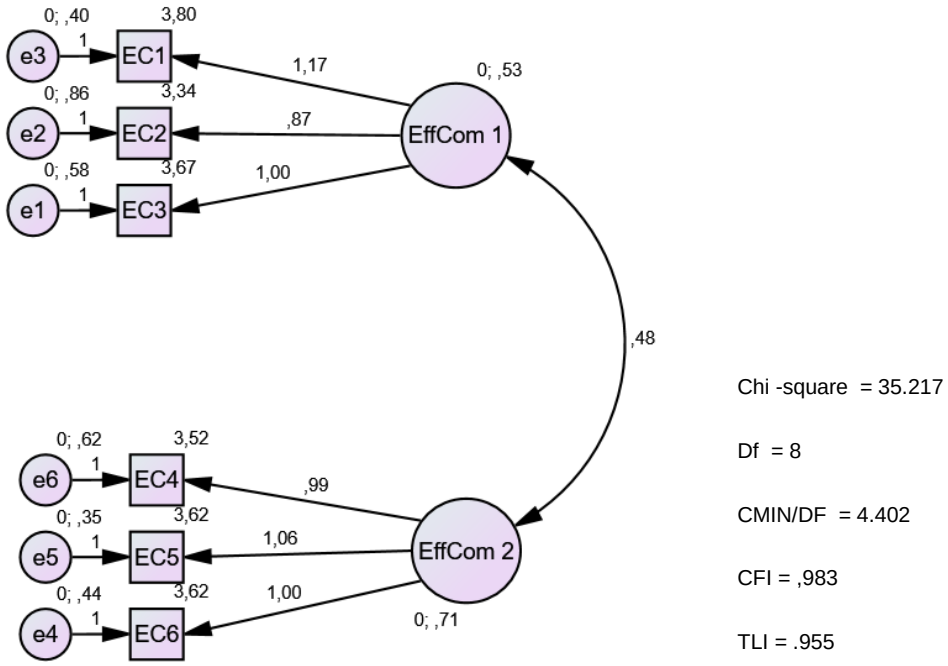
As discussed in chapter 4, two dimensions were extracted with a total variance of 70.2%. Factor one effective communication 1 (EFFCom1) had the highest percentage variance of 55.6% followed by factor 2 (EFFCom2) with the percentage (%) variance of 14.6% and with their factor loading all above 0.4. All these three factors were subjected to internal reliability consistency using Cronbach Alpha coefficient were confirmed as reliable based on the guidelines of George and Mallery (2003) with the results presented in Table 9

Table 9 Dimensions of Effective communication factors

Factors	No of items	Factor loading	% Variance	Cronbach alpha (α)
EFFCom 1	3	0.49-0.848	55.615	0.728
EFFCom 2	3	0.646-0.880	14.627	0.819

The confirmatory factor analysis was adopted to validate the hypothesized measurement model of effective communication (EFFCom), which incorporates two factors, EFFCom 1 and EFFCom 2 in Figure 22. EFFCom 1 represents the quality and reliability of the information shared while EFFCom 2 represents the communication climate. In this study, the initial confirmatory factor analysis was estimated with six items; each item was assumed to load only on its respective dimension. The results indicated that the parameters were free from offending estimates. The overall goodness-of-fit of the model was adequate, the cmin/*df* = 4.402 (Guidelines 1- 5); RMSEA = 0.069 (Guideline <0.080; CFI = 0.983 (Guideline > 0.85); TLI = 0.955 (Guideline >0.85). Based on the guidelines of Byrne (2010) and Hair, Babin, Anderson and Tatham (2010). Overall, it can be confirmed that effective communication construct has two dimensions, which are EFFCom 1 and EFFCom 2.

Figure 22 Hypothesised measurement model for effective communication



5. 2.3 Level of effective communication

To test the level of effective communication, a one-sample t-test was used. In this study, the questionnaire number '3' was neither disagree nor agree, so the test is whether the outcome of the participant departs significantly from neutral to either disagree (meaning a low level of effective communication) or agree (high effective communication). The level of effective communication in this study was investigated with the following hypothesis:

H_{01a}: There is no effective communication at the mines in South Africa

H_{11a}: There is effective communication at the mines in South Africa

One sample t-test in Table 10 shows that the mean for both EFFCom 1 and EFFCom 2 was conducted for both the dimensions of effective communication as shown in Table 10. The mean score for EFFCom 1 was 3.60 (SD =0.869) meaning it was higher than the neutral value of '3'. The same was found for EFFCom 2 with a mean score of 3.61 (SD= 0.938). The test shows that there was a statistical significance, with t (714) =18.576, p<.05 and t (673) = 16.828, p<.05 for EFFCom 1 and EFFCom 2, respectively.

Table 10 One sample t-test for effective communication

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
EFFCom1	18.579	714	.000	.60373	.5399	.6675
EFFCom 2	16.828	673	.000	.60781	.5369	.6787

EFFCom 1: n = 715 Mean = 3.60 (SD = 0.869); EFFCom 2: n = 674 Mean = 3.61 (SD =0.938)

It can thus be concluded that the null hypothesis is rejected and the alternative hypothesis (H_{11a}) which stated that there is an effective communication at the mines in South Africa is accepted.

5. 2.4 Differences between biographic groups on effective communication

Hypothesis 1b was stated as follows:

H_{01b}: There are no differences among the biographic groups on effective communication

H_{01b}: There are differences among the biographic groups on effective communication

Hypothesis 1b was tested using an independent t-test for variables with two groups and Analysis of variance (ANOVA) for variables with three groups and more as per Table 11. A t-test for awareness of mining instability revealed that there were significant differences between the biographic groups on effective communication (EFFCom1) with t (705) =-3.970. *p*=0.000. For EFFCom1 the mean value for those answered “Yes” that they are aware of the mining instability was bigger (mean= 3.68, SD=0.807) than those who answered No (mean= 3.38, SD=1.003). Those that indicated that they were aware of mining instability rated effective communication (EFFCom 1) higher than those who were not aware.

Table 11 Independent sample t-test for biographic groups on effective communication

		t-test for Equality of Means

		t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Awareness of mining instability	EFFCom1	-3,970	705	0,000	-0,29880	0,07526	-0,44656	-0,15103
	EFFCom 2	-1,525	664	0,128	-0,12828	0,08410	-0,29342	0,03686
Breadwinner	EFFCom1	0,421	705	0,674	0,03461	0,08216	-0,12669	0,19592
	EFFCom 2	-0,488	665	0,625	-0,04433	0,09076	-0,22254	0,13388

EFFCom 1: No - n = 172 Mean = 3,38 (SD = 1,003) Yes - n =535 Mean = 3,68 (SD = 0,807)

Table 12 present the ANOVA results for the biographic groups on effective communication for the job description, education and mineral mined variables.

Table 12 ANOVA for biographic groups on effective communication

			Sum of Squares	df	Mean Square	F	Sig.
Job description	EFFCom1	Between Groups	3,858	3	1,286	1,707	0,164
		Within Groups	532,769	707	0,754		
		Total	536,627	710			
	EFFCom 2	Between Groups	2,142	3	0,714	0,810	0,489
		Within Groups	587,016	666	0,881		
		Total	589,158	669			
Education level	EFFCom1	Between Groups	9,470	4	2,368	3,178	0,013
		Within Groups	511,827	687	0,745		
		Total	521,297	691			
	EFFCom 2	Between Groups	14,704	4	3,676	4,259	0,002
		Within Groups	559,286	648	0,863		
		Total	573,990	652			
Mineral mined	EFFCom1	Between Groups	11,210	3	3,737	5,033	0,002
		Within Groups	527,847	711	0,742		
		Total	539,057	714			
	EFFCom 2	Between Groups	52,027	3	17,342	21,527	0,000
		Within Groups	539,750	670	0,806		
		Total	591,777	673			

Education level and mineral mined were found to have a significant difference on effective communication, thus rejecting the null and retaining the alternative null hypothesis that there is a significant difference among the biographic groups on effective communication.

For those that were significant, a post hoc test using Bonferroni was employed to understand the pairs that were significant among the groups as per *Table 13*.

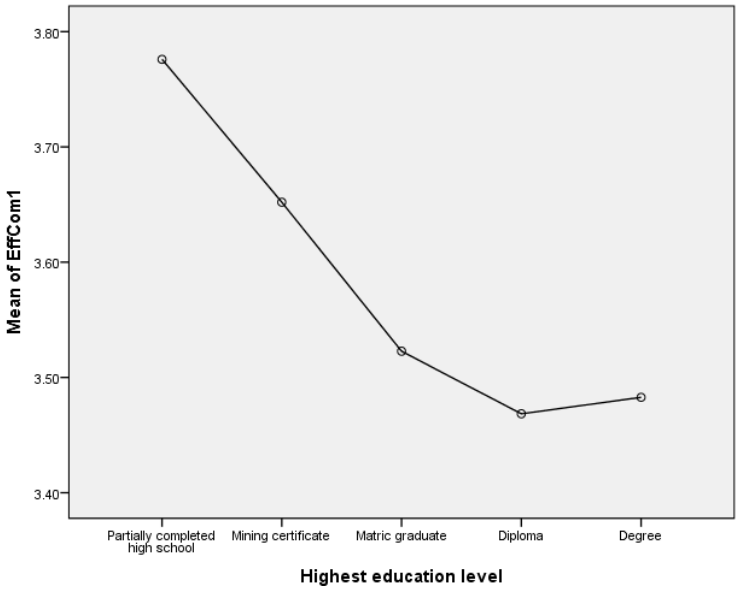
Table 13 Post hoc test (Multiple comparisons) for effective communication and education level

Dependent Variable	(I) Highest education level	(J) Highest education level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
EFFCom1	Partially completed high school	Matric graduate	.25320*	0.08023	0.017	0.0273	0.4791
EFFCom2	Partially completed high school	Matric graduate	.30170*	0.0897	0.008	0.0491	0.5543
	Partially completed high school	Diploma	.47551*	0.13228	0.003	0.1029	0.8481

**. The mean difference is significant at the 0.05 level.*

Within this pair, the significant difference was evident between partially completed high school and matric graduate with a mean difference of 0.25320 with F (4, 687) =3.178, *p*=0.013 with partial completed high school had higher mean as visualised in means plot for EFFCom1 as indicated by Figure 23.

Figure 23 Mean plot of education level with EFFCom 1



There was also a difference between partially completed high school and matric graduate with a mean difference of 0.30170 also between partially completed high school and diploma with a mean difference of 0.47551 with F (4,648) =4.259, *p*=0.002. Again, partially completed high school participants had higher scores than both the matric graduates and diploma as shown by Figure 24.

Figure 24 Mean plot of highest education level with EFFCom 2

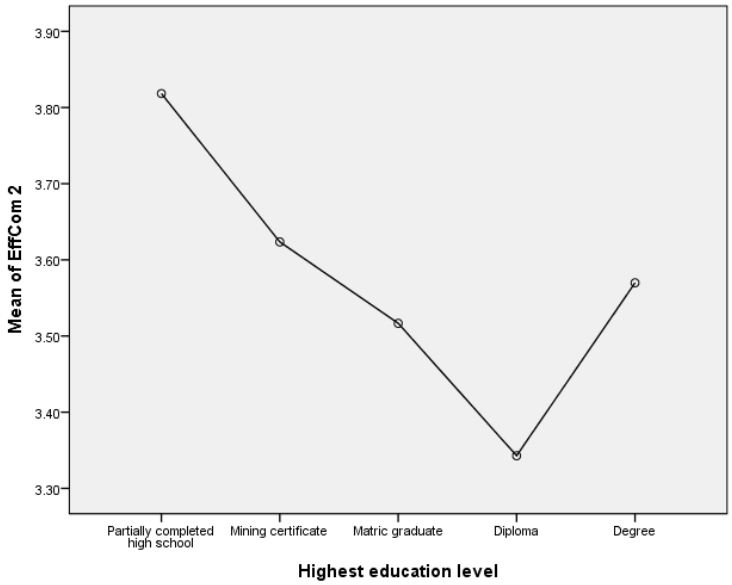


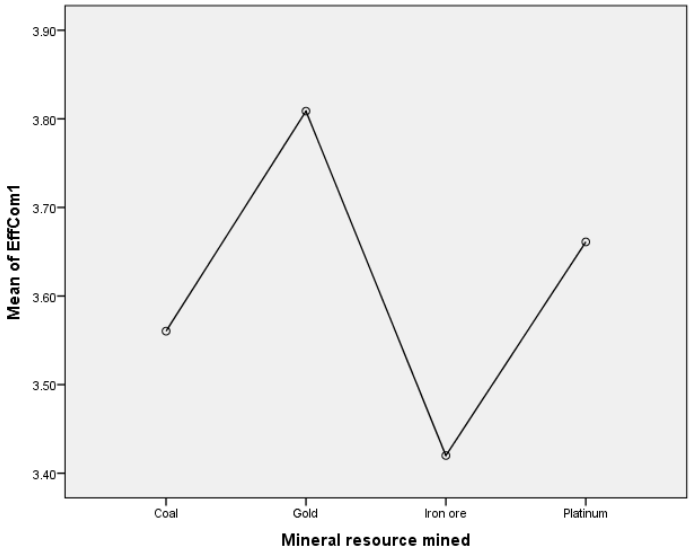
Table 14 presents a post hoc test using Bonferroni of effective communication on minerals mined.

Table 14 Post hoc test (Multiple comparison) for effective communication and minerals mined

Dependent Variable	(I) Mineral resource mined	(J) Mineral resource mined	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
EFFCom 1	Gold	Iron ore	.38878*	.10619	.002	.1078	.6697
	Iron ore	Platinum	-.24117*	.08903	.041	-.4767	-.0056
EFFCom 2	Coal	Gold	-.72793*	.10912	.000	-1.0167	-.4392
	Gold	Iron ore	.75484*	.11298	.000	.4559	1.0538
	Gold	Platinum	.79065*	.10574	.000	.5109	1.0704
*. The mean difference is significant at the 0.05 level.							

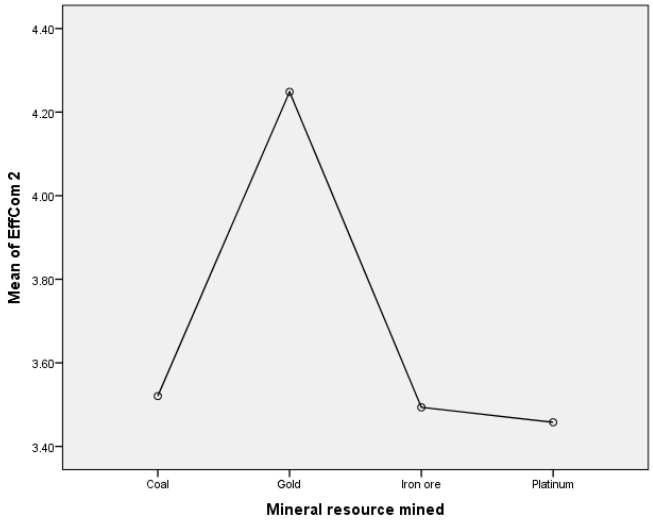
For EFFCom 1, within this pair, the significant difference was evident between gold and iron ore a mean difference of 0.38878 and between iron ore and platinum, a mean difference of -0.24117, F (3,711) =5.033, *p*=0.002. Figure 25 shows a mean plot which clearly shows that gold had a higher mean than iron, and platinum had a higher mean than iron ore.

Figure 25 Mean plot of minerals mined with EFFCom 1



There was also an evident significant difference between coal and gold with a mean difference -0.72793; between gold and iron ore with a mean difference 0.75484 and between gold and platinum with a mean difference of 0.79065 with F (3,670) =, *p*=0.000. Across all this mineral mined gold had the highest mean in comparison to platinum, iron ore and coal as represented by Figure 26.

Figure 26 Mean plot of minerals mined with EFFCom 2



In can be concluded that there were some significant differences among the education level, a mineral mined and awareness about the instability in the mining industry and no significance for job description and status of breadwinner. This means that that the null is accepted for job description and status of breadwinner and the alternative hypothesis is accepted for education level, a mineral mined and awareness of mining industry instability.

5.3 Employee engagement

Hypothesis two was stated as follows:

H_{01}: There is no employee engagement in the mines in South Africa

H_{11}: There is employee engagement in the mines in South Africa

5.3.1 Descriptive statistics

Eight variables were utilised to understand the employee engagement within the mining sector employees. Table 15 presents the descriptive statistics results of these variables.

Table 15 Descriptive statistics of employee engagement

Variable		N		Median	Std. Deviation
		Valid	Mean		
You get excited about going to work?	EE1	712	3.70	4.00	1.086
Would you recommend your organisation, as a good place to work in?	EE2	714	3.59	4.00	1.068
Looking back over the past year or so, your organisation has become a better place to work in?	EE3	711	3.44	4.00	1.081
I am willing to take on new tasks as required by my manager.	EE4	708	4.17	4.00	0.769
Do you take the initiative to help your colleagues with their work, when the need arises?	EE5	713	4.26	4.00	0.761
Does your team help you to complete your work?	EE6	712	4.09	4.00	0.825
Do you suggest solutions to problems that arise in your team or workspace?	EE7	714	4.15	4.00	0.785
When you receive feedback on your performance, are you able to respond positively?	EE8	715	4.08	4.00	0.858

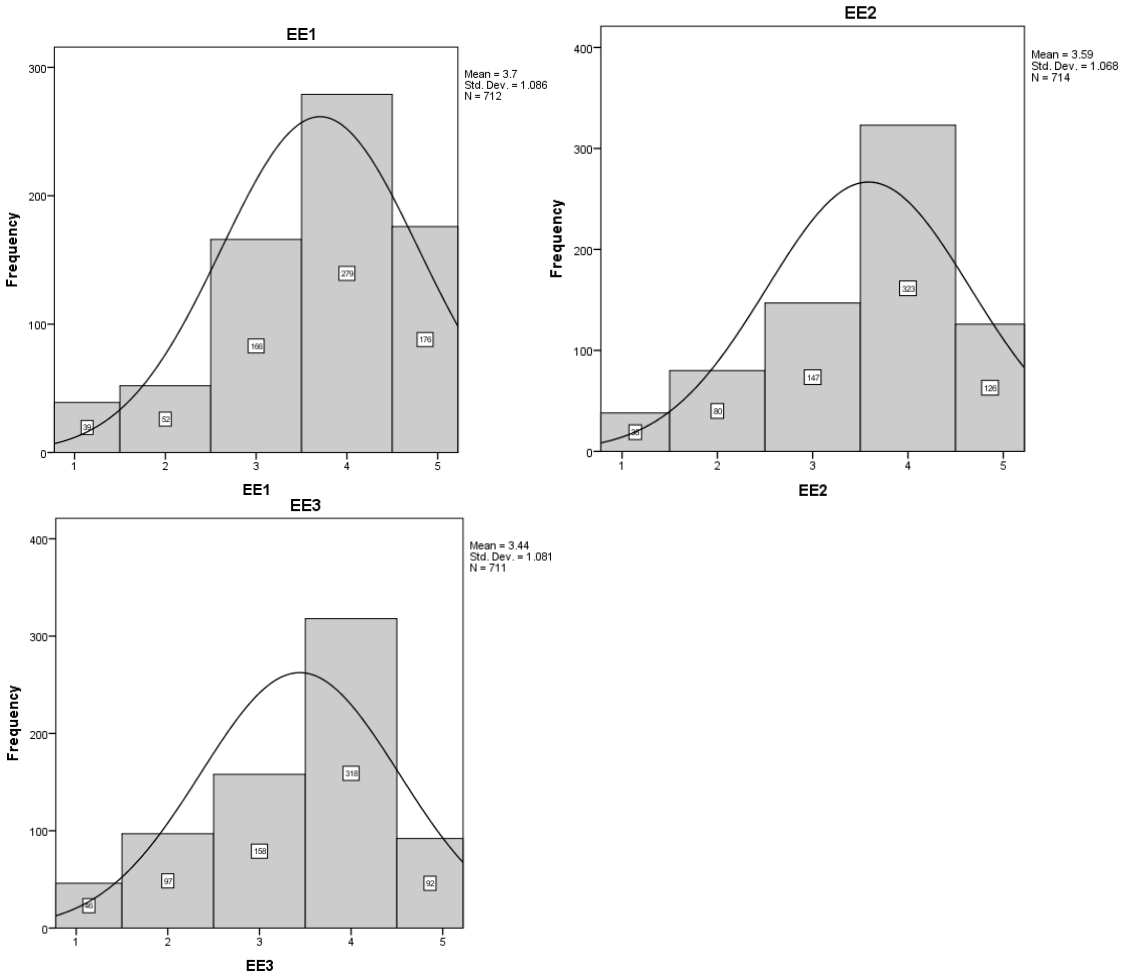
The overall median value of these variables was 4, the highest mean of 4.26 (SD=0.761) for the statement “Do you take the initiative to help your colleagues with their work, when the need arises?” followed by statement, “I am willing to take on new tasks as required by my manager.” Mean = 4.17 (SD=0.769), “Do you suggest solutions to problems that arise in your team or workspace?” mean =4.15 (SD=0.785). The lowest mean was 3.44 (SD=1.081) “Looking back over the past year or so, your organisation has become a better place to work in?” followed by mean = 3.59 (SD=1.068) with a statement “Would you recommend your organisation, as a good place to work in?” There were eight statements

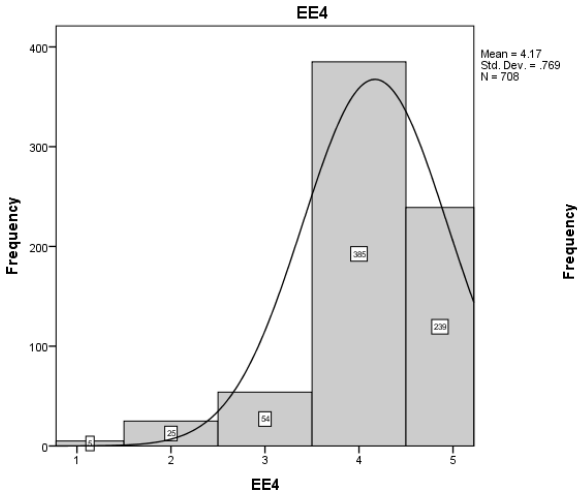
that were utilised for the employee engagement section of the questionnaire. The employee had best agreed with all the statements and they're very few who had disagreed with these statements. Figure 27 represents engagement in this regard as being positive with the highest peak at 4 (agree).

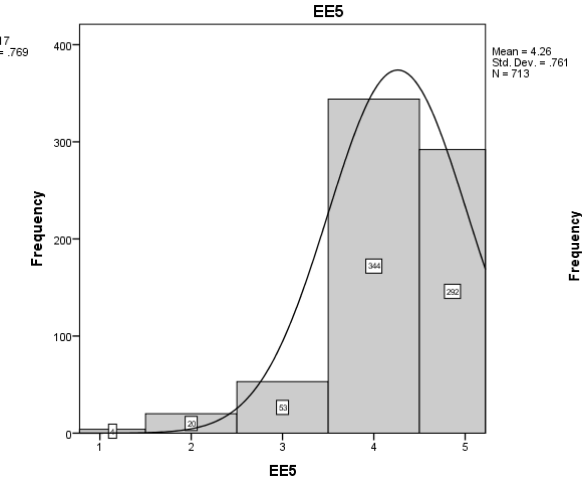
These statements are as follows with their mean values and standard deviations.

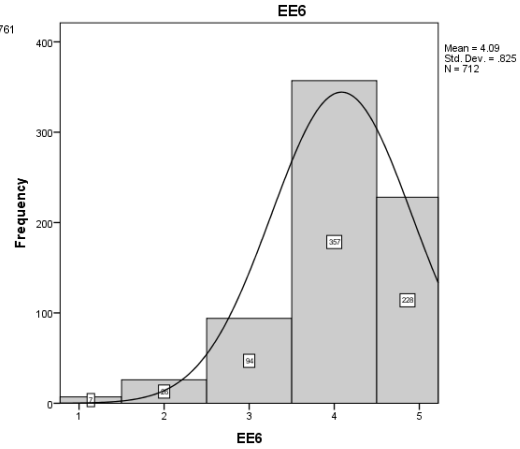
- 'You get excited about going to work (EE1)' had mean of 3.7 (SD=1.086)
- 'Would you recommend your organisation, as a good place to work in? (EE2)' had mean of 3.59 (SD=1.068)
- Looking back over the past year or so, your organisation has become a better place to work in? (EE3)' had a mean of 3.44 (SD=1.081)
- 'I am willing to take on new tasks as required by my manager (EE4)' had a mean of 4.17 (SD=0.769)
- 'Do you take the initiative to help your colleagues with their work, when the need arises? (EE5)' had a mean of 4.26 (SD=0.761)
- 'Does your team help you to complete your work? (EE6)' had a mean of 4.09 (SD=0.825)
- 'Do you suggest solutions to problems that arise in your team or workspace? (EE7)' had a mean of 4.15 (SD=0.785)
- 'When you receive feedback on your performance, are you able to respond positively? (EE8)' had a mean of 4.08 (SD=0.858)

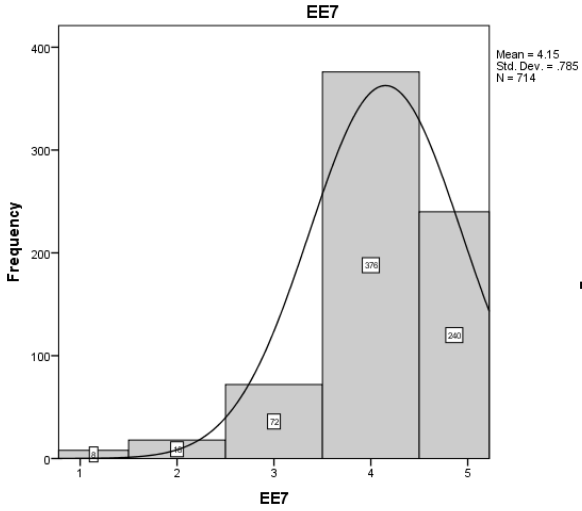
Figure 27 Histogram with normal distribution for employee engagement

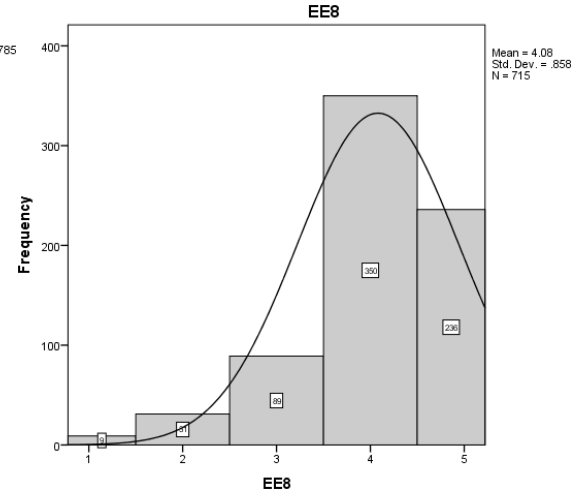












5.3.2 Construct validity and reliability

From the eight variables, two factors were extracted with a total % variance of 64.9% as discussed in chapter 4 and were found reliable. Factor 1 Employee Engagement (EEng), (EEng1) had the highest percentage (%) variance of 44.2% and Factor 2 (EEng2) had a percentage variance of 20.7% and their Eigen values 3.540 and 1.654. These two factors were subjected to internal reliability consistency using Cronbach Alpha coefficient and were confirmed as reliable as represented in Table 16.

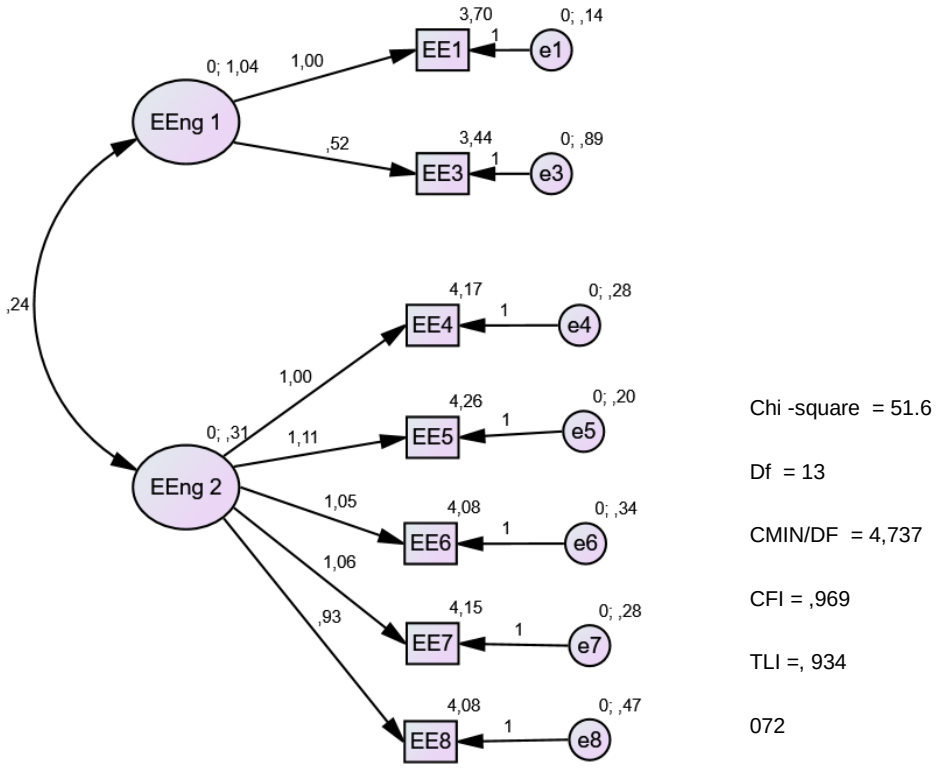
Table 16 Dimensions of Employee engagement factors

Factors	No of items	Factor loading	% Variance	Eigen values	Cronbach alpha (α)
EEng 1	5	0.669-0.830	44.252	3.540	0.819
EEng2	3	0.763-0.872	20.672	1.654	0.728

The confirmatory factor analysis was adopted to validate the hypothesized measurement model of employee engagement, which includes two factors, namely Effective communication 1 (Eff1) and Effective communication 2 (Eff2) as represented in

Figure *28*.

Figure 28 Hypothesised measurement model for effective communication



The initial confirmatory factor analysis was estimated with eight items; each item was assumed to load only on its respective dimension. The initial model had a cmin/*df* =5,490 and RMSEA = .079. Analysis was done resulting in the exclusion of variable EE2, and the final refined model had seven items. The overall goodness of fit for the refined model was good, the cmin/*df* = 4.737 (Guidelines 1- 5); RMSEA = 0.072

(Guideline <0.080; CFI = 0.969 (Guideline > 0.85); TLI = 0.934 (Guideline >0.85). Overall, it can be confirmed that employee engagement construct has two dimensions, which are Employee Engagement 1 (EEng1) and Employee Engagement (EEng 2).

EEng 1 represents the workplace environment with regards to its impact on employee engagement. EEng 2 represents individual characteristics in terms of being proactive, optimistic and conscience which determines the level of engagement.

5.3.3 Level of employee engagement

The level of employee engagement in this study was investigated with the following hypothesis:

H_{01a}: There is no employee engagement at the mines in South Africa

H_{11a}: There is employee engagement at the mines in South Africa

One sample t-test shows that the mean for both Employee engagement 1 (EEng1) and Employee Engagement 2 (EEng2) was conducted for the dimensions of employee engagement as represented in Table 17. The mean score for EEng1 was 3.5750 (SD =0.922) meaning it was higher than the neutral value of '3'. The same was found for EEng2 with a mean score of 4.1516 (SD= 0.620). The test shows that there was a statistical significance, with t (706) =16.583, p<.05 and t (701) = 49.189, p<.05 for Effective communication 1 (EFFCom 1) and Effective communication 2 (EFFCom 2), respectively.

Table 17 One sample t-test for employee engagement

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
EEng 1	16.583	706	.000	.57496	.5069	.6430
EEng 2	49.189	701	.000	1.15157	1.1056	1.1975

5.3.4 Differences between biographic groups on employee engagement

Hypothesis 2b

H_{01b}: There are no differences between the biographic groups on employee engagement

H_{01b}: There are differences between the biographic groups on employee engagement

Hypothesis 1b was tested using a t-test for variables with two groups and ANOVA for three groups (Table 12). A t-test for awareness of mining instability revealed that there were significant differences between the biographic groups on employee engagement (EEng1) with t (697) =-1.137. *p*=0.011. For EEng1 the mean value for those answered "Yes" to the question of awareness was bigger (mean= 3.63, SD=0.89) than those answered "No" (mean= 3.42, SD=0.99) which indicated that there is employee engagement. For EEng2 the mean value for those answered Yes to the awareness question was bigger (mean=4.20, SD=0.55) than those answered No (mean= 4.00, SD=0.79).

Table 18 Independent sample t-test for biographic groups on effective communication

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Breadwinner	EEng 1	-1.137	697	0.256	-0.09927	0.08728	-0.27064	0.0721
	EEng 2	-1.618	692	0.106	-0.096	0.05935	-0.21253	0.02052
Awareness of mining instability	EEng 1	-2.547	697	0.011	-0.20772	0.08156	-0.36786	-0.04758
	EEng 2	-3.712	692	0.000	-0.20151	0.05429	-0.30809	-0.09492

EEng1: No - n = 167 Mean = 3.42 (SD = 1,003) Yes - n =532 Mean = 3.63 (SD = 0,807); EEng2 No-n=171 Mean = 4.00 (SD=0.79) Yes – n= 523 Mean = 4.20 (SD=0.55)

Table 19 represents the ANOVA results for the biographic groups on employee engagement. Of the three groups, education level, job description and mineral mined were found to have a significant difference on employee engagement, thus rejecting the null hypothesis and retaining the alternative null hypothesis that there are significant differences between the biographic groups on employee engagement.

Table 19 ANOVA for biographic groups on effective communication

ANOVA

			Sum of Squares	df	Mean Square	F	Sig.
Education	EEng 1	Between Groups	12.343	4	3.086	3.745	0.005

		Within Groups	559.53	679	0.824		
		Total	571.872	683			
	EEng 2	Between Groups	4.124	4	1.031	2.725	0.029
		Within Groups	255.003	674	0.378		
		Total	259.127	678			
Job description	EEng 1	Between Groups	3.408	3	1.136	1.337	0.261
		Within Groups	593.031	698	0.85		
		Total	596.439	701			
Minerals mined	EEng 2	Between Groups	3.935	3	1.312	3.443	0.016
		Within Groups	263.947	693	0.381		
		Total	267.882	696			
	EEng 1	Between Groups	26.381	3	8.794	10.777	0.000
		Within Groups	573.646	703	0.816		
		Total	600.027	706			
	EEng 2	Between Groups	34.061	3	11.354	33.63	0.000
		Within Groups	235.652	698	0.338		
		Total	269.713	701			

A post hoc test using Bonferroni was employed to understand the pairs of significance of the groups on employee engagement as represented by Table 20. Within this pair, the significant difference was evident between mining certificate and degree with a mean difference of 0.61895 with F (4, 679) =3.745, *p*=0.005. Mining certificate had higher mean of them all as shown in Figure 29 for EEng 1 while for the "Partially completed high school" had the higher mean in the EEng 2 as per Figure 30. Job description's mean plot with regard to EEng 2 is shown in Figure 31.

Table 20 Post hoc test (Multiple comparisons) for employee engagement and education level

Multiple Comparisons							
Dependent Variable	(I) Highest education level	(J) Highest education level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
EEng1	Mining certificate	Degree	.61895*	0.1896	0.012	0.085	1.1529
*. The mean difference is significant at the 0.05 level.							

Figure 29 Mean plot of highest education level with EEng 1

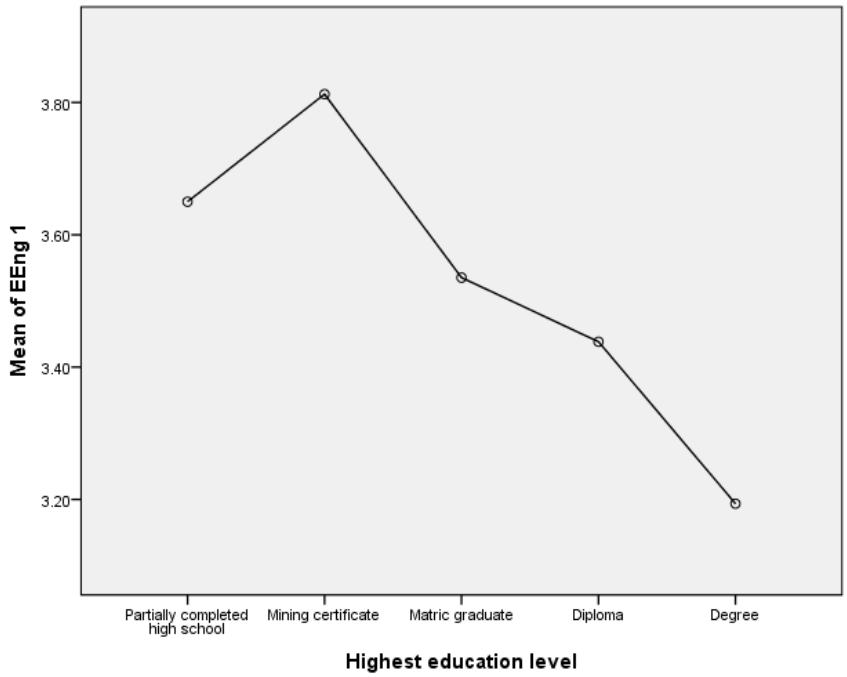


Figure 30 Mean plot of highest education level with EEng 2

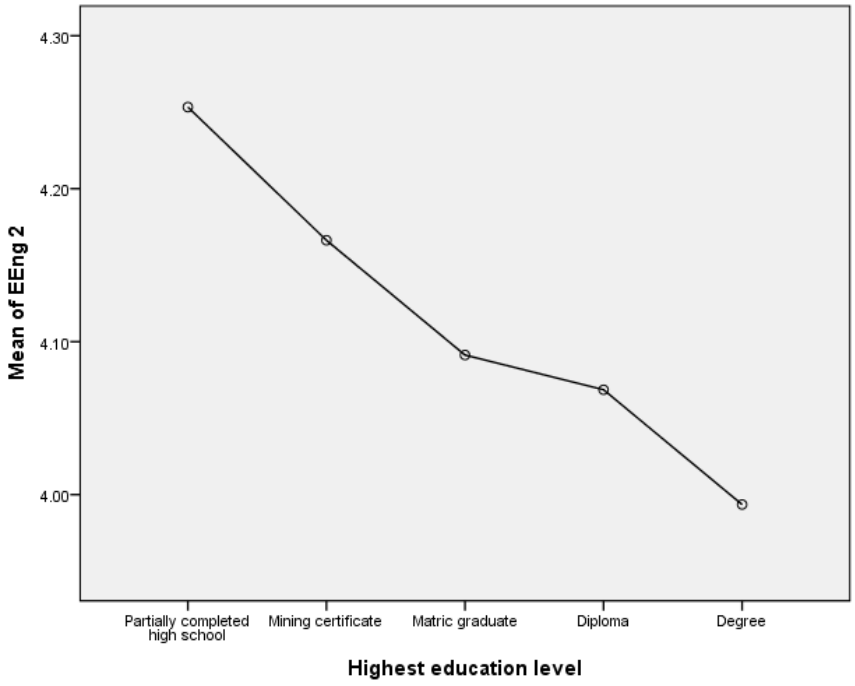


Figure 31 Mean plot of Job description in EEng 2

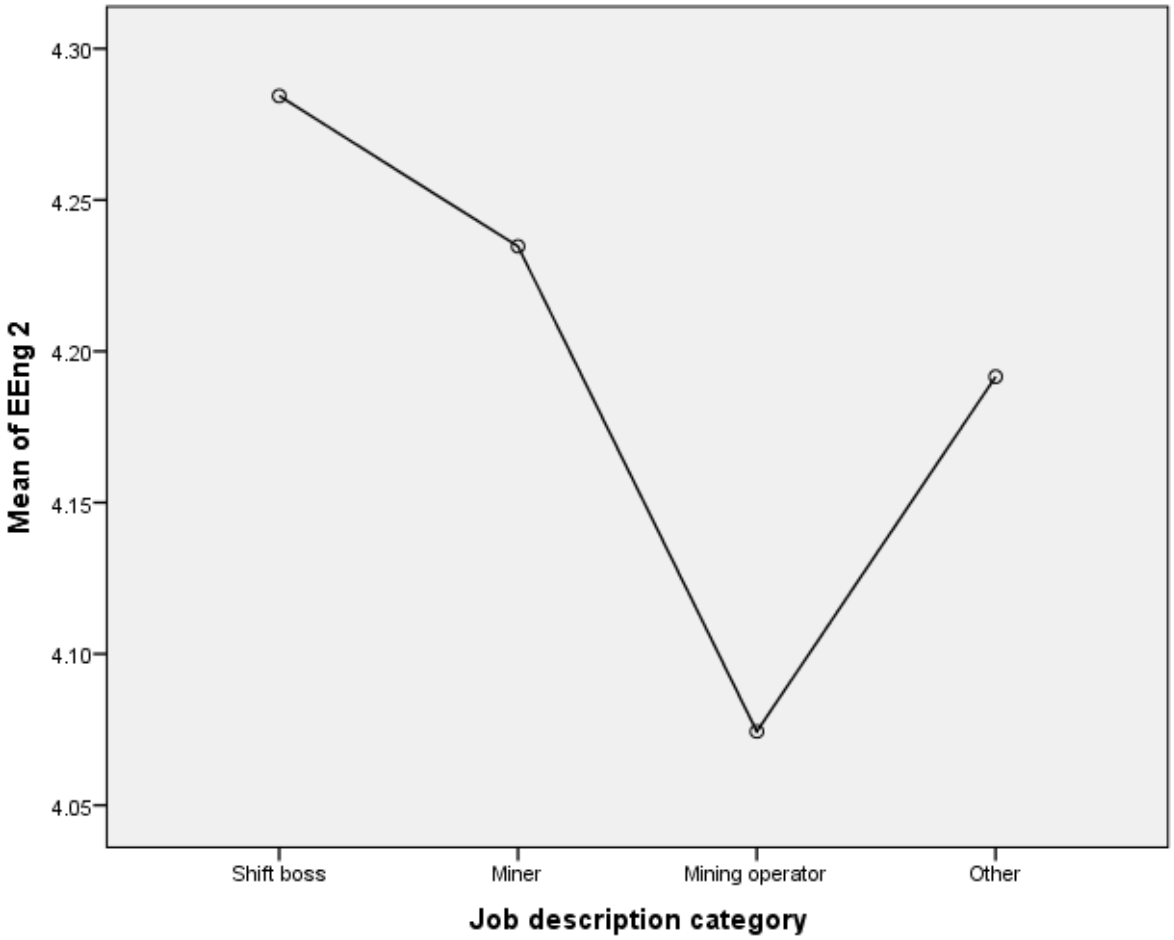


Table 21 represents a post hoc test using Bonferroni of employee engagement on minerals mined. Within this pair, the significant differences were evident between coal and gold with a mean difference of 0.45330; gold and platinum with a mean difference of -0.52086; iron ore and platinum with a mean difference of -0.31944 of with F (3,703) =10.777, *p*=0.000. The Mineral resource mined's means plot is as per Figure 32.

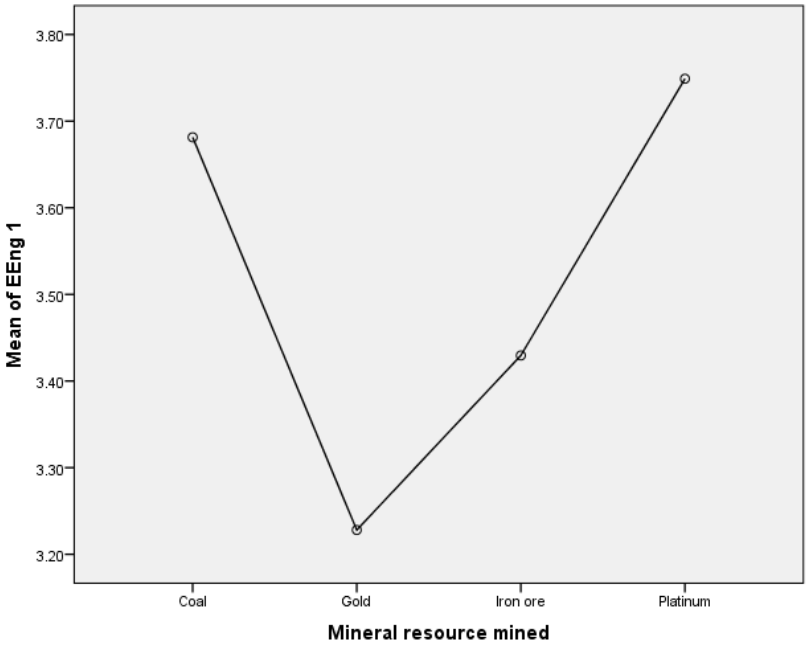
Table 21 Post hoc test (Multiple comparisons) for employee engagement and mineral mined

Multiple Comparisons							
Dependent Variable	(I) Mineral resource mined	(J) Mineral resource mined	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
EEng 1	Coal	Gold	.45330*	0.10563	0.000	0.1738	0.7328
	Iron ore	Platinum	-.31944*	0.09345	0.004	-0.5667	-0.0722
	Platinum	Gold	.52086*	0.10325	0.000	0.2477	0.794
EEng 2	Coal	Gold	-.43261*	0.068	0.000	-0.6125	-0.2527
	Coal	Iron ore	.28362*	0.06232	0.000	0.1187	0.4485

	Gold	Iron ore	.71623*	0.07199	0.000	0.5258	0.9067
	Gold	Platinum	.48050*	0.06641	0.000	0.3048	0.6562
	Iron ore	Platinum	-.23573*	0.06058	0.001	-0.396	-0.0754

*. The mean difference is significant at the 0.05 level.

Figure 32 Mean plot of Mineral resource mined with EEng 1



There was also an evident significant difference between five pairs on effective engagement (EEng2), these were the pairs coal and gold with a mean difference -0.43261; coal and iron ore with a mean difference 0.28362; gold and iron ore with a mean difference of 0.71623; gold and platinum with a mean difference of 0.48050 and between iron ore and platinum with a mean difference of -0.23573 with F (3,698) =, *p*=0.000. Figure 33 and Figure 34 show the means plot of mineral mined with EEng1 and EEng2. In EEng1, gold had the lowest mean while platinum had the highest, while in EEng2, gold had the highest mean and iron ore had the lowest mean score.

Figure 33 Mean plot of minerals mined with EEng 1

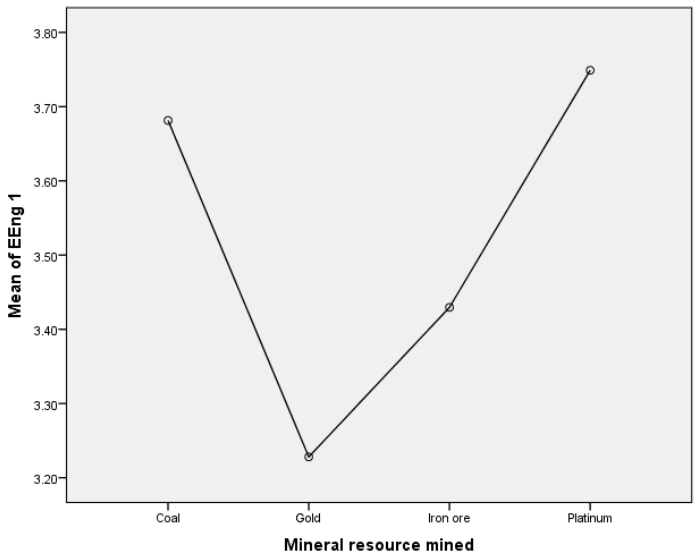
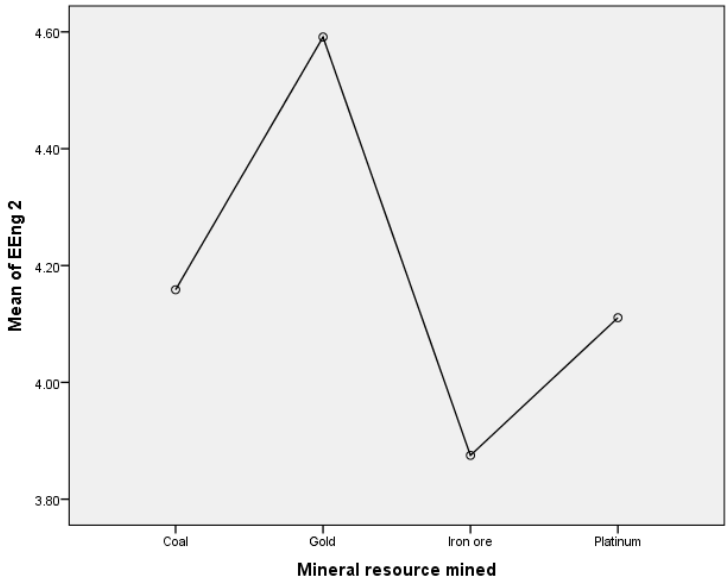


Figure 34 Mean plot of minerals mines and EEng 2

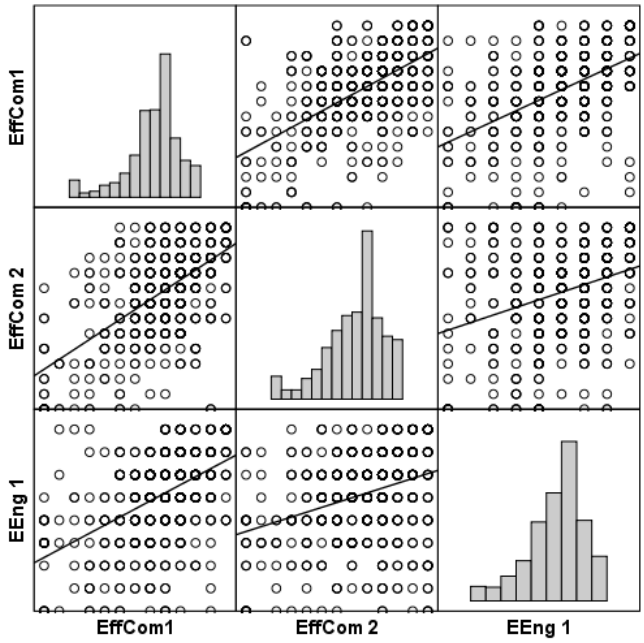


5.4 Effect of communication on employee engagement

5.4.1 Effect of communication on EEng1

A scatter plot was done to visually depict the possible relationship between effective communication (dimensions) and EEng 1 in Figure 35. There is evidence of a positive relationship between EFFCom1 and EEng 1 and EFFCom 2 and EEng1.

Figure 35 Scatter plot of Effective communication and EEng 1



A Pearson correlation (r) was conducted to understand the significance, direction and strength of this relationship as shown in Table 22. To determine the level of the strength, the guidelines of Palant (2010) were used (None: r = 0 – 0.09, small: 0.10 – 0.29, medium: 0.30 – 0.49, strong ≥ 0.50). Table 22 presents the Pearson correlation results for effective communication dimensions and EEng 1. The results show that there was a significantly strong positive relationship between EFFCom1 and EEng 1, r (700) = 0.505, p<.01. For EFFCom2 and EEng1, there was also a significantly positive relationship but of medium strength, r (665) = 0.329, p <.01.

Table 22 Pearson correlation for effective communication dimensions and EEng 1

		EFFCom1	EFFCom 2	EEng 1
EFFCom1	Pearson Correlation	1	.594**	.505**
	Sig. (2-tailed)		.000	.000
	N	715	668	700
EFFCom 2	Pearson Correlation	.594**	1	.329**
	Sig. (2-tailed)	.000		.000
	N	668	674	665
EEng 1	Pearson Correlation	.505**	.329**	1
	Sig. (2-tailed)	.000	.000	
	N	700	665	707

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

A linear regression analysis was conducted for the two dimensions of effective communication and EEng1 as per Table 23.

Table 23 A linear regression of effective communication dimensions and EEng1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.498a	0,248	0,246	0,79997

a. Predictors: (Constant), EFFCom 2, EFFCom1

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	138,762	2	69,381	108,415	.000b
	Residual	419,813	656	0,640		
	Total	558,575	658			

a. Dependent Variable: EEng 1

b. Predictors: (Constant), EFFCom 2, EFFCom1

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,590	0,145		11,002	0,000
	EFFCom1	0,504	0,045	0,469	11,126	0,000
	EFFCom 2	0,046	0,041	0,047	1,107	0,269

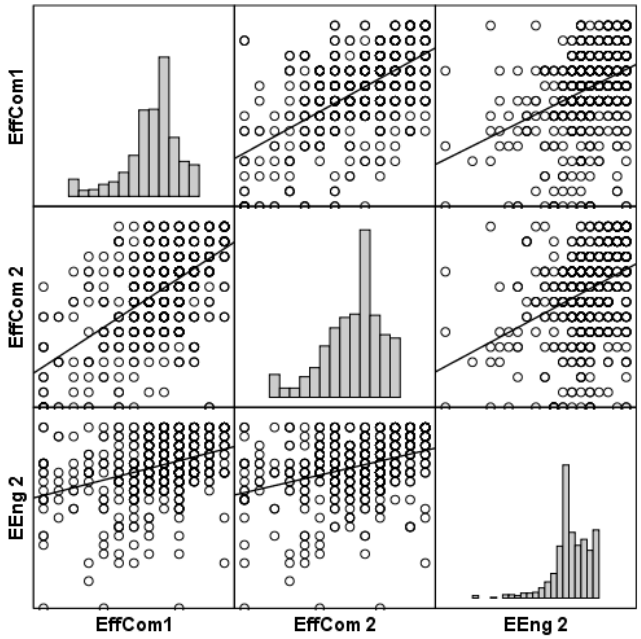
a. Dependent Variable: EEng 1

The model summary model shows an R-square of 0.248 and an adjusted R-square of 0.246. Specifically, the results (R^2 = .248; p <.01) suggests that effective communication (EFFCom1: β = 0.504, p <.05) increase employee engagement by 24.8%. There was no increase from the EFFCom 2 as the p-value was not significant (β = 0.046, p = .269). Based on the results, it can be concluded that the null hypothesis is rejected and the alternative hypothesis is accepted, which indicate the presence of a positive relationship between effective communication dimensions and EEng 1.

5.4.2 Effect of communication on EEng 2

The scatter plot of EFFCom1 and EEng 2 and EFFCom 2 and EEng 2 shows evidence of a positive relationship between these sets of variables (Figure 2).

Figure 36 ***Scatter plot of Effective communication and EEng 2***



The Pearson correlation of EFFCom 1 and EEng 2 indicates a medium positive correlation, r (695) = 0.368, p <.0, while there was also a medium positive correlation between EFFCom 2 and EEng2, r (661) = 0.355, p<.01 as per *Table 24*.

Table 24 Pearson correlation for effective communication dimensions and EEng 2

		EFFCom1	EFFCom 2	EEng 2
EFFCom1	Pearson Correlation	1	.594**	.368**
	Sig. (2-tailed)		0,000	0,000
	N	715	668	695
EFFCom 2	Pearson Correlation	.594**	1	.355**
	Sig. (2-tailed)	0,000		0,000
	N	668	674	661
EEng 2	Pearson Correlation	.368**	.355**	1
	Sig. (2-tailed)	0,000	0,000	
	N	695	661	702
**. Correlation is significant at the 0.01 level (2-tailed).				

A linear regression shows, R-square of 0.158 with adjusted R-square of 0.155 in Table 25.

Table 25 A linear regression of effective communication dimensions

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.398[a]	0,158	0,155	0,57318

a. Predictors: (Constant), EFFCom 2, EFFCom1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40,199	2	20,100	61,179	.000[b]
	Residual	214,205	652	0,329		
	Total	254,404	654			

a. Dependent Variable: EEng 2

b. Predictors: (Constant), EFFCom 2, EFFCom1

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	3,061	0,103		29,849	0,000
	EFFCom1	0,162	0,032	0,225	5,022	0,000
	EFFCom 2	0,144	0,030	0,219	4,878	0,000
a. Dependent Variable: EEng 2						

This means that 15.5% of the changes in employee engagement due to effective communication can be explained by EFFCom 1 (β = 0.162, p <.05) and EFFCom 2 (β = 0.144, p <.05). In this regard, it can be concluded that the null hypothesis is rejected and the alternative hypothesis *(H_{31b})* is accepted.

5.5 Chapter summary

In this chapter, the findings were presented which were based on 723 participants. Construct validity with factor analysis and reliability was done to confirm the two constructs of study, which were effective communication (independent variable) and employee engagement (dependent variable). Three hypotheses were tested. Hypothesis one confirmed that the level of effective communication was high, and there were some significant differences between the levels among the different education qualification, mineral mined and awareness about the instability in the mining industry. There were high levels of employee engagement with difference found among the groups in education qualification, mineral mined and awareness about the instability. Hypothesis three results confirm that there was a relationship between effective communication and employee engagement. These findings are discussed in Chapter 6 and compared with the theory in Chapter 2.

Chapter 6

Chapter 5 showed the results from the study which were gathered by using the questionnaire as a data gathering tool. This study took place in four mining commodities, namely, coal, gold, platinum and iron ore. 1000 questionnaires were distributed and 723 of them were returned. The aim was to determine the levels of engagement in each commodity, if the communication was effective across the mining industry and if effective communication has an impact on the employee's engagement levels.

Chapter 6 will discuss the findings from chapter 5, referencing back to literature where necessary. It will further reaffirm chapter 2 discussions or make suggestions and recommendations based on the findings from chapter 5.

6.1 Main findings

The overview findings of Chapter 5 were as follows:

- There is effective communication in the South African mines.
- The employee engagement in the South African mining industry is high.
- Effective communication has a direct impact on the employee engagement levels.

Where significant differences were evident, such results will be discussed in greater detail in the sub-sections to follow.

6.1.1 Effective communication

As per the analysis in chapter 5, effective communication is represented by two elements, EFFCom 1 which represents the quality and the reliability of the information received, and EFFCom 2 which represents the communication climate.

6.1.2 Employee Engagement

As per analysis in Chapter 5, Employee engagement is represented by two elements, EEng 1 which represents the workplace environment and EEng 2 which represents the individual characteristics. The elements that make a significant difference on employee engagement were found to be “Awareness of mining instability”, “Education”, “Minerals mined” for EEng 1 and “Awareness of mining instability”, “education”, “minerals mined” and “Job description” for EEng 2.

6.2 Research hypothesis 1: There is an effective communication at the mines in South Africa

The results indicate that overall across all the commodities there is effective communication in the South African mining industry. The mean score was higher than 3 for both EFFCom 1(Quality and reliability of information received) and EFFCom 2 (Communication climate). EFFCom 1 has a mean of 3.60 with the standard deviation of 0.869. EFFCom 2 has a mean score of 3.61at a standard deviation of 0.938. This therefore indicates that the majority of the participants of the study agree that there is effective communication, this being tested through the quality and the reliability of the information received and also through the communication climate.

Sixty-five percent of the mine employees feel that they are receiving a quality and reliable information from the organization management, 19% feel that the quality and the reliability is neutral, while 16% are not satisfied with the quality and reliability.

On the EFFCom 2, 61% of the employees feel that they have a positive communication climate, 23% feel that it is neutral, while 16% feel the communication climate is not positive

On the overall 63% of the employees feel that there is effective communication at the mine, 21% are neutral about this, while 16% feel there is no effective communication in their working areas.

From the questionnaire, there were only three aspects that had a significant impact on EFFCom 1 and two that had an impact on EFFCom 2. All of those aspects will be discussed in the sections to follow.

6.2.1 Effective communication with regard to education level

The study took education into consideration separating it into those who partially completed high school, mining certificated, matric graduate, diploma holders and then degree holders. Education levels were found to have a significant difference on effective communication, this significant difference was more evident between those who partially completed high school and the matric graduates.

From chapter 5 data analysis, On the EFFCom 1 the results showed that those who had partially completed high school believe that the quality and the reliability of the information they are receiving is high while those with a diploma and a degree believe that it is low. The quality and reliability of the information received declines with the increasing education level. With this one can infer the following:

- The quality and reliability of the information being provided is good enough for the less educated.
- The more educated ones, degree and diploma holders feel that the information is not good enough. This may be due to the information that they have had to deal with in their studies at the tertiary levels.
- The quality and reliability of the information shared at the mine is only tailored for those with lower literacy and the educated are not satisfied with this, they feel that more can be done to cater for them through giving them high quality and more reliable data.

From chapter 5 data analysis, On the EFFCom 2 those who had partially completed high school felt that they had a good communication climate. A good communication climate is the one that allows for a comfortable two-way communication between the employee and the supervisor (Mbhele, 2016). Those with diplomas feel that communication climate is not good. The following can be inferred from this:

- The less educated feel that the climate is good enough for them to air what they want to the supervisors. Most likely the communication is based on basic issues at the mine that are relatively easy to address. The existence of the unions allows protection to the employees which may have an impact on how the supervisor interact with those who are unionised, who in this may be the ones who partially completed high school.

- Those with diplomas may be feeling too confined as the level of communication is below what they got exposed to when they were at varsity. They may also be feeling confined due to a fear of victimisation of the supervisor who may be taking them as a threat to their positions or who may feel that they are questioning their intelligence during a two-way conversation.
- Recommendations
    - Cater for all the members by having sections to address everyone, this can be done through the overview communication and then in the same communication have the detailed for those wanting to go into detail.
    - Allow for a two-way communication by being able to discuss the information provided further. This can be through a face to face communication or electronic means like email or telephone, even social media where there is no sensitivity on the information being shared.
    - Educate the supervisors on different levels of engaging employees based on their qualifications.
    - Where possible pair the graduate employees with the graduate supervisors. This may improve the communication climate for the graduate employees as they may feel less confined in terms of the questions they can ask and the supervisors may also feel less intermediated which improves the quality of the interaction between the two.

6.2.2 Effective communication with regard to awareness of mining instability

The study took into consideration the awareness of the employees with regard to the economic instabilities that the mining had gone through. The majority of the respondents, as per the data analysis done in chapter 5, were aware of the instability. This group felt that the quality and reliability of information being shared with them was satisfactory. From this the following inferences were made:

- The mine management shares regular communication with the employees to make them aware of the mining instability.
- The information being shared has a quality and reliance catering for the majority of the employees.
- Recommendations

- Ensure the people are continuously informed with as much accurate and reliable information as possible to avoid rumours which may degrade the quality and reliability.
- Ensure the communication is head from an organisation first before the media as this may also degrade the quality and the reliability of the information.

6.2.3 Effective communication in relation to the mineral commodity

The study took place in four different commodities, namely, coal, gold, iron ore and platinum. From the data analysis in chapter 5, the results show the type of mineral commodity being mined to have a significant difference on effective communication. The significant difference was evident when comparing gold and iron ore and between iron ore and platinum. On the quality and reliability of information received (EFFCom 1) gold had the highest mean followed by platinum; this means that the participants are receiving high quality and reliable information from the management on these two commodities. By this, it means the top-down communication is good as rated by the employees themselves. Iron ore and coal receive a relatively low quality and reliable information. From this, the following can be inferred:

- The top-down communication in the gold mine is relatively the best providing the employees with high quality and reliable information. The communication can be like this due to high safety concerns in the gold mines and the complexity of mining that over the years they had to continuously develop better communication systems. In an attempt to also reduce attrition between employees and management due to demands the management respond promptly to avoid mine stoppages which come highly costly.
- Iron ore has a poor top-down communication. The mining of iron ore is relatively simple since it is a tabular mineral at relatively shallow depths and it is also more mechanised. The management may, therefore be looking at communication as monotonous as something new hardly happens. The employees may be having fewer demands due to most of their needs that are being met and therefore the need for top-down communication being perceived as low.

On the communication climate (EFFCom 2) however platinum had the lowest meanwhile gold still remained with the highest mean. For platinum this means that the employees are not happy with the communication climate. From this the following can be inferred:

- Platinum mines have the lowest bottom-up communication due to poor relationship between employees and supervisors. This may be the explanation for the more frequent, long and violent protests in this industry. In the absence of the employees not being listened to they may end up resorting to protests which is not the ideal way of resolving disagreements as it costs a lot to both parties, the end result may end up being loss in profits, wages and jobs to name a few.
- Gold's communication climate is relatively the best. This means that the communication between the employees and supervisors is good, this creates a harmonious environment. This may be due to a highly perceived danger of the gold mining and both the employees and supervisors may have realised that the only way to conquer is by being united.
- Recommendations
    - The management communication in the gold sector should be looked at and part of it be copied across the commodities
    - The simplicity of the mineral winning should not be taken as a token to allow for less top-down communication as in the absence of communication any form of communication may be taken and lead into dire situations, this also allows for the build-up of complacency in the working area.
    - Good top-down communication should be practised as this will save the mines during disputes and also in the legal matters.
    - In order to minimise protests the communication climate has to be improved, this can be done by ensuring a good communication relationship between supervisors and employees and ensuring that employees are given a hearing ear and given a good prompt feedback.
    - The gold methods in ensuring a good communication climate can be something to learn from across all the commodities in order to improve.

6. 3 Research hypothesis 2: There is employee engagement in the mines in South Africa

From the data analysis in chapter 5, employee engagement was found to be high in the South African mining industry. The study tested two constructs which were Workplace environment (EEng 1) and Individual Characteristics (EEng 2). Hlapho (2015) in his thesis explains that the workplace environment that will stimulate a positive employee

engagement should be harmonious and with a meaningful workplace environment including necessary tangible resources, workplace with a supportive climate and a high perceived level of safety. The individual characteristics talk to the employees state where they are emotionally and intellectually committed to the organisation through their head, heart and hands (Rao, 2017).The EEng 1's significance was found to be in three elements of the questionnaire while that of the EEng 2 was found in four elements. All these elements will be looked at in the sections below.

With regard to the "Workplace Environment" (EEng 1), 61% of the employees feel that they have a positive workplace environment, 23% feel that it is neutral, while 16% feel that the environment is negative.

With regard to "Individual characteristics" (EEng 2), 86% of the employees have positive individual characteristics, 10% are neutral, while 4% have a negative individual characteristics.

The overall employee engagement in the mining industry is standing at 78% of the employees who are positively engaged, 14% who are neutral, while 8% are negatively engaged.

The results do not differ much from the recent study that took place in one of the mining organisation that also formed part of this study. There obtained 81% employee engagement score versus the 78% that this study got. That organisation got 83% on the positive "Individual characteristics" while this study showed 86%.

6.3.1 Employee engagement with regards to the awareness of mining instability

The study included the aspect of awareness of the mining instability in the mining industry. From chapter 5 data analysis, this aspect was found to have a significant difference with regards to employee engagement in results section. It shows that those who are aware of the mining instability were better engaged than those who did not. The finding was on both EEng 1 and EEng 2. With this finding the following can inferred for EEng 1(Workplace environment):

- During instability times the management implement intervention strategies within the elements that are within their controls, this helps in the improvement of employee engagement. The employees equally participate in this environment building as they will be equally yearning for survival.

On the EEng 2 which are the individual characteristics the following can be inferred:

- When there is instability in the mining industry the employees tend to be more engaged in their jobs to ensure that they keep them as employability in the industry might be low.
- In times of instability the employees may do their part to ensure that they keep their industry surviving the instability stage.

- Recommendations
    - The mines should ensure that all the employees are aware of the economic instability in the mines as it shows that it shows that it has a positive effect on employee engagement
    - During the uncertainty times when management or both management and the employees apply intervention tactics they should still ensure that they maintain or up the workplace to be harmonious, meaningful and remain supportive to its employees as this improves employee engagement

6.3.2 Employee engagement with regards to education levels

Employee engagement section had education as part of what the results deem to be part of the determinants of employee engagement. The results proved this on both EEng 1 and EEng 2 where EEng 1 is the workplace environment and EEng 2 represented individual characteristics.

On EEng 1 the employees with the mining certificate said the workplace environment was conducive to a positive employee engagement, they were followed by those who partially completed high school, matric graduates, diploma and then finally the degree. The degree and the diploma holders believe that the workplace environment was not contributing positively to the employee engagement.

From this the following can be inferred:

- The less educated are happy with the current working environment and hence it can trigger positive employee engagement within them. The mining certificated employees particularly agree with this since they feel that their certificate is relevant to the area where they are employed.
- The ones with better education feel that they deserve more than what the mines currently offer. They may be feeling that they did not have to invest too much in education as they are sharing the environment with people who are less

educated than them but still getting the same or even greater benefits than them.

- The workplace environment may not be as harmonious due to a possible attrition between the lower education employees and the higher education ones.

On the EEng 2 those who partially completed high school had the highest mean, while those with a degree and a diploma came at the lowest. From this one can make these inferences:

- The relatively lesser educated people have best individual characteristics that lead to a positive employee engagement compared to others. This may be due to the feeling of contentedness with them having jobs that enable them to survive in their society despite their education level and also maybe being in the same pool with those who are better educated than them.
- The more educated people's individual characteristics are at the lowest because they may be feeling that their education levels are being undermined and underutilised. They may also be feeling negative with sharing the same pool as those who are less educated as it proves their efforts to be better learned useless in their current environment.
- Recommendations:
    - The people should be awarded according to their qualifications and experience. Studying further should be encouraged through incentives so that it may not seem as the bad thing in the mining industry.
    - The career path should be clear and adhered to as much as possible in terms of the time span and requirements for the graduates in order not to make feel like their environment is not supportive of their career.

6.3.3 Employee engagement with regards to minerals mined

The minerals being mined was also put in the questionnaire to see if it had a relationship with employee engagement. From chapter 5 analysis, the overall finding for both EEng 1 and EEng 2 there was a relationship found. The results on the EEng 1 platinum was found to have a better workplace environment to positively influence employee engagement while gold was found to have the worst working environment to positively affect employee engagement. With this the following can be inferred:

- The platinum mines workplace environment is a harmonious and a meaningful workplace environment including all the required tangible resources, a

workplace that is supportive. Employees and departments in the platinum mines may not be of assistance to each other.

- The gold mines' workplace is not positively contributing to the employee engagement. The whole mine may be showing signs of the same team, playing together in support of one another and not against.

EEng 2 which is "the individual characteristics" was also used as one of the elements and was found to be a determinant of employee engagement in the mining industry. Iron ore was to have the lowest mean, this meaning that the "individual characteristics" were relatively low in contributing positively to the employee engagement. Gold shows to have the highest mean with the majority of the employee showing their individual characteristics contributing positively to the employee engagement. With this the following can be inferred:

- The gold mining personal are better engaged than all the commodities with the employees committing themselves emotionally and intellectually to the organisation goals. This effect can possibly be brought about by the high quality and reliable information they receive and also the highly regarded communication climate.
- The iron ore is the worst with less individual characteristics from the employees that will positively contribute to the positive employee engagement. This can be due to relatively poor quality and reliability of information received and a poor communication climate.

In EEng 1 the results found was that platinum followed by coal had the best working environments conducive to employee engagement while gold shows to have the worst one of them all. From this one can infer the following:

- Platinum and the coal employees feel that their working environment is harmonious and create a feeling of meaningfulness. This may be due to the perception of being well paid and with platinum's recent retrenchment the workload per employee may have increased which makes them more needed.
- The gold mines' challenge may be due to high life-treatening hazards like rock falls and the illegal miners relative to other mines; this may be making them to have some negativity towards their working environment which shows to have a negative impact in their engagement.
- Recommendations

- The working place environment should be harmonious in terms of how people interact with one another, employees should have access to all the resources they require to execute to roles, the environment should be supportive to one another with the understanding that for a business to run effectively all the departments should run effectively and that will be possible through interdepartmental assistance.
- The change to a positive working environment will require a need for a culture change. One of the things to be changed is to ensure that the helping of one another is not viewed as a favour but rather as a responsibility.
- Improve the effectiveness of communication which in turn may increase the individual characteristics and help in improving the positive workplace environment.
- Continue striving for the safest environment where employees will feel as safe at work as they are out of the work area.
- Work on a lean employee budget where each employee will have a workload that is enough to make them feel needed, for extra responsibilities.

6.3.4 Employee engagement with regards to Job description

From chapter 5 data analysis, job description was found to only affect one of the aspects of the employee engagement and that is the “Individual characteristics” (EEng 2). The job profile affected the employee engagement negatively the lower the ranks. The shift bosses come out as the highest in terms of employee engagement in the EEng 2 while the Mining operators came at the lowest. From this the following can be inferred:

- High employee engagement is experienced with higher job profile. This can be due to the more understanding of the organisation vision and mission and where you fit in terms of contributing to it with your position. With position also comes power so those on the higher posts may be going an extra mile to ensure they retain this power.
- The mining operators are relatively a lot and they may think that their individual characteristics do not matter as they will not make much difference anyway. They may also be feeling less important in the organisation relative to their colleagues who are in higher roles.

- Recommendations:
    - The vision and mission of the company should be known by all the employees and they must be shown where they fit in. The mining operators are the pillars of the mines as they are the ones producing the good that is being traded; they must be made to feel more important, this should not only be in sayings but also in feedback and actions.

6.4 Research hypothesis 3: Effective communication in the mines has positive influence over the employees' engagement

From chapter 5 analysis, the results showed that effective communication has a positive contribution to the employee engagement. The study showed that effective communication can increase employee engagement by 24.8%. By this the following can be inferred:

- Improving communication in a mining organisation can improve employee engagement by up 24.8%
- Improving communication can be relatively cheap and easy versus other determinants of employee engagement
- Improved employee engagement will see an organisation benefit from outcomes as per literature, examples to this can be increased productivity, lower costs, lower employee turnover, lower absenteeism and increased safety.
- Effective communication can be made to be a culture by learning through the gold industry which has proven to have better communication relative to other industries on both EFFCom 1 and EFFCom 2.

6.5 Conceptual framework for effective communication as a tool to improve employee engagement in the mining industry

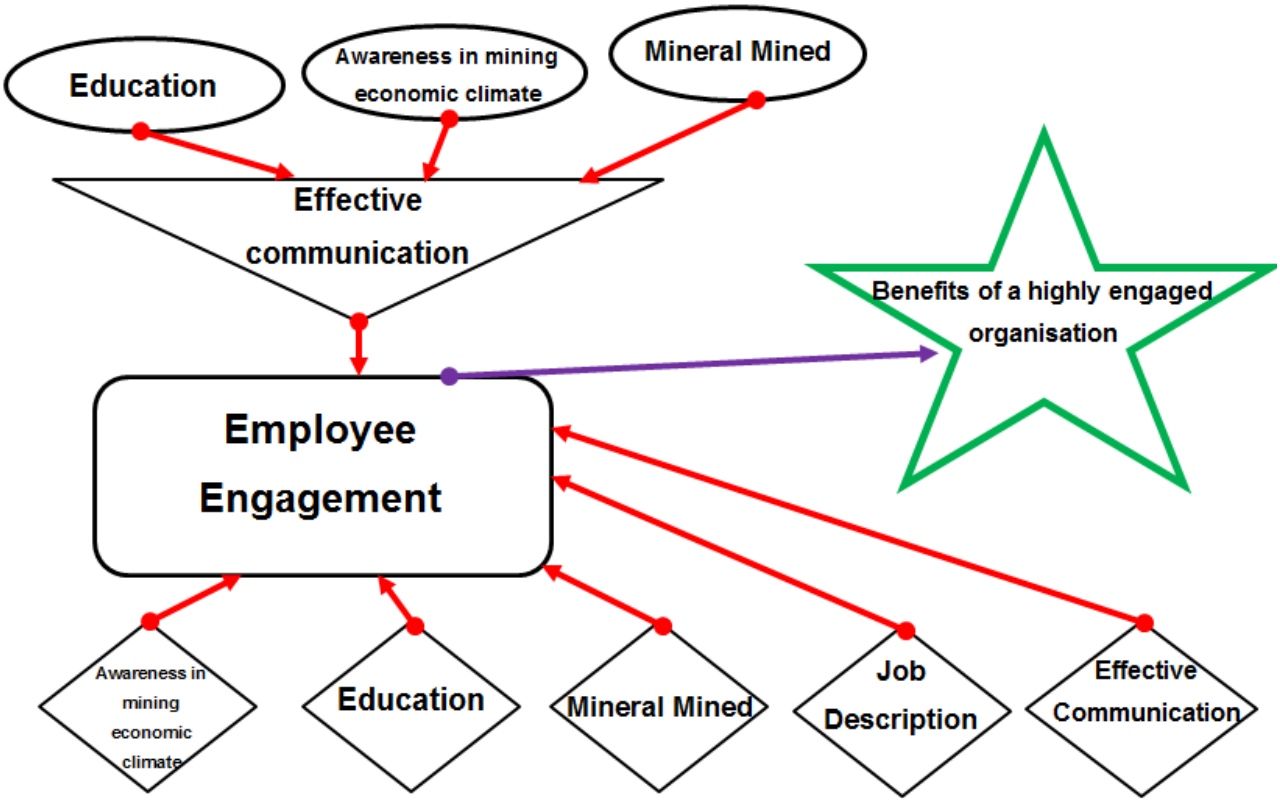
From the results discussed and the literature reviewed; the framework has been developed (Figure 37**).** The model shows three critical components, namely, effective communication, employee engagement, and the employee engagement outcomes. The results show that to have an organisation with effective communication there should be an investment in education and there should be means to ensure that employees are constantly made aware of the industry economic affairs, especially when there is uncertainty. The study also shows that the type of mineral being extracted also makes a difference, here cross-pollination must take place to determine what various commodity mines are doing to improve their communication methods in

order to ultimately have effective communication. Effective communication will then contribute to the employee engagement, 15.5% of the changes in employee engagement are explained effective communication, with effective communication being able to increase employee engagement by up to 24, 8%.

Certain biographical elements have shown contribution towards employee engagement. Ensuring that employees are aware of the mining economic climate, high levels of education and improved communication methods show that they have direct contribution to employee engagement levels. There is also a contribution in terms of the mineral mined and this can be taken advantage of through cross-pollination learning between various commodity mines. The job description shows that the higher one goes in terms of job bands the more engaged they become. Mines can cater for this by creating and enforcing career paths, seeing the potential for growth in the company will contribute positively to the employee engagement.

Employee engagement brings about multiple benefits as discussed in the theory, increased productivity which may translate into better production, reduced operating costs, low labour turnover, low safety accidents and low absenteeism being some of the benefits.

Figure 37 Effective communication and Employee engagement model in the South African mines



Chapter 7: Recommendations

Chapter 6 discussed the outcomes of the results. Chapter 7 consolidates all the findings from the first chapter up to the last one. The most critical part about this chapter is to show that the objectives that were mentioned in Chapter 1 have been met.

7.1 Chapter 1 research objectives

In Chapter 1 the objectives of the study were formulated and outlined. The study aimed to see if there was a link between effective communication and engaged employees.

According to Kahn (1990) in the paper titled *Psychological conditions of personal engagement at disengagement at work,* when there is a negative impact on the engagement the following can be seen:

- A decline in the voluntary work attendance
- Self-defensiveness
- Bureaucracy
- Self-estranged
- Estranged workforce
- Effortless
- Lack of empathy
- Refraining from investing ideas
- Lack of excitement/Happiness
- Anxiety
- Negative psychological meaningfulness

The objectives of the research will, therefore, be to determine:

- How effective is the communication in the mining industry
- The drivers of engagement in the mining industry

- The effects of poor communication to employee engagement
- The consequences of lack of engagement to the mining sector

7.2 Principal findings

The main aim of the study was to see if there was a relationship between communication and employee engagement. The results in chapter 5 discussed showed that effective communication can affect employee engagement positively. The results in fact showed that **15%** of employee engagement takes place because of communication while communication can improve employee engagement by up to 24.8%.

7.2.1 Determining the effectiveness of communication in mining

The communication was proven to be effective. 65 % of the employees felt that they are receiving quality and reliable information. 61% felt their communication climate was a positive one encouraging them to be more engaged. Overall the conclusion was that the communication at the mines is effective with 63% agreeing to this. With the growing literacy levels in this industry; this calls for action in terms of ensuring inclusivity of the educated when coming to the issues of communication. Ignoring this will lead to reduced employee engagement.

7.2.2 Determining if there is positive employee engagement in mining

The industry has proven to have a positive employee engagement. This was measured by two aspects, the workplace environment factors and the individual characteristics. 61% of the employees believe that they have a positive workplace environment conducive to positive engagement. 86% have positive individual characteristics which contribute positively to the employee engagement. With the two aspects the study shows that there is 78% engagement in the South African Mining industry.

Employee engagement‘s determinants show five aspects being the awareness in the mining economic climate, education mineral mined, job description, and effective communication. Education point show that the group with low literacy was the more engaged in terms of the workplace environment and also being the larger group that possessed the positive individual characteristics. The challenge is the continuously growing literacy in the mining employees’ literacy. With this it means that the workplace environment and the individual characteristics elements cater for all the levels of literacy.

7.2.3 Increasing employee engagement through effective communication

The study has proven that effective communication can yield a positive employee engagement. To ensure that this, the research suggests that the model in Figure 37 should be followed. That is to ensure there is effective communication and to do that the elements discussed effective communication section should be implemented. The study also shows that other factors that will assist in increasing the employee engagement will be through the addressing of the listed demographic elements.

7.3 Implications to management

With the implications of education affecting employee engagement management have to improve their communication methodologies and catering for the educated as well. With the literacy levels that have been continuously increasing in the industry some of the current methods are getting outdated.

The Leon commission (1994) identified that the general levels of the mine workers was woefully inadequate. The commission decided at that point that it will invest in education moving forward in the mining industry. This emancipated in the increased number of adult learning centres and improved learning in the mining sector.

(Stanton, 2003)

Now the mining charter requires that all mining companies invest 5% of the annual payroll into skills development (Baxter, 2017). According to SRK Consulting (2015) in 2015 the number of graduates in the mining-related fields has grown substantially. With this it is clearly inevitable that the future mining employees will be better literate and will therefore need to be communicated with differently while still ensuring that their engagement levels are high.

Other key elements of improving employee engagement are through awareness of instability, type of the mineral mined, job description and communication that is effective. In all of these, management can pick low hanging fruits that can be addressed almost immediately to start on improving the employee engagement. Those would be the learning from other commodities in terms of the best practices, ensure that the employees are kept aware of the economic mining climate, and finally ensure there is effective communication by improving the quality of information being shared and developing a positive communication climate. Frank Cervon, (2014) suggests that communication takes place through a storytelling format as it encourages collective

sense-making where employees assist each other to understand the message being transmitted, this enhances potency of communication.

Bandura and Lyons (2017) support some of these findings highlighting that with regard to education, employees must be provided with opportunities for training and development, mentoring and coaching on short and long-term goals; with regard to effective communication provide clear expectations and structured feedback to employees, giving employees voice, providing access in matters that concern them; on job growth issues, opportunities should be created for advancement and there should be clear policies on promotions.

In the avoidance of the Marikana massacre where thirty-four miners were killed according Magaziner and Jacobs (2013), the communication climate must improve. The study indicates that the employees in the platinum are happy with the management communication however they have poor bottom-up communication, this may explain the violent protests. In order to minimise the protests the communication climate has to be addressed. Management need to look at what is the current perception between the employees and management relationship; this can be done through a survey similar to the one that the researcher used.

7.4 Limitations of the research

The research was done in snapshot format, with only the cross-sectional information being in place, that is from July 2017 until September 2017. This therefore means that one cannot develop the trend in the effective communication and employee engagement.

The study was planned to have an equal number of representatives per commodity with a thousand participants being 250 per commodity. This did not happen that way therefore leaving other commodities relatively under or over-represented.

7.5 Suggestions for future research

During the study there are some elements that the researcher came across that could be learned further, those are as follows:

- Effective communication
    - A study on how the various education levels can be engaged in the mining industry

    - A study on how to create a positive communication climate in the mining industry
- Employee engagement
    - A study on how to ensure a consistent positive employee engagement in the area of mixed literature levels

7.6 Conclusion

The current story has shown employee engagement to be affected by many objects, with the highly educated ones not feeling happy in terms of the communication climate, the quality of information they are receiving, the workplace environment and the individual characteristics. This needs to be addressed as there is a growing literacy in the mining sector otherwise there will be employee engagement issues in the near future. This is due to that numbers show high level of employee engagement lies with those who have lesser education levels in this study.

With this all the objectives of this study have been covered and effective communication can improve employee engagement in the mining industry.

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Appendices

Appendix 1: Questionnaire

Topic: Effective communication as a tool to increase labour engagement during uncertain times in the mining sector

Demographic questions:

1. Under which job description do you fall under?

Shift boss/Mining Foreman	Miner	Mining Operator	Other

2. What is your highest educational level?

Partially completed high school	Mining certificate	Matric graduate	Diploma	Degree

3. The mine you are currently working in; what mineral do you mine?

Platinum	Coal	Gold	Iron ore

4. Are you aware whenever the mining industry goes through an economic instability?

Yes	No

5. Are you the only breadwinner at home?

Yes	No

Effective communication:

Description	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Your superior(s) provide you with the type of information you really want and need.					
You are satisfied with the explanations you get from top management about why things are done as they are.					
You expect that recommendations you make will be heard and seriously considered.					
Your feel free to challenge your superior when you disagree with them.					
Your superior listens to you when you tell him/her about things that are bothering you?					
You feel safe and protected when you tell you superior about things that have not gone well at work?					

Employee engagement

Description	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
You get excited about going to work?					
Would you recommend your organisation, as a good place to work in?					
Looking back over the past year or so, your organisation has become a better place to work in?					
I am willing to take on new tasks as required by my manager.					
Do you take the initiative to help your colleagues with their work, when the need arises?					
Does your team help you to complete your work?					
Do you suggest solutions to problems that arise in your team or workspace?					
When you receive feedback on your performance, are you able to respond positively?					

Appendix 2: Certification of data analysis support

I hereby certify that:

*I **retained the services of a statistician** in running the data analysis for my research report*.

Contact name and details of the statistician:

NAME: Mr. Andile Mtotywa

EMAIL ADDRESS: andile@alchemyhub.co.za

CONTACT NUMBER: +27 73 373 1453 / +27 72 636 5977

I hereby declare that all *statistical interpretations/ analysis and write-up of the results for* **my study was completed by myself without outside assistance**

Name of student: Bokang Thomas Kelepa

Signature:

…….

Student number: 12228606

Student email address:

12228606@mygibs.co.za / bkelepa@gmail.com

Appendix 3: Codebook

Variable Information

Variable	Position	Label	Measurement Level	Role	Column Width	Alignment	Print Format	Write Format
No.ofRespondents	1	No. of Respondents	Scale	Input	14	Right	F4	F4
@1.Undewrwhichjobdescription doyoufallunder	2	Job description category	Nominal	Input	15	Right	F15	F15
@2.Whatisyourhighesteducatio nlevel	3	Highest education level	Nominal	Input	14	Right	F35	F35
@3.Themineyouarecurrentlywo rkinginwhatmineraldoyoumine	4	Mineral resource mined	Nominal	Input	17	Right	F8	F8
@4.Areyouawarewheneverthe miningindustrygoesthroughane conomicinst	5	Awareness of mining industry economic instability	Nominal	Input	17	Right	F3	F3
@5.Areyoutheonlybreadwinner athome	6	Only breaadwinner	Nominal	Input	11	Right	F3	F3
Yoursuperiorsprovideyouwithth etypeofinformationyoureallywa ntandn	7	EC1	Ordinal	Input	17	Right	F17	F17
Youaresatisfiedwiththeexplana ntionsyougetfromtopmanagem entaboutw	8	EC2	Ordinal	Input	17	Right	F17	F17
Youexpectthatrecommendation syoumakewillbeheardandseriou slyconsid	9	EC3	Ordinal	Input	17	Right	F17	F17
Youfeelfreetochallengeyoursup eriorwhenyoudisagreewiththem	10	EC4	Ordinal	Input	17	Right	F17	F17
Yoursuperiorlistenstoyouwheny outellhimheraboutthingsthatare bothe	11	EC5	Ordinal	Input	18	Right	F18	F18
Youfeelsafeandprotectedwheny outellyoursuperioraboutthingsth athav	12	EC6	Ordinal	Input	17	Right	F17	F17
Yougetexcitedaboutgoingtowor k	13	EE1	Ordinal	Input	17	Right	F17	F17
Wouldyourecommendyourorga nisationasagoodplacetoworkin	14	EE2	Ordinal	Input	17	Right	F17	F17

Lookingbackoverthepastyearorsoyourorganisationhasbecomeabetterpl	15	EE3	Ordinal	Input	18	Right	F18	F18
Iamwillingtotakenewtasksasrequiredbymymanager	16	EE4	Ordinal	Input	17	Right	F17	F17
Doyoutaketheinitiativetohelpyourcolleagueswiththeirworkwhenthene	17	EE5	Ordinal	Input	17	Right	F17	F17
Doesyourteamhelpyoucompleteyourwork	18	EE6	Ordinal	Input	17	Right	F17	F17
Doyousuggestsolutionstoproblemsthatariseinyourorworkspace	19	EE7	Ordinal	Input	17	Right	F17	F17
Whenyoureceivefeedbackonyourperformanceareyouabletorespondpositi	20	EE8	Nominal	Input	17	Right	F17	F17
Effective_communication	21	Effective communication	Scale	Input	25	Right	F8.2	F8.2
EffCom1	22	EffCom1	Scale	Input	10	Right	F8.2	F8.2
EffCom2	23	EffCom 2	Scale	Input	10	Right	F8.2	F8.2
EEng1	24	EEng 1	Scale	Input	10	Right	F8.2	F8.2
EEng2	25	EEng 2	Scale	Input	10	Right	F8.2	F8.2

Variables in the working file

Variable Values

Value		Label
@1.Undewrwhichjobdescription doyoufallunder	1	Shift boss
	2	Miner
	3	Mining operator
	4	Other
@2.Whatisyourhighesteducationlevel	1	Partially completed high school
	2	Mining certificate
	3	Matric graduate
	4	Diploma
	5	Degree
@3.Themineyouarecurrentlyworkinginwhatmineraldoyoumine	1	Coal
	2	Gold

Yougetexcitedaboutgoingtowor k	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree
Wouldyourecommendyourorga nisationasagoodplacetoworkin	1	Strongly disagree
	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree
Lookingbackoverthepastyearor soyourorganisationhasbecome abetterpl	1	Strongly disagree
	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree
Iamwillingtotakenewtasksasreq uiredbymymanager	1	Strongly disagree
	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree
Doyoutaketheinitiativetohelpyo urcolleagueswiththeirworkwhen thene	1	Strongly disagree
	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree
Doesyourteamhelpyoucomplet eyourwork	1	Strongly disagree
	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree
Doyousuggestsolutionstoproble msthatariseinyourorworkspace	1	Strongly disagree
	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree
Whenyoureceivefeedbackonyo urperformanceareyouabletores pondpositi	1	Strongly disagree
	2	Disagree
	3	Neutral
	4	Agree
	5	Strongly agree