



**IMPACT OF EMOTIONAL INTELLIGENCE ON SELECTED WORK-
RELATED ATTITUDES AND TASK PERFORMANCE OF
SUBORDINATE PRODUCTION FLOOR WORKERS IN THE SOUTH
AFRICAN 3D PRINTING INDUSTRY**

By

KUTLUISISO THABANG MOKOKA

Masters of Philosophy in Management Sciences
(Business Management)

In the
Faculty of Management Sciences

CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE

Supervisor: Prof. DY Dzansi
Co-supervisor: Dr TC Dzogbewu
Co-supervisor: Prof. DJ De Beer

DECLARATION

I, **Thabang Mokoka**, student number _____ declare that this research report submitted to the Central University of Technology, Free State, for the Masters Degree in Management Sciences (Business Management), is my independent work and has not previously been submitted by me to another university/faculty. I further cede the copyright of the thesis in favour of the Central University of Technology, Free State.

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ACKNOWLEDGEMENTS

- I wish to express my gratitude to the Higher Power and my Ancestors – Ba Koena ba Mokoteli le ba Koena ba Sechele, for providing me with guidance, support and protection throughout the Masters programme and completion of this dissertation.
- I would like to thank my supervisor Prof. Dennis Yao Dzansi, for affording me the opportunity to gain valuable insights in my area of study, and for offering constructive criticisms that has sharpened my ability to critically probe the subject matter. This appreciation is also extended to my co-supervisor Dr. Thywill Cephass Dzogbewu, to whom I am extremely grateful for all the encouragement and support you have provided me throughout this journey.
- To my co-supervisor Prof. Deon Johan De Beer, I wish to thank you for your enormous support throughout this dissertation and most especially, providing guidance during the data collection process that has led me to come up with new knowledge on the subject of 3D printing.
- I would not be doing justice without mentioning Prof. Alfred Ngowi, for believing in my abilities and further inspiring me to pursue this research journey in my area of 3D printing.
- I also express my gratitude to my friends, fellow scholars and colleagues, to whom there is a lot to mention, who supported me throughout this difficult yet fulfilling process of study.
- I am eternally grateful for the sacrifice my family, mother, my late father, siblings and more especially my children Lehakoe, Bohlokoka and Boikano for the missed parent time and enormous support you emotionally given me through your generous patience and understanding in order for me to get enough time to work on my dissertation.

ABSTRACT

This research aimed to expand upon management studies in the 3D printing sector, which have commonly been engineering-focused. It examined the impact of a leader's emotional intelligence and an employee's emotional intelligence on job performance and behavior in South Africa's 3D printing industry. The study used a quantitative, explanatory research design, collecting data from 154 workers via online questionnaires during the 23rd RAPDASA conference. Statistical analyses were performed using SPSS version 26 and Smart PLS 4, with structural equation modelling applied to test the study's nine hypotheses.

The research findings indicated that there was no substantial correlation between a leader's emotional intelligence and an employee's job performance. However, significant positive correlations were found between a leader's emotional intelligence and an employee's job behavior, and between an employee's emotional intelligence and job performance. Employee emotional intelligence and job behavior were found to be uncorrelated, but a strong positive relationship was found between job behavior and performance. Regarding moderating effects, the study found that an employee's job behavior positively influenced the relationship between a leader's emotional intelligence and an employee's job performance. However, an employee's emotional intelligence did not have a moderating effect on the relationships between a leader's emotional intelligence and an employee's job performance or job behavior. Moreover, an employee's emotional intelligence did not moderate the relationship between job behavior and performance.

Based on the results, the researcher recommends that 3D printing firms should prioritize emotional intelligence in their training programs and recruitment criterion.

Key words: Leader, Employee, Subordinate, 3D printing, job task performance, Emotional intelligence,

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ABBREVIATIONS AND ACRONYMS

AET	Affect Events Theory
AVE	Average Variance Extracted
ECT	Emotional Contagion Theory
EI	Emotional Intelligence
3D	Three Dimensional
EQI	Emotional Quotient Inventory
IWPQ	Individual Work Performance Questionnaire
LEI	Leader Emotional Intelligence
LMX	Leader Member Exchange
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test
PLS	Partial Least Squares
RAPDASA	Rapid Product Development Association of South Africa
SEI	Subordinate Emotional Intelligence
SEM	Structural Equation Modelling
SJRA	Subordinate Job-Related Attitude
SJTP	Subordinate Job Task Performance
SPSS	Statistical Package for Social Sciences
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

Technological development in the manufacturing sector has led to three-dimensional (3D) printing being popularly adopted in recent times (Konnikov, Konnikova, & Rodionov, 2019). 3D printing is a unique manufacturing method where 3D objects are added in succession based on a geometrical representation (Shahrubudin, Chuan & Ramlan, 2019). In different sectors such as health, aviation, agriculture, health, and automotive, 3D printing technology is used to produce and customise various designs to serve different purposes (Shahrubudin et al., 2019).

According to Armstrong (2012), employees remain the most critical assets for organisations, and therefore it remains crucial for organisations to invest in their employees through skills advancement and training. Researchers have argued that the 3D printing industry involves a lot of technicalities and complexities in its operations. So it requires a workforce that has the required knowledge and technical skills to meet the demands of 3D printing firms (De Schutter, Lesage, Mechtcherine, Nerella, Habert & Agusti-Juan, 2018). Therefore, it remains pertinent for 3D printing firms to have relevant managerial capabilities such as emotional intelligence to contribute positively to employee job task performance and job-related attitudes/behaviour such as commitment, positive attitudes, and punctuality at the workplace. Studies have found that managers who possess emotional intelligence can positively influence and support their subordinates to achieve job task performance and positive job-related attitudes/behaviour (Dartey-Baah & Mekpor, 2017; Batool, 2013; Makkar & Basu, 2017).

The study contributes to Sustainable Development Goal 8, which deals with decent work and economic growth, a key focus of South Africa as a UN member. Attaining a good understanding of leaders' and subordinates' emotional intelligence on subordinate job task performance and job-related attitudes/behaviour will be instrumental to managers of 3D printing firms in ensuring the adoption of best human resource practices towards enhancing work decency and better treatment for employees.

1.2 Problem background

3D printing technology is one of the recognised technologies expected to revolutionise different sectors and bring about significant transformation in the manufacturing industry (Rong, Patton & Chen, 2018). Due to this significance, the government of South Africa has invested heavily in the research and growth of 3D printing technology (Aghimien et al., 2020). However, the same authors observed that one of the critical problems confronting the 3D printing industry is the low number of qualified workers. Meanwhile, researchers have focused their attention on the engineering dimension of 3D printing (De Beer, 2011; De Beer & Du Perez, 2015a). Research related to managerial issues in the 3D printing environment has not gained the necessary attention despite the importance of the workforce in the growth and development of every organisation, including 3D printing firms (Alabi, 2019). According to De Beer and Du Perez (2015a), as the 3D printing industry continues to develop, researchers need to pay attention to managerial issues since employees have a critical role to play in the growth and development of the 3D printing industry.

Leaders' emotional intelligence, which is characterised by leaders' expression of compassion, respect, support, and understanding, promotes a relaxed and productive atmosphere at the workplace, which enhances employees' job task

performance and job-related attitudes/behaviour (Dartey-Baah & Mekpor, 2017; Batool, 2013; Makkar & Basu, 2017). Other studies have assessed the impact of subordinates' emotional intelligence on subordinates' job task performance and job-related attitudes/behaviour (Sambu, 2019; Akhtar et al., 2017; Moradi et al., 2012). Studies have also been conducted on the impact of subordinates' job task performance and job-related attitudes/behaviour (Khan et al., 2014; Hettiararchchi & Jayarathna, 2014). However, none of these studies was conducted within the context of the 3D printing industry in South Africa. South Africa is unique due to its apartheid past, which no other country has experienced. What has that to do with the phenomenon under investigation? A bit of context should be provided. Therefore, it is likely that South Africa could create a different contextual problem for managing the 3D printing workforce. Thus, the current study finds it appropriate to investigate the managerial aspect of the 3D printing industry in South Africa.

1.3 Problem Statement

The current state of affairs among production floor employees in 3D printing firms in South Africa highlights a need for a thorough examination of emotional intelligence's impact on job task performance and job-related attitudes. As the 3D printing industry evolves, the dynamics on the production floor become increasingly critical. In the absence of a comprehensive understanding of the relationships between leaders' and subordinates' emotional intelligence, subordinates' job task performance, and job-related attitudes, the 3D printing firms could face challenges such as decreased productivity, strained interpersonal relationships, and heightened job dissatisfaction among employees. Failure to address these issues may result in a negative ripple effect, potentially leading to higher turnover rates, lower morale, and compromised product quality.

Hence, by not proactively investigating and managing the interplay of emotional intelligence among leaders and subordinates, the 3D printing firms risk hindering their potential for innovation and success. This study, therefore, seeks to uncover insights that can inform interventions and strategies, ensuring a positive and productive work environment for production floor workers in 3D printing firms in South Africa. Addressing these issues is crucial for the long-term sustainability and success of the 3D printing industry in the region.

1.4 Aim of the study

This study aims to contribute to managerial research and practice in the 3D printing industry since research in the 3D printing industry has primarily focused on engineering. Please check the aim you stated in the PS and this one here. I suppose the aim should be consistent throughout the study.

1.5 Research objectives

The research objectives are as follows.

1.5.1 Main Objective

The primary objective was to ascertain how a leader's emotional intelligence affects the emotional intelligence, attitudes, and task performance of subordinates within the 3D printing sector.

1.5.2 Subsidiary objectives

1. To determine the impact of leader emotional intelligence on subordinate's task performance, job-related attitude, and emotional intelligence.
2. To determine the impact of subordinate emotional intelligence on their task performance and job-related attitude.
3. To determine the impact of subordinate job-related attitudes/behaviour and subordinate job task performance.
4. To develop a structural model linking the above variables.

1.6 Hypotheses

This section of the study presents the main and subsidiary hypotheses of the study.

1.6.1 Main hypothesis

A leader's emotional intelligence will, directly and indirectly, influence subordinate emotional intelligence, attitudes and task performance in the 3D printing environment.

1.6.2 Subsidiary Hypotheses

- H1: A positive correlation exists between a leader's emotional intelligence and an employee's job task performance.
- H2: A positive link exists between a leader's emotional intelligence and an employee's work-related behaviors.
- H3: A positive relationship exists between an employee's emotional intelligence and their task performance.

- H4: A positive relationship exists between an employee's emotional intelligence and their work-related behavior.
- H5: A positive correlation exists between an employee's work-related attitudes and their job task performance.
- H6: An employee's work-related behaviors moderates the relationship between a leader's emotional intelligence and the employee's job task performance.
- H7: An employee's emotional intelligence moderates the relationship between a leader's emotional intelligence and the employee's job task performance.
- H8: The emotional intelligence of employees moderate the relationship between the leader's emotional intelligence and the employees' work related behaviour.
- H9: An employee's emotional intelligence moderates the link between the employee's job performance and their work-related behavior.

1.7 Overview of Methodology

This study adhered to the positivist research paradigm, which emphasizes objectivity in comprehending reality (Densin & Lincoln, 2018). The explanatory research design was used for the explanation of relationships between emotional intelligence of leaders, emotional intelligence of subordinates and job performance of employees in 3D printing firms in South Africa.

A quantitative research approach was adopted, employing numerical data to test hypotheses and establish relationships among the investigated constructs. The population of interest consisted of employees from 3D printing firms who participated in the 23rd Annual RAPDASA Conference in South Africa. Utilizing the simple random sampling technique, the researcher used one hundred and fifty four (154) employees of 3D printing firms in South Africa, from a population of two hundred and seventy-five (275). Questionnaires served as the primary data

collection instruments. For leaders and subordinates' emotional intelligence, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) was used. Subordinates' job task performance was measured using the Individual Work Performance Questionnaire (IWPQ) which was developed by Koopmans, Bernaards, Hilderbrandt, Van Buuren, Van Der Beek and De Vet (2013). Employee job-related attitude/behaviour such as vigor, dedication, absorption was measured using Utrecht Work Engagement Questionnaire. The collected questionnaire data underwent analysis employing Statistical Package for Social Sciences (SPSS) version 26 and Smart PLS 4 software. Partial Least Squares (PLS) Structural Equation Modeling was employed to evaluate both the direct and moderating effects among the variables considered in the study.

1.8 Significance of the Study

The significance of this study is found in the contributions made in terms of research and policy.

From a research domain, this study has achieved its aim of contributing to managerial research in the 3D printing industry in South Africa, as most studies have focused on the engineering and technical aspect of 3D printing. Based on the results of the study, it could be rightly inferred that, the relationships between leader emotional intelligence, subordinate emotional intelligence, subordinate job task performance and subordinate job behavior have been examined. Since five of the hypotheses were not supported, the findings of the study paves the way for more research to be conducted on the subject matter, thereby widening the scope of emotional intelligence research in 3D printing within the South African context. It is therefore important for future researchers to use this study as a good reference point to further explore other variables that affect the connections between leader

emotional intelligence, subordinate emotional intelligence, subordinate job task performance and subordinate job behavior.

In terms of policy, the finding of this study, its conclusions and recommendation have implications for policy on managerial issues in the 3D printing sector in South Africa. In this regard, the need for both employee and subordinate training on emotional intelligence has become a critical variable that needs the attention of stakeholders as well as policy makers within the context of 3D printing sector in South Africa. This is because, both leader and subordinate emotional intelligence have implications on employee outcomes such as employee job behavior and employee job task performance.

1.9 Limitations of the study

This study faced certain limitations due to the narrow scope of focusing on 3D printing firms within South Africa. Given the relatively small size of the 3D printing industry in South Africa compared to the international 3D printing industry, data collection from employees of 3D printing firms posed a significant challenge. Nonetheless, through effective collaboration with colleagues who attended the RAPDASA conference in November 2022, emails of attendees were obtained and utilized in the data collection process.

Additionally, the data collection process encountered delays during the initial stages. The online questionnaire, which was emailed to participants of the RAPDASA conference, initially did not achieve the expected response rate. However, follow-up phone calls were made to respondents, resulting in an acceptable response rate.

It is important to note that these limitations did not invalidate the findings of the study, but instead, they provide opportunities for future research to expand on the study's scope and investigate the generalizability of its findings beyond the 3D printing firms in South Africa.

1.10 Structure/ organization of the study

This dissertation is organized into six sections. The initial chapter provides an introduction, background of the problem, statement of the problem, purpose of the research, objectives, research questions, hypotheses, a brief overview of the research method, the study's significance, its limitations, and the thesis's structure. The second chapter comprises a review of relevant literature. The third chapter elaborates on the theoretical literature, the conceptual framework, and the development of hypotheses. The fourth chapter details the research methodology used, while the fifth chapter outlines the study's findings and ensuing discussions. Finally, the sixth chapter delivers the conclusions drawn from the study and associated recommendations.

1.11 Chapter Summary

The aim of this study was to enrich the understanding of managerial research within South Africa's 3D printing industry, specifically by investigating the influence of emotional intelligence on work-related attitudes and job task performance of workers on 3D printing production floors. The study employed PLS structural equation modeling to verify eleven hypotheses. This initial chapter offered a summary of the study's introduction, the background, the problem under investigation, the study's objectives, research questions, methodology, significance, constraints, and overall structure.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter conducts a literature review on the concepts employee task performance, job attitudes, emotional intelligence, and behavior. Emotional intelligence profoundly influences task performance and job-related attitudes/behaviour by fostering effective communication, collaboration, and adaptability (Thomas & Kamalanbhan, 2012). Individuals with high emotional intelligence navigate workplace challenges with empathy and self-awareness, mitigating conflicts and enhancing teamwork (Nguyen et al., 2019). This emotional acumen also positively shapes job-related attitudes/behaviour, cultivating a resilient and positive work environment (Naidoo, 2016). Employee attitudes and behaviour involve employee commitment, engagement, job satisfaction, motivation, absenteeism and tardiness (Dey, 2012; Bakker & Leiter, 2010; Kim et al., 2019; Jensen, 2018; Kehinde, 2011; Ketchum, 2016) and are affected by various factors such as employee values, self-efficacy, stress and managerial trust (Alas et al., 2013; Puente-Diaz, 2016; Iskamto, 2021; Ugboro, 2016). These attitudes and behaviours can have an impact on task performance as examined by Bahl (2016) who found that a significant positive relationship exist between job related attitudes and behaviour and employee task performance. Therefore, it becomes apparent that emotional intelligence is an integral part of an organization.

2.2 Employee task performance

This section presents literature on employee task performance. The section commences with definitions on task and task performance and their contextualization to the 3D printing industry in South Africa. The section also presented literature on the determinants and implications of employee task performance.

2.2.1 Defining task

A task is defined as an activity that is performed within a defined period of time and is intended to achieve a specific goal (Zheng, Diaz, Jing & Chiaburu, 2015). Similarly, Singh (2019) defines a task as a single work activity that has a specific goal and requires the expenditure of effort and time to complete. Moreover, Kim, Wang and Chen (2018) define a task as a unit of work that requires effort to be expended by a person or teams in order to achieve the goal of a firm.

From the definitions, it could be rightly deduced that all the three definitions share the common theme of a specific goal or outcome that requires effort and time to achieve. However, there are some differences in emphasis. The first definition emphasizes the importance of time (Zheng et al., 2015), while the second definition emphasizes the idea of a single work activity (Singh, 2019). However, the third definition emphasizes the idea of a unit of work that can be completed by an individual or a team (Kim et al., 2018).

This study defines a task as a specific unit of work with a defined goal that requires effort and resources to complete within a given timeframe. If it is the operational definition you have to state that categorically please. In the 3D printing work environment, production floor workers perform different tasks, which include

preparing the 3D printing equipment before a job, such as loading materials and checking settings; starting and monitoring the 3D printing process; and finishing and post-processing 3D prints, such as cleaning, sanding, and painting them. Workers on the 3D printing production floor are also involved in inspecting the finished products for quality control as well as identifying any defects or issues that need to be resolved.

2.2.2 Explaining employee task performance

Employee task performance is defined by Yang and Wei (2017) as a set of work-related behaviors that employees engage in to meet the requirements of their job. Krishnan, Loon and Tan (2018) also define employee task performance as the extent to which an employee executes the activities required by their job to achieve organizational goals. Hassan, Wright and Park (2016) define employee task performance as the extent to which staff of organizations are able to carry out their job duties effectively. Based on the definitions, it could be deduced that all three definitions place emphasis on the fact that employee task performance is a set of behaviors or activities that are required by the job and contribute to organizational goals. However, there are some differences in emphasis. This study, however, defines employee task performance as the extent to which an employee completes their job duties effectively and efficiently in order to contribute towards the attainment of firm objectives. In the 3D printing sector, task performance among production floor workers comprises the following: meeting production targets by completing a certain number of 3D prints per shift; maintaining quality standards by inspecting finished products for defects; and reworking or rejecting any that do not meet standards.

2.2.3 Determinants of employee job task performance

In this section, the presents literature on the determinants of employee job task performance across three different dimensions namely firm related factors, employee related factors and job related factors.

2.2.3.1 Firm related factors

This section presents literature on firm related factors as determinants of employee task performance which comprised of managerial support, organisational climate and also training and development for employees.

2.2.3.1.1 Managerial Support

There is a substantial body of evidence indicating that managerial support is essential for the enhancement of employee task performance (Armstrong, 2012). Kumar, Jauhari, Rasogi and Sivakumar (2018) found that employees are more likely to do well on the job if they perceive that management acknowledges and appreciates the efforts they make in relation to their jobs. There is research suggesting that having support from management is associated with higher levels of devotion and initiative, which enhance employee task performance (Kumar et al., 2018; Kravarithi, Tasoulis, Scullion and Alali, 2022).

From the literature, the study argues that managerial support can/will be (as you are now going to check/determine that in this industry) critical for enhancing the task performance of employees in the 3D printing sector in South Africa. When managers show appreciation and acknowledgement for employees' efforts in their jobs, employees are more likely to perform well. This is particularly relevant for

production floor workers, who are responsible for executing and managing the 3D printing process.

By providing support and recognition, managers can foster a sense of devotion and initiative among production floor workers. This can lead to better task performance in terms of meeting production targets, maintaining quality standards, following safety protocols, collaborating with colleagues, and participating in training and development activities. Furthermore, support from managers can help create a positive work environment, which can improve job satisfaction and motivation among production floor workers.

2.2.3.1.2 Organisational climate

According to Sethibe (2018), the climate of an organization affects the attitudes and behaviors of its workers, which in turn affects their task performance levels. Sethibe (2018) further found a link between organizational climate and employee adaptability and attitudes towards task performance. In this regard, as employees perceive their organisational climate to be positive, it could lead to a positive attitude towards the performance of tasks assigned to them and vice versa (Riad, Labib and Nawar, 2016). In another study, Rozman and Strukelj (2021) also found that the organisational climate of an organisation has implications for employees' task performance.

From the literature, it is argued that organizational climate can have a significant impact on the task performance of production floor workers in the 3D printing sector in South Africa. For production floor workers in the 3D printing sector, a positive organizational climate can manifest in several ways. For example, if the organization fosters a culture of collaboration and teamwork, production floor workers may be more likely to work effectively together, leading to improved task

performance. Additionally, if the organization provides clear expectations and support for employees, this can help to create a sense of purpose and motivation among production floor workers, which can lead to better task performance. On the other hand, a negative organizational climate can have the opposite effect, leading to lower levels of task performance among production floor workers. This can be caused by factors such as poor communication, a lack of support or recognition, or a lack of clarity around job expectations.

2.2.3.1.3 Training and development

According to Ganesh and Indradevi (2015), employee task performance can be improved through training and development because it enables individuals to acquire new skills and information. Additional research demonstrates that training and development improve an individual's knowledge and skills, enabling them to better deal with new challenges on the job and, as a result, increasing their productivity. Nwaeke and Obiekwe (2017) identified a correlation between training and employee task performance. Larsen (2017) discovered that companies' training practices are linked to staff growth in their job roles, which enhances their task performance.

Based on this literature, the study argues that training and development can play a crucial role in enhancing the task performance of production floor workers in the 3D printing sector in South Africa. Through training and development initiatives, employees can acquire new knowledge and skills that can help them deal with new challenges in their job and ultimately improve their productivity and task performance levels. Regarding production floor workers in the 3D printing sector, training and development can take several forms. This could include technical training on the use of new equipment or software, as well as training on workplace safety, quality control, and other relevant topics. By providing employees with

access to these types of training and development opportunities, organizations can equip their workers with the skills and knowledge needed to perform their job duties effectively and efficiently.

2.2.3.2 Employee-related factors

This section presents literature on employee related factors as determinants of employee task performance. Employee related factors discussed comprised skill flexibility and motivation.

2.2.3.2.1 Skill flexibility

In their definition of employees' skill flexibility, Sekhar, Patwardhan and Vyas (2016) use phrases like "the number of possible alternative ways through which employees can apply their skills in their job" and "how employees with different skills can be repositioned to the proper places to work efficiently". According to Sabuhari, Sudiro, Irawanto and Rahayu (2020), a company's ability to expand the skill flexibility of its employees can be helped by using a number of techniques, which comprise rotation of jobs as well as cross-functional teams. These strategies can be utilized by the organization to produce one-of-a-kind talent sets that are difficult for its competitors to imitate (Pradhan, Kumari & Kumar, 2017). A higher degree of skill flexibility indicates that employees have a greater likelihood of demonstrating higher levels of performance. This is due to the fact that the impact that skill flexibility has on employee task performance is the most significant (Maley, 2019).

Within the context of the 3D printing sector, therefore, skill flexibility can enhance employee task performance in a positive manner by making employees develop multiple skills over time. For instance, through job rotation, a 3D printing CAD designer could also have the opportunity to develop skills in the polishing and

calibration of machines, and vice versa. In this regard, multiple skill sets will be achieved as employees become more versatile in performing various tasks towards the achievement of organisational goals.

2.2.3.2.2 Motivation

Sandh, Iqbal, Ali and Tufali (2017) discovered that the motivation of workers is connected to and ultimately determines employee task performance. According to Mikkelsen, Jacobsen and Andersen (2017), who contend that as businesses improve employee motivation, it leads to an increase in task performance as employees develop positive attitudes about their work and tend to give off their best, From the perspective of Mikkelsen et al. (2017), employee motivation could take different forms, ranging from promotions, bonuses, appreciation for good work done, and creating an enabling environment for employees, among others (Kalogiannidis, 2021).

From the literature, the study contends that creating an environment that fosters motivation can be essential in the context of production floor workers in the 3D printing sector in South Africa. 3D printing firms could therefore incentivize production floor workers by offering rewards and recognition programs for excellent performance, such as bonuses, promotions, or other forms of compensation. Furthermore, employers have the ability to establish a work environment that fosters employee motivation by granting production floor workers access to the necessary resources that enable them to carry out their job responsibilities with optimal effectiveness and efficiency. This may entail furnishing personnel with the requisite tools and instructions to execute their duties optimally. As advised above.

2.2.3.3 Job-related factors

This section presents literature on job related factors as determinants of employee task performance. Job related factors discussed comprised job autonomy, working conditions and communication.

2.2.3.3.1 Job autonomy

According to Saragih (2015), job autonomy is the degree of control and independence that employees have in making decisions about how they carry out the tasks assigned to them. High job autonomy is associated with enhanced levels of employee task performance due to the increased freedom it provides workers in selecting the most efficient approach to fulfilling their responsibilities. This, in turn, fosters greater workplace flexibility (Preenen, Oeij, Dhondt, Kraan & Jansen, 2016). As shown by Clausen, Pedersen, Andersen, Theorell and Madsen (2022), there is a significant positive relationship between job autonomy and employee task performance.

Job autonomy can be particularly relevant for production floor workers in the 3D printing sector in South Africa. Employees who are granted autonomy in task execution, such as the ability to choose their preferred machinery or customise the settings on a 3D printer, may enhance their productivity and performance. This has the potential to enhance job performance and productivity while reducing errors and rework. Employees ought to be granted a certain level of autonomy in their tasks while also being equipped with adequate instruction and guidelines to ensure that they can perform their duties in a secure and effective manner without jeopardising the standard of their work.

2.2.3.3.2 Working conditions

The working conditions of employees have an effect on their levels of productivity and performance. In addition, Schaufel (2017) asserts that the capacity of workers to be proactive in task performance is impacted by the nature of the work environment in which they are engaged. A positive working environment could be characterised by good occupational health and safety standards, managerial support, effective supervision and feedback, good wages and salaries as well as bonuses, good leadership, and opportunities for innovation and teamwork, among others (Brunner, Igic, Keller and Wieser, 2019).

In the 3D printing production sector in South Africa, it is essential for managers and employers to understand the impact of a positive job environment and its influence on the task performance of employees. Workers in this sector are required to operate sophisticated machinery and technology, which makes their working conditions critical to their job performance and overall well-being.

Ensuring a safe and well-ventilated work environment is crucial for protecting employees from physical hazards and maintaining good health. In addition, appropriate lighting is necessary for effective task performance and preventing eye strain and fatigue. Providing regular feedback and opportunities for skill development and training could boost employees' morale and confidence in their abilities to perform their tasks efficiently and effectively.

2.2.3.3.3 Communication

According to Smith, Patmos and Pitts (2018), effective communication in the workplace is considered a key factor that contributes positively to the firm's success. According to Armstrong (2012), a direct correlation can be seen between

an employee's level of overall performance and their capacity for successful communication in the workplace. This is because communication between managers and their subordinates helps to provide prompt feedback to employees regarding how effectively they have performed tasks assigned to them (De Wet and Koekemoer, 2016). Prompt feedback through effective communication is instrumental in helping employees improve their task performance in the organisation (Ammari, Alkurdi, Alshurideh & Alrowwad, 2017).

In the context of 3D printing production floor workers in South Africa, effective communication could involve providing clear and concise instructions for tasks, opening channels of communication between managers and employees, and providing opportunities for feedback and dialogue. For example, managers could schedule regular meetings with their employees to discuss their progress and provide feedback on their performance. Additionally, they could encourage employees to voice their concerns or ideas for improving the production process. By fostering an environment of open communication, managers can ensure that employees feel heard and valued, which can contribute to higher levels of motivation and task performance.

2.2.4 Implications of employee task performance

Employee task performance has various implications organisations across the board. This is because effective task performance on the part of employees in organisations has positive implications for their work output in terms of enhanced productivity levels (Obuobisa-Darko, 2020). It must be noted that enhanced productivity as a result of improved task performance transcends into positive organisational outcomes such as improvements in profitability, achievement of organisational goals in real time, and overall firm performance.

From the perspective of Pang and Ruch (2019), due to the positive implications that employee task performance has on organisational outcomes, it remains pertinent for management to provide the right mechanisms to ensure that employee task performance meets the specifications and requirements of the organisation (Diamantidis & Chatzoglou, 2018). According to Sykes (2015), staff's ability to efficiently perform tasks in their firms requires efforts from managers to provide support for them in whichever way possible. Managerial support can come in different forms, such as providing employees with the right information about the tasks assigned to them, motivating employees to give their best in the performance of their tasks, and providing bonus structures or systems for employees when they achieve task targets, among others.

In the context of 3D printing production floor workers in South Africa, effective employee task performance has significant implications for the success of the organisation. A positive work environment, adequate training, and support for innovation and teamwork are some factors that can contribute to improved task performance among employees. Furthermore, effective communication between managers and subordinates is also important for providing feedback and ensuring that tasks are carried out efficiently.

To ensure that 3D printing production floor workers in South Africa perform their tasks efficiently, it is crucial for managers to provide support and motivation for employees. This could involve providing adequate training and opportunities for skill development, creating a safe and positive work environment, and offering bonuses and rewards for achieving task targets. In addition, managers should ensure effective communication channels are in place to provide prompt feedback to employees about their task performance.

Enhanced task performance among 3D printing production floor workers in South Africa could lead to improvements in the productivity levels of the organisation,

which could translate into positive outcomes such as increased profitability and overall firm performance. It is, therefore, essential for management to provide the right mechanisms to ensure that employees' task performance meets the specifications and requirements of the organisation.

2.3 Employee related attitude

In this section, attention is drawn to unravelling the complex issue of employee attitude.

2.3.1 Defining attitude

According to King, Murillo and Lee (2017), attitude is defined as a mental state of readiness that influences an individual's response to objects, people, and events in their environment. Martin and Billy (2015) also define attitude as a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to an object or an issue. However, Rawat, Khugshall and Chaubey (2015) define attitude as a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor.

The definitions above all share the idea that attitude involves an individual's psychological response to a specific object or situation. That notwithstanding, there are differences in the definitions in terms of how they place emphasis on the cognitive, affective, and neural components of attitude. While King et al. (2017) focused more on the neural and mental readiness of an individual, To et al. (2015) stressed learned predisposition, and Rawat et al. (2015) emphasised the evaluative nature of attitude.

This study defines attitude as a learned and relatively stable psychological tendency to respond with some degree of favor or disfavor to a specific object or situation. In the context of 3D printing production floor workers in South Africa, attitude could refer to workers' predispositions to respond favorably or unfavorably to the work environment, job tasks, and management. A positive attitude towards work and the work environment could result in higher motivation, improved job satisfaction, and better task performance. On the other hand, a negative attitude could result in low motivation, job dissatisfaction, and poor task performance.

2.3.2 Explaining employee job-related attitudes/behaviour

This section presents literature on employee job related attitudes/behaviour which included employee commitment, employee engagement, job satisfaction, motivation, absenteeism and tardiness.

2.3.2.1 Employee commitment as a positive employee attitude

According to Dey (2012), employee commitment is characterised by the extent to which an individual experiences a sense of allegiance to the organization in which they are employed. In order for an employee to exhibit a strong sense of loyalty towards their employer, it is imperative that the employee have established a personal connection with the organization. Based on the definition, an individual's commitment to the organization is a self-motivated action carried out to endorse the objectives of the organization.

Kodikal and Rahiman (2017) assert that there are several ways to enhance employee commitment, and these include rewarding and recognizing your employees, providing them with career growth opportunities, making sure they feel valued and respected, giving them responsibility, and ensuring they have a safe

and healthy working environment. As stated by Ariani (2014), an employee's loyalty to the organization he works for can only be achieved if he or she can identify with the organization's values and goals. It has also been noted that organizational values can influence employee commitment. According to Ramay (2012), the relationship between employee commitment and job security, followed by the atmosphere in the workplace, is significant. Linking the literature to the study, the study argues that providing a conducive working atmosphere for subordinate production floor workers in the 3D printing industry in South Africa is critical for promoting employee commitment as a positive attitude. Issues about employee remuneration, employees' work environment, and career opportunities could intensify employee commitment among production floor workers. It must also be emphasised that employee commitment has positive implications for job performance because highly committed employees give off their best when performing tasks assigned to them at the workplace.

2.3.2.2 Employee engagement as a positive employee attitude

The concept of employee engagement refers to the active participation of employees in their organisations, where they have a strong sense of purpose and find satisfaction in their work (Demerouti, Cropanzano, Bakker & Leiter, 2010). Contemporary enterprises necessitate personnel who exhibit eagerness towards their job, display proactivity, and maintain a constructive demeanor towards their clients (Mauno et al., 2007). For an employee to exhibit engagement in their workplace, they must possess the willingness and capability to exceed the expectations outlined in their job description. As per the research conducted by Laschinger et al. (2006), it has been found that employees who are engaged exhibit greater levels of job involvement and satisfaction. Additionally, they are more proficient in accomplishing their assigned tasks to the satisfaction of their supervisors and managers. Research has indicated that employees who actively

participate in goal-setting and decision-making processes exhibit a favorable influence on their job performance.

Several strategies can be implemented to foster employee engagement among 3D printing production floor workers in South Africa. Firstly, managers of 3D printing firms could involve employees in decision-making regarding their job responsibilities. This may entail requesting their input on product design, process and procedure development, and gathering their feedback on enhancing the production process. Employee engagement can enhance the sense of value and commitment to work among employees.

2.3.2.3 Job satisfaction as a positive employee attitude

In order for a worker to feel a sense of accomplishment, Kim, Kim and Han (2019) assert that he or she must be involved in the work and receive adequate compensation for their efforts, which results in job satisfaction. Kim et al. (2019) have established a correlation between job satisfaction and employee engagement. They have explained that employees who exhibit a higher level of job satisfaction tend to value their position and take pride in their organization, which ultimately leads to a greater likelihood of job engagement. In this context, engagement is regarded as the ultimate deliverable, substantiation, and consequence of job contentment.

According to Lewis (2023), a disengaged employee is an individual who lacks motivation and enthusiasm to contribute to the company's success due to their dissatisfaction with their work. According to Laschinger et al. (2006), scholars have posited that job dissatisfaction among employees can result in elevated levels of employee burnout and turnover.

Furthermore, based on the research conducted by Pillarisetty et al. (2018), the discontentment of employees can be attributed to their inability to derive significance from their job. The primary obligation of an organization is to furnish its employees with the necessary resources and tools to effectively execute their responsibilities.

The importance of employee engagement and job satisfaction is crucial in the context of 3D printing production floor workers in South Africa. Given the high demand for skilled workers in the 3D printing industry, it is important for organizations to ensure that their employees are engaged and satisfied with their work. This can be achieved by providing adequate compensation, opportunities for growth and development, involvement in decision-making processes, and creating a positive work environment. Engaged employees are more likely to be motivated, productive, and committed to achieving the goals of the organization, leading to increased efficiency and profitability. Conversely, disengaged employees can lead to high turnover rates, decreased productivity, and negative impacts on the overall success of the organization. Hence, it is imperative for organisations to give precedence to employee engagement and job satisfaction to allure and retain proficient 3D printing production floor workers in South Africa.

2.3.2.4 Employee motivation as a positive work attitude

Motivation drives employees towards their primary goal (Hanaysha & Majid, 2018). As a catalyst for all employees working for a company to improve their working performance or complete tasks better than they usually do, motivation is directly linked to individual performance and boosts organizational performance (Jensen, 2018). An organization is only as strong as the people who work for it, and each employee contributes to the organisation's ultimate goal (Jensen, 2018). At a time

when financial rewards are kept to a minimum, Reizer et al. (2019) found that factors influencing employee motivation lead to employee performance.

Within the context of 3D printing firms, employee motivation could be a strategic tool for achieving positive work attitudes. This is because a motivated employee workforce in production floor units of 3D printing firms will contribute positively to organisational productivity and profitability. In this regard, 3D printing firms cannot achieve optimum performance through their workforce if less attention is paid to employee motivation programs and strategies. It is important for 3D printing firms to conduct employee motivation surveys to identify what will really motivate their workforce to work better in their organisations. Outcomes of motivation surveys could enable 3D printing firms to design motivational programs and strategies that meet the motivational needs and expectations of their workforce, and this will translate into increased job performance.

2.3.2.5 Absenteeism as a negative employee attitude

Absenteeism is well understood by businesses and policymakers alike. The indirect and direct effects of employee absenteeism are both common, and the problem is widespread. For example, both direct and indirect absenteeism can raise costs for organizations. There are a number of factors that can lead to employee absenteeism at the workplace, many of which are related to employee dissatisfaction. Extrinsic sources of job satisfaction, such as pay, promotion, work interest, supervision, coworkers, working conditions, and the fairness of supervisors, have been identified as significant factors impacting absenteeism (Kehinde, 2011). The practice of having other employees cover for absent colleagues may have an adverse impact on employee morale. Customers may be dissatisfied if the organization's output is reduced due to their absence (Leaker, 2008).

Based on the literature, the researcher argues that employee absenteeism should not be encouraged within the confines of production floor employees in the 3D printing industry due to the negative implications that it has on employee job outcomes. 3D printing firms must develop organisational cultures and climates that debunk employee absenteeism by putting in place strict organisational policies against employee absenteeism. This will help to promote employee punctuality and hence positively impact employee outcomes such as job performance.

2.3.2.6 Tardiness as a negative employee attitude

Employees who arrive late to work experience increased levels of stress (Merritt et al., 2019). When people are under a lot of pressure, their work suffers. According to Kwon and Raman (2023), employees who are prone to showing up late for work are also at risk of having their time tainted. Carpenter and Berry (2017) stated that tardy employees' behavior may be interpreted as a lack of respect for the organization's values and as an act of negligence. According to a study by Kieslowski (2000), employees who regularly arrive late to work disrupt their work and become problematic, frequently causing financial losses for their employers. If an employee is frequently late to work, he or she is more likely to lose their position.

The implications of employees arriving late to work for 3D production floor workers in South Africa could be significant. If workers are frequently arriving late, it could lead to a decline in productivity, and the quality of their work may suffer. In addition, if employees experience high stress levels as a result of being late to work, it could impact their overall health and well-being, which could further decrease productivity.

Moreover, in South Africa, where the unemployment rate is high, being consistently late to work could put the employee at risk of losing their job. As Bolin and Heathley (2001) pointed out, tardiness could be seen as a lack of respect for the organization's values and could be interpreted as negligence, which may result in the termination of the employee's position. This could be particularly devastating in a country where many workers rely heavily on their income to support themselves and their families.

To mitigate these implications, it is important for 3D production floor workers to prioritize punctuality. Employers may need to provide additional training or support to help workers manage their time effectively and avoid being late to work. Employers could also consider implementing policies and procedures that encourage punctuality, such as flexible work schedules or a system of rewards for employees who arrive on time consistently.

2.3.3 Determinants of employee job-related attitude/behaviour

In this section, the study presents literature on the determinants of employee job-related attitude. The determinants of employee job-related attitudes/behaviour comprised employee values, self-efficacy, employee stress and managerial trust.

2.3.3.1 Employee values

According to the findings of a study that was carried out on 1,267 hotel workers in Turkey by Alas et al. (2013), employee attitudes toward organizational transformation were positively affected by work-related values. According to Alas et al. (2013), values related to professionalism are the best indicators of employee attitudes toward employee task performance. In this regard, the kind of values that employees have developed in the organisation have implications for their attitude

towards the performance of tasks assigned to them. It remains important for organisations to ensure that they imbibe in their employees' professional values related to their work and tasks assigned to them, which positively influence their task performance.

The findings of the study by Alas et al. (2013) are also relevant to 3D printing production floor workers in South Africa. The development of work-related values in these workers can have a significant impact on their attitudes towards organizational transformation and their performance of tasks assigned to them. If organizations in the 3D printing industry in South Africa prioritize the development of professional values in their employees, such as a commitment to quality, attention to detail, and a strong work ethic, it is likely that their employees will be more engaged in the transformation of the organization and will perform their tasks more effectively and efficiently. In addition, these values may also positively influence employee job satisfaction and overall organizational performance. Therefore, it is essential for organizations to ensure that their employees are trained and motivated to develop professional values that can contribute to the success of the organization.

2.3.3.2 Employee self-efficacy

Another factor associated with employee-related attitudes is employee self-efficacy. An employee's sense of self-efficacy, which depicts their awareness of potential risks, plays a role in their perspectives towards employee-related attitudes (Puente-Diaz, 2016). A person's conviction in their own capacity was found to be the single most crucial factor in determining whether or not they will maintain positive attitudes in the organisation amidst changing trends in working conditions (Iroegbu, 2015; Cetin & Askun, 2018).

The concept of self-efficacy can be relevant to 3D printing production floor workers in South Africa, as it can influence their attitudes and performance in the workplace. For instance, if workers have a high level of self-efficacy, they may be more confident in their ability to perform their tasks and adapt to new technologies and work processes. This can lead to increased job satisfaction, engagement, and productivity. On the other hand, workers with low self-efficacy may struggle to adapt to new technologies and work processes, leading to frustration, stress, and reduced job performance. Therefore, it is essential for organizations to develop training programs and provide support to enhance the self-efficacy of their workers in order to improve their attitudes towards their work and, ultimately, their performance.

2.3.3.3 Employee Stress

Employee stress is another factor that could also affect employee attitudes towards their organisations. According to Richardson (2017), when employees are exposed to high stress levels, which could be linked to work overload, it has negative implications for their work attitudes in their organisations. However, minimal exposure to employee stress could enable employees to adjust in their organisations and hence develop positive work attitudes towards their work (Holton, Barry & Channey, 2016; Iskanto, 2021).

In the context of 3D printing production floor workers in South Africa, it is important for employers to take into account the potential impact of employee stress on their attitudes towards the organization. This is particularly relevant given the fast-paced and demanding nature of 3D printing production work, which can often result in high levels of stress among workers. Employers should therefore implement measures to mitigate stress and promote employee well-being, such as providing regular breaks, offering mental health support, and ensuring the workload is manageable. By doing so, employers can help ensure that their workers maintain positive

attitudes towards their work and the organization, which in turn can lead to increased productivity and job satisfaction.

2.3.3.4 Managerial trust

Managerial trust is another factor that has implications for employee attitudes towards the performance of tasks. According to Ugboro (2016), employees who trust their managers tend to have positive attitudes towards the performance of tasks assigned to them. On the other hand, when there is mistrust between employees and their managers, it leads to the development of negative attitudes towards task performance. Nienabar, Romeike, Searle and Schewe (2015) argue that employees having trust in their managers boosts their confidence to give their best in the organisation, knowing that their managers are always there to support them when they need help.

In the context of 3D printing production floor workers in South Africa, managerial trust is a crucial factor that can affect their attitudes towards the performance of tasks. When 3D printing production floor workers trust their managers, they are more likely to have positive attitudes towards the tasks assigned to them, which can enhance their overall work performance. On the other hand, when there is a lack of trust between employees and their managers, it can lead to the development of negative attitudes towards task performance, which could lead to a decline in overall work performance. Therefore, 3D printing firms in South Africa should focus on building and maintaining trust between managers and employees to enhance the development of positive work attitudes among their production floor workers. This can be achieved through effective communication, transparent decision-making, and providing opportunities for feedback and collaboration.

2.3.4 Implications of employee job-related attitude

Employee job-related attitudes/behaviour have various implications at the workplace in which they work. Positive attitudes developed by employees at the workplace have various positive implications. According to Judge, Weiss, Kammeyer-Mueller and Hulin (2016), employees with positive work attitudes do display voluntary work behaviors such as providing support for their co-workers and also helping out with tasks that they are not even being assigned to.

A positive job-related attitude also affects employee output regarding tasks assigned to them, as it enhances employee productivity. Employees with positive job attitudes are always willing to help in every situation in the organisation as they find it an obligation to always ensure that firm goals are attained (Wong & Law, 2017). It is also important to note that employees with positive work attitudes are very engaged with their work and would not complain even if they had to work extra hours to make sure that the efficiency of work output was attained (Miao, Humphrey & Qian, 2017). There is a high level of intrinsic motivation for employees with positive work attitudes, as they are motivated internally to give their best so that the organisation they work for can achieve good results.

In the context of 3D printing production floor workers in South Africa, positive job-related attitudes/behaviour could have significant implications for the productivity and performance of the workers. Employees with positive work attitudes are likely to exhibit voluntary work behavior and support their co-workers, which could lead to improved teamwork and collaboration within the workplace. This is particularly important in 3D printing production, where precision and attention to detail are crucial and team effort is often required to ensure that production targets are met.

Furthermore, positive job-related attitudes/behaviour among 3D printing production floor workers could enhance their productivity and efficiency in carrying out their

tasks. As these workers are often required to handle complex and technical tasks, a positive attitude towards their work could lead to a higher level of engagement and motivation, resulting in higher-quality output and fewer errors. Additionally, a positive attitude towards work could lead to employees being more willing to work extra hours or take on additional responsibilities if necessary, which could be essential in meeting tight production deadlines.

Employees with negative attitudes towards work, on the other hand, become a liability to the organisation instead of an asset. While positive attitudes of employees motivate them to be punctual at work and on time, employees with negative attitudes towards work dampen productivity with lateness to work and a lack of punctuality (Landis, Vick & Novo, 2015). Employees with negative attitudes are also found to exhibit presenteeism, which means that they come to work alright but do not give their best, resulting in low work productivity (Lohaus & Habermann, 2019).

In the context of 3D printing production floor workers in South Africa, negative job-related attitudes/behaviour can also have a negative impact on the productivity and overall success of the organization. Employees with negative attitudes may not be motivated to arrive on time and may not take their work seriously, leading to decreased efficiency and effectiveness on the production floor. Additionally, presenteeism can be a common issue among employees with negative attitudes, as they may not be fully engaged in their work and may not give their best effort. This can result in subpar work output and may negatively impact the quality of the final product. Overall, it is important for 3D printing organizations in South Africa to address negative job-related attitudes/behaviour and work to create a positive and productive work environment for all employees.

2.4.1 Defining emotional intelligence

Goleman (2015) describes emotional intelligence as the capability to identify, comprehend, and manage one's emotions and to perceive and influence others' emotions. Mayer, Salovey, and Caruso (2016) delineate it as the ability to perceive, comprehend, utilize, and manage emotions to facilitate thought and action. According to Boyatzis, Goleman, and Rhee (2017), emotional intelligence is the capacity to recognize and understand one's own and others' emotions, and to utilize this awareness to manage personal emotions and relationships effectively. Brackett and Rivers (2019) define it as the skill to recognize, understand, label, express, and regulate emotions accurately and efficiently to foster emotional and intellectual growth. Petrides (2021) outlines emotional intelligence as the competence to comprehend and regulate one's emotions and to understand and respond to others' emotions in a manner that encourages positive interpersonal relationships and effective communication.

Generally, emotional intelligence definitions share a common theme, emphasizing the capacity to recognize and control emotions in oneself and others and the importance of utilizing emotional intelligence for building beneficial relationships and efficient communication. Yet distinctions can be found in the specific elements each definition includes, such as the stress on correctly labeling emotions or incorporating the ability to use emotions to facilitate thought and action. From the researcher's point of view, emotional intelligence is best defined as the ability to perceive and manage emotions within oneself and others, with the goal of nurturing positive relationships and effective communication. This encompasses the capability to accurately discern and categorize emotions and to utilize this understanding to regulate personal emotions and respond appropriately to others' emotions.

Specifically for 3D printing production floor workers in South Africa, emotional intelligence is an essential component for fostering positive relationships and productive communication among team members. Employees possessing high emotional intelligence are better equipped to manage their emotions in stressful situations, communicate effectively with their colleagues and superiors, and handle conflicts in a constructive manner.

2.4.2 Typologies of emotional intelligence

This segment covers three classifications of emotional intelligence, specifically the Ability Model by Mayer and Salovey, Bar-On's Emotional Intelligence Model, and Goleman's Mixed Model of Emotional Intelligence.

2.4.2.1 Mayer and Salovey ability model

The Mayer-Salovey model is often referred to as the Four Branch Model of Emotional Intelligence while the ability model by Mayor and Salovey portrays emotional intelligence using four separate dimensions which are explained further below.

2.4.2.1.1 Identifying emotions

Identifying emotions is the capacity to identify how you and people around you feel about a situation/circumstance (Fernandez-Barrocal & Extremera, 2016). In identifying emotions, one of the basic elements is to pay attention to non-verbal cues and their emotional content. That is to say that, people's emotions must be recognized from their facial appearances as well as the tone of their voices (Mayer et al., 2016). It is important for individuals to possess the capacity to identify their

own personal emotions so that they can know how best to deal with them (Fiori & Antonakis, 2011). It is postulated that individuals possessing emotional intelligence are better equipped to assume leadership roles, as they are capable of comprehending the emotions of their subordinates and facilitating the regulation of their emotions in a suitable manner (Salovey & Mayer, 1990).

2.4.2.1.2 Using emotions to facilitate thought

After identifying one's emotions, an individual must have the ability to give precedence to emotions by weighing them against other feelings as well as opinions. By so doing, an individual gains the ability to control the cognitive processes that inform his/her emotions in situations (Burus, Betnacourt, Hotzman, Minsky, MacCann & Roberts, 2012). From the perspective of scientists in the field of cognition, people who are aware of their emotions are able to have good levels of control over the way and manner in which they think and make decisions (Mayer et al, 2008). Moreover, when it comes to the way and manner in which emotions are being utilized, individuals do differ. Knowledge of one's emotions can help in the taking of future decisions and strategies about life. Furthermore, good knowledge of ones; emotions helps in creativity as well as mood control in order to achieve good results (Mayer & Salovey, 1993).

2.4.2.1.3 Understanding and analyzing emotions

This is about understanding and reasoning about emotions. It involves one's capacity to gain good insights regarding emotions which are complex and also chains of emotions regarding their transitions from one stage to the other (Bracket, Rivers & Salovey, 2011). The proponents of this model hold the view that emotions help in the conveyance of information from one person to the other (Mayer et al., 2016). For example, an emotion of happiness portrays the information of unity while

the emotion of anger carries the information of harm and attack on others. From the perspective of Mayer, Roberts and Barasade (2008) with each kind of information that is portrayed by emotions, its associated actions are also clearly displayed. The authors use anger to cite a practical example. In their example, they argued that the emotion of anger might spark the information of unfair treatment of an individual. However, one's this information is being portrayed there are both positive and negative actions that could follow. In terms of positivity, the individual could seek for peace and calmness in the situation (Brackett, Rivers & Salovey, 2011). Moreover, the anger could also bring about negative actions such as revenge, physical attacks and also withdrawal. In this regard, Mayer et al (2008) do argue that understanding emotions, as well as the actions that are associated with them, helps individuals to reason up and know how best to deal with their emotions to achieve positive outcomes (Banziger, Grandjean & Scherer, 2009).

2.4.2.1.4 Managing emotions

The fourth stage of Mayer and Salovey's ability model is emotional management. In terms of emotional management, the focus lies on how best an individual is able to ensure that his/her emotions are properly regulated in such a way and manner that it achieves positive results (Caruso, Salovey, Brackett & Mayer, 2015). In practical terms, emotional management enables an individual to know and understand the most appropriate approaches to use to control his/her anger or alleviate anxiety when feeling stressed out due to unpalatable circumstances (Antonakis, Ashkanasy & Dasborough, 2009). In order for individuals to be able to manage their emotions, they need to understand that emotions do carry information (Mayer et al, 2008). Emotions are managed as individuals try as much as they can to control the signals that expose their emotions in a negative manner and try to overcome these negative signals in order to put their emotions under control (Alessandri, Vecchione & Caprara, 2015).

In situations whereby individuals are within the comfort zones of their emotions, they are able to deal with their personal emotions which empowers them to be able to also help others manage their emotions (Mayer et al, 2008). There are individual differences with regards to how emotions are being managed as well as how people are able to regulate their emotions (Mayer & Salovey, 1993). It is further argued that emotions and moods that are being regulated by individuals come with both positive and negative affective domains. However, individuals who are emotionally intelligent are able to take advantage of the positive affective state that is associated with the regulation of their emotions while the negative affective state of their emotions become insignificant.

Mayer and Salovey (1997) give the prediction that individuals who are emotionally intelligent are most likely to have been raised in families which are socially adaptable and are able to reframe their emotions effectively. Furthermore, people who are emotionally intelligent show characteristics of optimism and appreciation and also have good role models in their lives. Individuals with high emotional intelligence possess the ability to effectively communicate their emotions and possess adeptness in navigating emotionally charged situations, including but not limited to resolving social and ethical dilemmas, as well as leadership challenges (Mayer et al., 2016).

2.4.2.2 Bar-On model of emotional intelligence

The Bar-On model of emotional intelligence defines an individual's emotional intelligence in the context of their social competencies and abilities in relation to the environment in which they find themselves (Bar-On, Handley and Fund, 2006). According to Bar-On (2004), emotional intelligence comprises a cross-section of interrelated emotional and social competencies, skills, and facilitators that

determine how well we understand ourselves, understand others, and relate to them, as well as how well we cope with daily life demands and pressures. Bar-On (2006) is popular for developing the Emotional Quotient Inventory (EQI), which is responsible for measuring emotional intelligence by dwelling mostly on the social competencies and skills of individuals. According to the Bar-On model, emotional and social competencies could be divided into five factors and fifteen sub-factors. Intrapersonal skills form the first factor, and they comprise the capacity of an individual to be able to become aware and also gain an understanding of their personal emotions. Assertiveness, emotional self-awareness, independence of one's self, and self-actualisation are some of the features of interpersonal ability in an individual (Bar-On, 2010).

Interpersonal ability constitutes the second factor under Bar-On's model, and it comprises an individual's ability to identify and gain understanding of others' emotions in the environment in which he finds himself. The ability of an individual to have features such as being emphatic, having a sense of social responsibility, and building positive relationships with others (Bar-On, 2010). Being adaptable to situations and circumstances is the third factor under Bar-On's model of emotional intelligence, and it comprises other sub-features such as being flexible and having the capacity to solve problems when they emerge. The ability to manage stress effectively is the fourth factor under Bar-On's Model of emotional intelligence, and it has two key features, which comprise pulse control and the ability of an individual to tolerate stressful situations or circumstances. The final factor is General mood, which comprises the ability of the individual to express positive emotions such as optimism and happiness (Bechara, Damasio & Bar-On, 2007).

2.4.2.3 Goleman's mixed model

According to Goleman (1998), the ability to recognize our own feelings and those of others, to inspire ourselves, and to regulate emotions well in both ourselves and our relationships constitutes emotional intelligence. According to Goleman (1998), the ability of an individual to possess emotional intelligence can be described using four dimensions: self-awareness, self-management, social awareness, and relationship management.

According to Bratton, Dodd and Brown (2011), self-awareness refers to the ability of an individual to identify his own emotions in every circumstance in which he finds himself. Individuals who are self-aware have the capacity to know their strengths and weaknesses in every situation in which they find themselves (Gill, Ramsey and Leberman, 2015). Self-aware individuals are open to correction from others because they are always ready to learn from their mistakes and always improve their behavior (Gill et al., 2015).

Self-management is the ability of individuals to control their own personal emotions at the workplace or in any environment in which they find themselves (Ikpesu, 2017). Individuals who are able to manage their own emotions have control over their thought patterns and are able to control how they feel about situations. Individuals with self-management do not act out of impulses but rather have a clear sense of judgment regarding their emotions, especially when taking decisions (Trejo, 2014).

Social awareness is the ability of an individual to understand the emotions of others in every environment in which he finds himself. Social awareness is characterised by having empathy for others and recognizing their feelings, concerns, and needs (Shahid, Stirling and Adams, 2018). The ability to have social awareness helps build trust between leaders and their subordinates at the workplace. Social awareness is

a key skill that is responsible for building strong relationships between leaders and their followers in the organisational contexts (Drigas and Papoutsis, 2019).

Relationship management has to do with the ability to manage the emotions of others in the workplace or any environment where an individual finds himself (Lumpkin and Achen, 2018). People who have the ability to manage relationships are good at resolving conflicts among individuals at the workplace. Relationship management is also characterised by having the ability to provide support, guidance, and feedback to subordinates in the work setting (Alzoubi and Aziz, 2021).

2.4.3 Determinants of emotional intelligence

Literature on the determinants of emotional intelligence which includes motivation, organisational environment and effective leadership are presented in this section.

2.4.3.1 Motivation

The motivation of leaders and subordinates in the organisation has implications for the kind of emotions that they exhibit at the workplace. According to Siswadi and Lestari (2021), what motivates a leader or subordinate at the workplace could either influence emotional expression or not. When employees or managers feel well motivated in their respective organisations, it elicits the display of positive emotions such as happiness and joy, which incites them to work towards the attainment of firm goals. On the other hand, a lack of motivation has the capacity to elicit negative emotions at the workplace, such as anger, frustration, and confusion, among others (Wirawan, Tamar and Bellani, 2019). From the point of view of Hairina (2020), employees who are highly motivated have the ability to regulate their personal emotions and those of others in the workplace better than those who are not well

motivated. Motivated managers or employees, by virtue of their display of positive emotions, are able to show empathy to their co-workers at the workplace and are also calm enough to deal with conflict situations that may arise between co-workers (Philips & Chen, 2018).

The motivation levels of leaders and subordinates on the 3D printing production floor in South Africa have significant implications on the emotions exhibited at the workplace. Highly motivated leaders and subordinates are likely to display positive emotions, such as happiness and joy, which can enhance their productivity and help them achieve organizational goals. Conversely, a lack of motivation can lead to negative emotions such as frustration and anger, which can reduce productivity and create a tense work environment.

2.4.3.2 Organisational environment

The environment in which an employee works is a key indicator of their emotional intelligence. According to Kim and Park (2020), conducive working environments such as good occupational health and safety systems, a calm atmosphere and ambience, good managerial support for employees, good pay and bonus structures, and opportunities for growth and development influence the emotions of employees and managers positively. Due to the conduciveness of the working environment, employees and managers find it easier to manage their emotions at the workplace compared to employees and managers in organisations with poor working environments, such as low salaries and bonuses and poor managerial support (Drigas and Papoutsis, 2019). This is because poor working conditions reinforce negative emotions at the workplace, and hence the possibility of an employee or manager being tangled up in an emotional outburst is high as compared to employees and managers in conducive working environments (Yang, Diaz & Hsu, 2021).

In the case of 3D printing production floor workers in South Africa, it is important for the organization to provide a conducive working environment that promotes positive emotions among employees. This includes ensuring that the workers are provided with safe and healthy working conditions, adequate remuneration and benefits, and opportunities for growth and development. By providing such an environment, the workers are likely to be motivated and exhibit positive emotions such as happiness, which can lead to higher productivity and job satisfaction. Additionally, providing support from management and colleagues can also help regulate emotions and reduce the likelihood of emotional outbursts at the workplace.

2.4.3.3 Effective leadership

There are numerous researchers who have argued that effective leadership exhibited in organisational contexts is a key ingredient for promoting emotional intelligence at the workplace. According to Lone and Lone (2018), leaders who are emotionally intelligent tend to be more effective compared to leaders who are not emotionally intelligent. Apart from this, effective leadership leads to the exhibition of empathy towards subordinates, which helps to bring out the best in employees. From the perspective of Edelman and Van Knippenberg (2018), effective leadership is a tool that helps to promote emotional intelligence among subordinates in organisations. This is because, as leaders show their effectiveness through empathy, conflict resolution, and supervision, among others, their display of emotional control becomes contagious to other subordinates, who therefore regard their leaders as role models (Sharma, 2018; Hajncl & Vucenovic, 2020).

In the context of 3D printing production floor workers in South Africa, it is important for leaders and managers to exhibit emotional intelligence in order to promote a conducive and productive work environment. Effective leadership that promotes

empathy, conflict resolution, and emotional control will help to promote emotional intelligence among subordinates, leading to positive emotions and behaviors at the workplace. In addition, providing opportunities for growth and development, good pay and bonus structures, and good occupational health and safety systems will also contribute to creating a positive working environment and promoting emotional intelligence among employees.

2.4.4 Emotional intelligence and behavior

The emotional states of employees during working hours have a significant impact on both internal and external communication within a company. Workplace events and circumstances have a significant impact on the emotional well-being of employees. According to the findings of Kearney et al. (2017), positive emotions have the potential to enhance desirable outcomes for employees, such as achievement, job enrichment, and an improved social environment. On the other hand, adverse emotions such as fear, anger, stress, hostility, sadness, and guilt can increase the likelihood of workplace deviance and affect the external stakeholders' perception of the organisation.

For 3D printing production floor workers in South Africa, it is important for them to be aware of their emotional states while on the job. Makkar and Basu (2017) noted that it is very typical for a person's feelings to be connected to a particular event or happening and to be intense enough to get in the way of their capacity to think clearly. However, people who are emotionally intelligent and possess the trait of optimism are better able to direct their attention on finding a solution to a problem rather than analyzing what caused it or who is at fault. This is particularly important for workers in the 3D printing industry, as they may face unique challenges that require a creative and solution-focused approach.

Navas and Vijayakumar (2018) noted that every company faces its own unique set of obstacles, which can make employees feel helpless and frustrated at times. However, people who have high emotional intelligence are aware that they should not place the responsibility for their frustrations on the organization because they are able to move between positive and negative affective states with relative ease. This is particularly relevant for 3D printing production floor workers in South Africa, who may face challenges related to the availability of resources, technological issues, and other factors that may cause frustration or stress.

Overall, it is important for 3D printing production floor workers in South Africa to cultivate emotional intelligence, as it can help them navigate the challenges of their work environment and promote positive outcomes for both themselves and their organizations.

2.4.5 Leader emotional intelligence and its implications in the workplace

Baesu (2019) found that emotional intelligence has become increasingly significant in leadership research in recent years. The significance of emotions in leadership and organisations cannot be overstated, as they have a profound effect on both the leader and the follower. According to Issah's (2018) research, emotional intelligence plays a crucial role in determining the effectiveness of leadership. There is a current academic discourse surrounding the importance of emotional intelligence in the context of leadership. Nevertheless, it is widely agreed among experts that further research is crucial to examine the role of emotions in leadership (Miao, Humphrey, & Qian, 2018).

In the context of 3D printing production floor workers in South Africa, emotional intelligence may be particularly relevant in the leadership of teams responsible for operating and maintaining the equipment. Effective leadership in this context

requires the ability to navigate complex technological processes and communicate effectively with team members, customers, and stakeholders. Emotional intelligence may help leaders effectively manage team dynamics, navigate conflicts, and foster innovation.

Despite ongoing debates, numerous studies have found a positive relationship between emotional intelligence and leadership effectiveness (Jimenez, 2018; Adiguzel & Kuloglu, 2019). Emotional intelligence is a crucial factor for leaders of 3D printing production floor teams. It plays a significant role in enhancing customer focus, fostering positive working relationships, securing commitment, nurturing talent, resolving complex issues, and demonstrating stress-tolerant leadership capabilities (Adiguzel & Kuloglu, 2019).

Effective leaders must also be able to create an environment that supports creativity and innovation, and emotional intelligence may help leaders channel team members' emotions into creative problem-solving (Lone & Lone, 2018). Leaders in 3D printing production floor teams must be able to effectively manage emotions in the workplace. Confusion, frustration, and disappointment are common in this field due to the complexity of the technology and the need to continuously improve less-than-ideal conditions (Alotaibi, Amin and Winterton, 2020). Effective leaders must be able to guide team members to identify and seize opportunities and to regulate their emotions in a healthy and productive manner. Research has demonstrated that emotions and effects are closely linked to the leadership process, irrespective of the leadership perspective adopted (Alotaibi et al., 2020).

Finally, emotional intelligence has been found to correlate well with the qualities of effective leaders, particularly those who demonstrate transformational leadership (Potter, Egbelakin, Phipps and Balaei, 2018). In the context of 3D printing production floor teams, effective leaders must be self-aware, interpersonally controlled, and socially confident in order to effectively manage team dynamics,

communicate with customers and stakeholders, and foster innovation (Potter et al., 2018; Edelman and van Knippenberg, 2018). By developing emotional intelligence competencies, leaders can create a workplace culture that fosters creativity, innovation, and excellence. Where is your own voice? These are the perspectives and analysis of others.

2.4.6 Subordinate emotional intelligence and its implications in the workplace

Emotional intelligence (EI) is crucial for employees dealing with emotionally related tasks and responsibilities, particularly in highly stressful working conditions in both the public and private sectors (Lee, 2018; Guy & Lee, 2015). High EI is linked to improved job performance, job satisfaction, and organizational commitment, as well as lower rates of burnout among workers (Arfara & Samanta, 2016; Miao et al., 2017; Sanchez-Gomez & Bresó, 2020). Employers are therefore encouraged to prioritize EI in their recruitment process and training initiatives to enhance employee engagement, motivation, and performance (Arfara & Samanta, 2016; Majeed et al., 2017).

Studies have shown that higher levels of EI in employees lead to better job performance and decision-making, which can positively impact sales revenue and customer satisfaction (Mayer et al., 2012; Cuéllar-Molina et al., 2019; Kernbach and Schutte, 2005). Additionally, high EI levels can help individuals cope with stress, perform well under pressure, and adapt to organizational change (Sanchez-Gomez & Bresó, 2020). Incorporating EI training into workplace sessions can improve the social and behavioral competence of employees, resulting in higher-quality services and better cooperation and conflict management among peers and managers (Muir, 2006; Freshman & Rubino, 2004; Clarke, 2010).

Recent studies have shown that high EI levels are particularly important in mitigating the negative effects of the COVID-19 pandemic on employees' mental health, stress levels, and job performance (Sadovyy et al., 2021; Giorgi et al., 2020). Therefore, it is crucial for organizations to prioritize EI training and development initiatives to support employees' wellbeing and maintain their competitive edge.

The 3D printing production floor workers in South Africa could benefit from EI training and development initiatives to enhance their job performance, cope with stress, and adapt to the changing workplace environment. Incorporating EI training into their workplace sessions could improve their social and behavioral competence, resulting in higher-quality services and better cooperation and conflict management among peers and managers. By prioritizing EI, the organization can improve the employees' well-being and maintain a competitive edge in the 3D printing industry.

2.4.7 Managing emotions at the workplace

Maintaining emotional expression at the workplace is crucial for employees (Hu & Shi, 2015). According to Grandey, Rupp, and Brice (2015), workers on the 3D printing production floor in South Africa are expected to exhibit emotional control to conform to official and informal standards of emotional expression. Wessel and Steiner (2015) define "emotional labor" as employees' efforts to regulate their emotions to meet their organization's display norms or to express particular emotional responses in specific circumstances. The concept of emotional labor also involves controlling one's emotions while engaging in professional activities. On the 3D printing production floor, employees may engage in either superficial or profound acting to modulate their emotions in accordance with the organization's guidelines.

Workers on the 3D printing production floor are often required to modify their facial expressions to convey specific emotions rather than changing their genuine feelings (Grandey, 2003). Therefore, it is essential to put on a happy face and suppress any negative thoughts. However, this type of emotional labor can result in emotional exhaustion, job dissatisfaction, and burnout (Grandey et al., 2015). Superficial acting, which involves suppressing true emotions to display a desired emotion, leads to emotional dissonance, creating tension between feelings and expressions (Pugh, Groth, & Hennig-Thurau, 2011). Such emotional dissonance can lead to emotional weariness, primarily due to the tension and effort involved in enacting superficial acting (Bhave & Glomb, 2016).

Deep acting is the process of modifying one's feelings to express desired emotions (Gabriel & Diefendorff, 2015). 3D printing production floor workers may try to evoke the emotions they require from within themselves genuinely. Deep acting helps reduce emotional dissonance by aligning feelings and expressions (Grandey, 2003). Compared to superficial acting, deep acting results in less emotional exhaustion because employees can regulate their emotions before expressing them (Brotheridge & Grandey, 2002). In fact, Hülshager and Schewe (2011) found that deep acting has no impact on employees' emotional well-being. Although deep acting requires significant energy, it helps conserve energy and resources and acquire new psychological resources (Dahling & Perez, 2010).

In conclusion, emotional labor is an essential component of the 3D printing production floor workers' employment in South Africa. The employees are expected to engage in emotional control to conform to their organization's display norms. Although superficial acting can lead to emotional dissonance and exhaustion, deep acting may reduce the negative impacts of emotional labor. Therefore, 3D printing production floor workers should be aware of the potential impact of emotional labor and use deep acting as a more effective emotional regulation strategy.

2.5 Chapter summary

In this chapter, literature was presented on three constructs namely employee task performance, employee job related attitudes/behaviour and emotional intelligence from the perspective of both leaders and subordinates. From the literature, the researcher concludes that employee task performance, job related attitudes/behaviour and emotional intelligence of both leaders and subordinates has implications for the 3D printing firms in South Africa. The researcher further argues that putting in place the right mechanisms such as prudent working conditions, effective leadership, good organisational environment among others has the potential to enhance employee job performance, positive job attitudes and improved emotional intelligence.

CHAPTER THREE

THEORISATION AND HYPOTHESES DEVELOPMENT

3.1 Introduction

This chapter presented the theoretical literature, conceptual framework as well as the hypotheses development. Theories which were applicable to the study comprised the leader-member exchange theory, emotional contagion theory and the affect events theory. The development of the hypotheses was based on empirical works on the relationships between the following variables: leader emotional intelligence, subordinate emotional intelligence, subordinate job task performance and subordinate job related behaviours.

3.2 Theories applicable to the study

The theories used in the study are presented below.

3.2.1 Leader member exchange (LMX) theory

According to Cropanzano, Dasborough, and Weiss (2017), the theory of leader-member exchange (LMX) is a model of leadership that is based on dyadic relationships. The foundation of LMX theory is the idea that leaders exert power over their subordinates (the "members") by virtue of the rapport they have built with them (Cropanzano et al., 2017). Fostering LMX connections requires both parties to be willing to establish cordial relationships with each other. The norm of reciprocity is a societal stabilizing force that permeates all interpersonal interactions within the context of leader-member exchanges in organisations (Erdogan & Bauer, 2015). According to the LMX theory, employees who work under superiors are

expected to feel obligated to return any special treatment they receive in exchange by going above the requirements of their employment agreements by being extra productive in the performance of tasks assigned to them (Erdogan & Bauer, 2015).

According to the LMX theory, workplace relationships are strengthened by the expectation of repayment of benefits provided based on reciprocity rules (Lloyd, Joer & Voelpel, 2017). LMX relationships between leaders and subordinates enable leaders to offer their subordinates a variety of advantages, such as encouragement, training, and mentorship. As a result of the leader's good relationships and support for subordinates, it is the responsibility of subordinates to also become loyal and productive at the workplace (Lloyd et al., 2015). In this regard, researchers do argue that LMX quality is connected to pro-manager and even pro-organizational actions because of a sense of obligation and high levels of loyalty to the supervisor (Lloyd et al., 2015; Cropanzano et al., 2017).

3.2.1.1 Application of (LMX) theory

Increased performance, dedication, contentment, and supportive behaviors are some of the ways in which both the leader and the subordinate can gain from high-quality LMX relationships (Martin, Thomas, Legood and Dello-Russo, 2018). Organizations can gain a competitive edge if they cultivate productive connections between their leaders and their employees (Martin et al., 2018). Economic exchanges based on contractual agreements characterize low-quality leader-member relationships, with supervisors gaining routine subordinate performance in exchange for standard organizational rewards (Breevaart, Bakker, Demorouti & Van Den Heuvel, 2015). Indeed, it has been discovered that superior LMX is linked to both enhanced in-role performance and increased out-of-role performance (Breevaart et al., 2015). As a result, employees who have good LMX with their superiors are more likely to volunteer for extra tasks or help out their coworkers and

managers (Little, Gooty and Williams, 2016). According to Herdman, Yang, and Arthur's (2017) research, there exists a positive correlation between the quality of leader-member exchange (LMX) relationships and the level of participation exhibited by subordinates in firm citizenship behaviors.

A leader's ability to provide his or her followers with the freedom and responsibility to come up with new ideas depends on the nature of the dyadic relationship between them (Herdman et al., 2017). Innovation has been proven to be positively correlated with the frequency and quality of interactions between leaders and followers (Little et al., 2016). Employee engagement can be increased through the cultivation of high-quality LMX relationships (Breevaart et al., 2015). According to Kim, Liu and Diefendorff's (2015) research, an employee's relationship with his or her direct supervisor is the most important factor in determining whether or not the employee will remain in his or her position and whether or not the employee will be able to maximize his or her potential at the workplace. It is widely recognised that employees tend to stay longer with their organisations and make progress in their careers when they maintain favorable associations with their managers (Kim et al., 2015). In a nutshell, when employees' personal vision, mission, and goals are aligned with those of the organization, it is easy to see how strong LMX relationships may foster a culture of dedication to the company's success (Herdman et al., 2017). Such a fit benefits both the company and its staff. Therefore, motivated workers who want to further their careers inside the company might push themselves farther to help their managers achieve their goals (Herdman et al., 2017).

3.2.1.2 Critique of (LMX) theory

A poor leader-member exchange is one in which the only basis for the connection leaders and subordinates is based on the terms of the job contract (Sheer, 2015).

Leaders with poor leader-member exchange relationships are often viewed as autocratic and frequently resort to leader dominance displayed in communication (Sheer, 2015). Low quality leader-member exchange has been linked in the literature on abusive supervision and abusive leadership (Gottfredson, Wright & Heaphy, 2020). Leader-member exchange theory has also been criticized for being too static and not considering external factors (Gottfredson et al, 2020). What about any gap you pick apart from what others say and how you can fill that?

3.2.1.3 Justification for using (LMX) theory in the study

The LMX theory is justified for this study because it helps to explain the relationships between leader emotional intelligence and subordinate task performance as well as subordinate job related behavior. Leaders with high levels of emotional intelligence have the potential to develop quality and cordial relationships with their subordinates and by reciprocity, subordinates will be motivated to give off their best in the performance of tasks assigned to them at the workplace. In this regard, within the context of 3D printing firms, leader's emotional intelligence is of essence in building strong ties/relationships between leaders and subordinates in order to enhance subordinate task performance and also subordinate job related behavior.

3.2.2 Emotional contagion theory (ECT)

Emotional contagion refers to the process whereby one person or group can impact the emotions or attitude of another person or group through the conscious or unconscious induction of emotion states and attitudes. This can occur between individuals as well as between groups (Hatfield, Cacioppo & Rapson, 1994). Employees can pass on both positive and negative feelings to one another within the setting of an organization, which has a direct impact on the quality of the

collaborative work they do together (Barsade, 2002). According to Côté and Hideg (2011), people who work in interdependent teams and who must coordinate their efforts, communicate effectively, and influence one another are particularly susceptible to the negative effects of emotional contagion on their work performance. According to Sy, Côté, and Saavedra (2005), effective leaders are able to inspire their followers to feel good about themselves and their work, which in turn leads to improved job performance.

3.2.2.1 Application of emotional contagion theory (ECT)

Emotional contagion has been studied by a wide range of disciplines because it can occur through so many different types of interactions, including monetary transactions, team communication, and human interactions (Barsade, Coutifaris and Pilemer, 2018). To what extent happy or negative emotions can spread from one person to another and influence their work behaviour has been the primary focus of studies on emotional contagion (Tee, 2015).

Researchers have found that in face-to-face interactions, emotions can be passed from a leader to a subordinate and vice versa, which therefore highlights the relevance of facial expressions in emotional contagion (Snaebjornsson & Vaiciukynaite, 2016). Within the organisational context, the emotion of joy and happiness, which is characterised by facial smiles and cheerfulness, could be transmitted from leaders to subordinates and vice versa. On the other hand, the exhibition of negative emotions such as anger could be transmitted from leaders to subordinates, thereby making the organisational environment toxic and unproductive (Liu, Chi & Gremler, 2019). In a study that was conducted by Deng and Hu (2018), it was found that emotional contagion could be expressed through positive emotional processing, which leads to the exhibition of positive emotions at the workplace. On the other hand, negative processing of emotions leads to the

exhibition of negative emotions at the workplace as leaders and managers interact with each other.

3.2.2.2 Critique of ECT

The emotional contagion theory is being criticised for concentrating on only the transfer of emotions from one person to another in the organisational context without paying any attention to organisational factors that could trigger the exhibition of positive or negative emotions at the workplace (Ustrov, Valverde & Ryan, 2016). Researchers have argued that the emotional contagion theory is too simplistic in understanding the processing and transfer of emotions from leaders to subordinates since mimicking and facial expressions are not enough to trigger positive or negative emotions at the workplace (Ustrov et al., 2016; Chen, Kong, Niu, Gao & Li, 2019). It is being argued that the kind of organisational climate existing in the organisation has implications for the exhibition of positive or negative emotions among leaders and subordinates. Moreover, personal issues such as employee personality types and their level of emotional maturity also have implications for the extent to which emotional contagion can occur in the organisational context (Chen et al., 2019).

3.2.2.3 Justification for using ECT in the study

The emotional contagion theory is relevant to this current study because it could help explain the effect of managers' emotional intelligence on subordinates' emotional intelligence. In this regard, the exhibition of high levels of emotional intelligence on the part of leaders could elicit high levels of emotional intelligence in subordinates in the production floor section of 3D printing firms.

3.2.3 Affect events theory (AET)

The goal of Affect Events Theory (AET) is to explain why and how specific experiences elicit emotional responses from people, and how those responses in turn shape their perspectives and actions. AET is defined by Weiss and Cropanzano (1996) as the part played by an individual's feelings and appraisals in the chain of causation that connects their experiences to their actions. The primary idea behind Affect Events Theory is that an individual's attitudes and actions in the workplace are heavily influenced by their emotional reactions to those events (Rosen et al., 2009). Attitudes toward work are shaped in part by an individual's emotional reactions.

Positive and negative affective events are more likely to occur in a consistent work environment, and exposure to these events will lead to corresponding emotional states, a process that may be influenced by the individual's personality. It's possible that a person's secure working conditions have an indirect effect on their mood, which in turn may lead to affect-driven behaviors that shape a certain attitude toward work.

3.2.3.1 Application of affect events theory

Empirical research supports the fundamental ideas of AET, which indicate that emotions account for how different events in the workplace affect workers' job satisfaction and unproductive actions (Cropanzano, Dasborough & Weiss, 2017). An emotional "event" or "episode" at the workplace may be the cause of an emotional reaction, which in turn mediates affect-driven behavior and attitudes, as described by Affective Event Theory (AET) (Cropanzano et al., 2017). It is perceived as a strength that positive emotional states can develop in response to

events at work, and it is seen as a weakness that negative emotional states might develop in response to events at work.

An employee's behavior on the job could be affected by their mood, for better or worse (Ashkanasy & Dorris, 2017). When people are feeling upbeat, they are more likely to see the world in a positive light. As a result, individuals are more likely to see the world and the people in it as forces for good rather than as potential dangers, which can lead to more constructive decision-making and behavior (Ashkanasy, Zerbe & Hartel, 2016). Those who are feeling down, on the other hand, are more likely to have a negative viewpoint on life, view recent events as threats or disadvantages, have less favorable judgments of other people, and make less optimistic decisions (Ashkanasy et al., 2016). A manager's praise can motivate an employee to put forth extra effort and increase their level of enthusiasm for their work (Bakker, 2015). Conversely, a person's negative emotions and resistance to change after receiving a negative review might contribute to a pessimistic outlook on work and subpar performance (Bakker, 2015).

3.2.3.2 Critique of AET

Although the affect event theory proposes that employee exhibition of emotions and work behavior is affect-driven, critics argue that the affect-driven behavior of employees eventually makes them exhibit judgment-driven behaviors (Agote, Aramburu and Lines, 2016). For instance, an employee may receive criticism from their manager as a result of a demanding assignment at the workplace (a negative event) (Agote et al., 2016). This could result in feelings of anger, grief, or frustration (affective states), all of which can contribute to an attitude of discontent with one's employment. It could also lead to an altercation between an employee and their supervisor (affect-driven behavior) (Judge and Yoon, 2015). Moreover, being unhappy in one's employment makes an employee less likely to want to remain with

the same firm (judgment-driven behavior) (Judge and Yoon, 2015). Affective work events are also known to have an effect on the psychological welfare of employees which incites them to become more judgement-driven when taking decisions about their work at the organisation (Judge, Weiss, Kammeyer-Mueller and Hulin, 2017). The judgmental-driven nature of employees becomes inevitable because employees have their own unique perspectives on the happenings at work, and these perspectives are influenced by a variety of elements, including the nature of the issue, the employees' personalities, and the behavior of their managers and supervisors (Judge et al., 2017).

3.2.3.3 Justification for the use of AET in the current study

The affect effect theory is relevant to this study because it helps to explain the relationships between subordinates' emotional intelligence and subordinate job performance and job behavior. The study posits that the capacity of 3D printing personnel to recognize and regulate their individual emotions in the workplace has ramifications for effectively handling work-related occurrences that impact their job performance and conduct in the workplace. Same

3.3 Conceptual framework

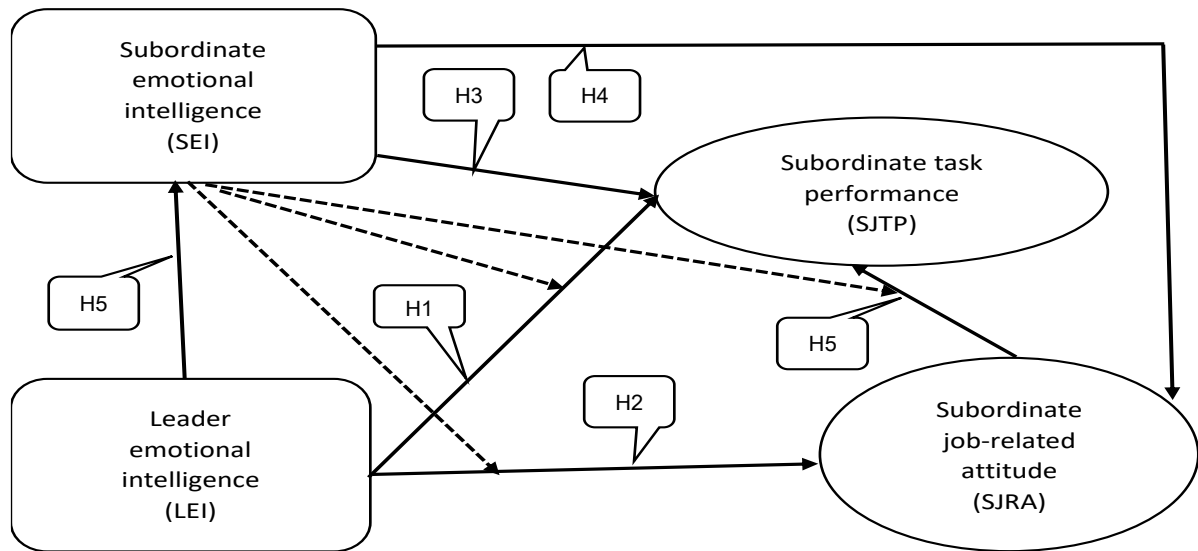


Figure 3.1: Conceptual Framework of the study

Figure 3.1 presents the conceptual framework of the study. The conceptual framework predicts that significant positive relationships exist between leader emotional intelligence, subordinate leader intelligence and subordinate job task performance as well as subordinate job-related attitude/behaviour. The conceptual framework also predicts that subordinate emotional intelligence moderate the relationship between subordinate job task performance and subordinate job related behaviour, leader emotional intelligence and subordinate job related behaviour and also leader emotional intelligence and subordinate job task performance among 3D printing production floor workers in South Africa.

3.3.1 Leader emotional intelligence and subordinate job-task performance

Bambole, Kassim, and Musa (2016) set out to examine the influence of emotionally intelligent leadership on employee performance in Nigerian tertiary institutions.

Using a cross-sectional survey research design, the study enrolled 339 staff members from these institutions as participants. Multiple regression was utilized as the statistical approach to analyze the collected data. The findings showed a significant positive relationship between leaders' emotional intelligence and employee job performance within Nigerian tertiary institutions. Similarly, Alheet and Hamdan (2021) carried out a study in the Jordanian retail sector to explore the link between leaders' emotional intelligence and employee job performance. They used a quantitative descriptive research design and included 120 employees from the Jordanian retail industry in the study. The results revealed a notable positive correlation between leaders' emotional intelligence and employee job performance. Based on the results of studies (Bambole et al., 2016; Alheet & Hamdan, 2021), the study hypothesises as follows: *H1: There will be a significant positive relationship between leader emotional intelligence and subordinate job-task performance.*

3.3.2 Leader emotional intelligence and subordinate job-related behaviours

Dartey-Baah and Mekpor (2017) undertook a study to evaluate how a leader's emotional intelligence impacts the discretionary work behaviours of employees in Ghana's banking sector. The research, using a quantitative approach, involved 234 participants. The study's outcomes pointed towards a positive relationship between leaders' emotional intelligence and the exhibition of organizational citizenship behaviours. In a separate study, Shrestha and Baniya (2016) sought to ascertain the effect of leaders' emotional intelligence on employee outcomes in public and private entities in Nepal. Utilizing a quantitative methodology, the research involved 229 employees. The results of their multiple regression analysis showcased a significant positive link between leaders' emotional intelligence and various employee outcomes, including commitment, job satisfaction, and organizational citizenship behaviours. Based on the studies from literature (Dartey-Baah and Mekpor, 2017; Shrestha and Baniya, 2016), the study hypothesised that: *H2: There*

will be a significant positive relationship between leader emotional intelligence and subordinate job related behaviours.

3.3.3 Subordinate emotional intelligence and job-task performance

Sambu (2019) conducted a study focusing on the correlation between teachers' emotional intelligence and their job task performance in Kenyan schools. This quantitative study included 47 teachers as participants. The findings suggested a significant association between teachers' emotional intelligence and their task performance.

Similarly, Akhtar, Ghufraan, Husnain, and Shahid (2017) embarked on research to evaluate the impact of emotional intelligence on job performance, considering perceived organisational support as a moderating variable. This quantitative study utilized questionnaires to survey 316 bank employees in Pakistan, concluding that there's a significant link between employees' emotional intelligence and job performance. The study further found that perceived organisational support does have a moderating effect on this relationship.

Gunu and Oladepo (2014) pursued research to examine the effect of workers' emotional intelligence on their dedication and output in the Nigerian manufacturing industry. This quantitative descriptive study involved 206 participants who completed questionnaires. The results suggested a significant positive link between employees' emotional intelligence and their commitment and job performance. Rexhepi and Berisha (2017) carried out a study to assess how employees' emotional intelligence influences their job performance in private and public entities in Macedonia. Their quantitative research involved 265 employees and revealed a positive correlation between employees' emotional intelligence and their job performance.

Sehran and Gazzaz (2019) conducted a study to evaluate the impact of bank employees' emotional intelligence on their job performance within Saudi Arabia's banking sector. This research, which involved 300 participants, used regression analysis to reveal a significant positive relationship between employees' emotional intelligence and their job performance. Based on the results from studies conducted by Gunu and Oladepo (2014); Rexhepi and Berisha (2017) as well as Sehran and Gazzaz (2017), the researcher hypothesises that: *H3: There will be a significant positive relationship between subordinate emotional intelligence and subordinate task performance.*

3.3.4 Subordinate emotional intelligence and job related behaviour

Research suggests a positive link between the emotional intelligence of leaders and their subordinates' job-related behaviour (Batool, 2013). It's observed that individuals with high emotional intelligence often exhibit beneficial work behaviors, such as commitment, punctuality, and a positive attitude towards their job. These individuals also tend to experience lower work-related stress levels (Bahl, 2016; Cekmecioğlu et al., 2012).

Sarangi and Vats (2015) explored the impact of employee emotional intelligence on their engagement levels within the professional landscape of India. This quantitative research included 182 professionals and found that employees with higher emotional intelligence demonstrated increased engagement, characterized by vigor, dedication, and absorption. Naz, Li, Nisar, and Rafiq (2019) researched the connections between employee emotional intelligence and knowledge sharing behavior, with job satisfaction and employee commitment acting as mediating factors. Their quantitative study, involving 340 Pakistani call center employees, found that emotionally intelligent employees were more likely to engage in knowledge sharing. The relationship between emotional intelligence and

knowledge sharing behavior was found to be mediated by the employees' job satisfaction and commitment levels.

Lastly, Matheri, Karanja, and Namusonge (2018) investigated the influence of employee emotional intelligence on their commitment to savings and credit institutions in Kenya. The quantitative study, involving 238 employees, found a significant positive correlation between employee emotional intelligence and their commitment to the organization. Based on the studies from literature (Cekmecioğlu et al, 2012; Batool, 2013; Sarangi and Vats, 2015; Bahl, 2016; Matheri et al, 2018; Naz et al, 2019), the study hypothesises that: *H4: There will be a significant positive relationship between subordinate emotional intelligence and subordinate job-related behavior.*

3.3.5 Subordinate job related behaviours and job-task performance

Research has demonstrated that there is a correlation between the job-related behaviour of subordinates and their job task performance, as evidenced by studies conducted by Bahl (2016) and Cekmecioğlu et al. (2012). Khan, Dongping, and Ghauri (2014) conducted an assessment on the influence of employee job-related attitudes/behaviour on job-task performance within the textile industry of Pakistan. Their findings indicate that job-related attitudes/behaviour have a significant impact on job-task performance. According to a study conducted by Hettiararchchi and Jayarathna (2014) in Sri Lanka, task performance was influenced by job-related attitude. From the literature (Bahl, 2016; Cekmecioğlu et al., 2012; Khan et al, 2014; Hettiararchchi and Jayarathna, 2014), the study proposes a hypothesis as follows: *H5: A significant positive relationship will exist between subordinate job related attitudes and subordinate job task performance.*

3.3.6 Moderating role of subordinate job related behaviours in the leader emotional intelligence and subordinate job-task performance relationship

Studies have explored the relationship between leaders' emotional intelligence and job-related behaviors. Shrestha and Baniya's (2016) research highlighted a significant link between leaders' emotional intelligence and employees' job-related behaviors such as commitment, job satisfaction, and organizational citizenship behaviors. Dartey-Baah and Mekpor (2017) found that leaders' emotional intelligence positively impacted employees' voluntary behaviors. Notably, employees' job-related behaviors were found to have a positive correlation with job-task performance. Dongping and Ghauri's (2014) study further reinforced this by revealing a positive relationship between employees' positive job-related attitudes/behaviour and their job task performance. Due to the bi-directional relationship between subordinate job-related behaviours and leader emotional intelligence, and subordinate job task performance (Shrestha and Baniya, 2016; Dartey-Baah and Mekpor, 2017; Dongping and Ghauri, 2014), the researcher hypothesises that: *H6: Subordinate job related behaviours moderates the relationship between leader emotional intelligence and subordinate job task performance.*

3.3.7 Moderating effect of subordinate emotional intelligence in the leader emotional intelligence and subordinate job-task performance relationship

Research has demonstrated that there are notable correlations between the emotional intelligence of leaders and that of their subordinates, with positive outcomes. A study conducted by Kaplan, Cortina, Ruark, Laport, and Nicolaides (2014) found a positive correlation between the display of emotional intelligence by leaders and their subordinates. According to Kaplan et al. (2014), leaders who demonstrate emotional intelligence in the workplace serve as exemplary figures to their subordinates, thereby positively influencing them to exhibit emotionally

intelligent behaviours such as empathy. Research has indicated that there is a noteworthy positive correlation between the emotional intelligence of subordinates and their job task performance. Research conducted by Sambu (2019), Sehran and Gazzaz (2019), and Reshepi and Berisha (2017) has shown that subordinates who exhibit emotional intelligence in the workplace are more likely to effectively carry out assigned tasks. Since subordinate emotional intelligence has positive relationships with leader emotional intelligence and subordinate job-task performance (Kaplan et al., 2014; Sambu, 2019; Sehran and Gazzaz, 2019; Reshepi and Berisha, 2017), the researcher hypothesises that: *H7 Subordinate emotional intelligence moderates the relationship between leader emotional intelligence and subordinate job task performance.*

3.3.8 Moderating effect of subordinate emotional intelligence in the leader emotional intelligence and subordinate job-related behaviours relationship

Studies have demonstrated that the exhibition of emotional intelligence by leaders has a favourable influence on the exhibition of emotional intelligence by subordinates in the workplace (Kaplan et al., 2014). According to Thiel, Griffith, and Connelly's (2015) research, there is a positive correlation between leaders' emotional intelligence and their employees' emotional intelligence. This is due to the emotional connection that employees have with their leaders. According to Sy, Horton, and Riggio (2018), mentoring relationships established between leaders and their subordinates have been found to have a positive impact on the emotional intelligence displayed by subordinates in the workplace. Research has indicated that subordinates with higher levels of emotional intelligence exhibit positive effects on their job-related behaviours, including voluntary actions and engagement in the workplace. As per the findings of Matheri et al. (2018), there exists a positive correlation between the emotional intelligence of subordinates in a workplace and their level of commitment towards the organisation. This commitment is often

demonstrated through their emotional attachment to the organisation. According to Sarangi and Vats' (2015) research, there exists a positive correlation between the emotional intelligence of subordinates and their level of engagement with assigned work within the workplace. Due to the bi-directional relationships existing between subordinates' emotional intelligence, the leader's emotional intelligence, and the subordinate's job task performance (Kaplan et al., 2014; Sarangi and Vats, 2015; Sy et al., 2018), the researcher hypothesises that: *H8: Subordinates emotional intelligence moderates the relationship between leaders' emotional intelligence and subordinates' job related behaviour.*

3.3.9 Moderating effect of subordinate emotional intelligence in the subordinate job-related behaviours and job-task performance relationship

Studies have shown that subordinate emotional intelligence has significant positive associations with subordinate job-related behaviours such as positive attitudes towards work. According to the research conducted by Hettiararchchi and Jayarathna (2014), it was discovered that the emotional intelligence of subordinates has a positive impact on their display of favourable attitudes, such as coworker support, within the workplace. Results from studies have also shown that subordinate emotional intelligence is positively associated with subordinate job-task performance. Akhtar et al. (2017) conducted a study that found that subordinate emotional intelligence is positively associated with subordinate job task performance. Another study by Gunu and Oladepo (2014) also shows that there is a significant positive association between a subordinate's emotional intelligence and their job-task performance. Since subordinates emotional intelligence has positive associations with subordinates' job task performance and subordinates job-related behavior (Hettiararchchi and Jayarathna, 2014; Gunu and Oladepo, 2014; Akhtar et al., 2017), the researcher hypothesizes that: *H9 Subordinates' emotional*

intelligence moderates the relationship between subordinate's job task performance and subordinates job related behavior.

3.3.10 Research gaps and conclusions

From the empirical literature on the relationships among the variables being investigated, the researcher identified a knowledge gap. The knowledge gap emanated from the premise that, although studies have assessed relationships between leader's emotional intelligence, subordinates' emotional intelligence, and subordinate's job task performance and job-related behaviours, such studies have been conducted in different industrial or sectoral contexts such as retail, banking, and public institutions, among others, with less attention given to the 3D printing sector. In this regard, the conduct of this study within the 3D printing sector will fill the knowledge gap in the literature. In this regard, the study/literature? (I think conclusions can be drawn after combining the literature review and the empirical study and not at this point) concludes that the findings of this study will be instrumental in contributing to knowledge in the area of 3D printing in South Africa on the relationships between a leader's emotional intelligence, subordinates' emotional intelligence, and subordinate's job task performance, and subordinate's job-related behaviours.

3.4 Chapter Summary

This chapter has provided and justified the application of leader member exchange theory, emotional contagion theory and the affect events theory in explaining the relationships between leader's emotional intelligence, subordinates' emotional intelligence and subordinate's job task performance and subordinate's job related behaviours, The chapter has also dwelled on the conceptual framework to develop

hypotheses based on the direct and moderating relationships among the variables of the study.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

The previous chapter presented empirical literature leading to the development of hypotheses on the direct and indirect relationships between leader emotional intelligence, subordinate emotional intelligence, subordinate job task performance and subordinate job related attitude among 3D printing production floor workers. In this chapter, the methodological approaches used in the study are being discussed and justified. The components of the methodology comprised the following: research paradigm, research approach, target population, sample size, sampling techniques, data collection instruments, data collection process, ethical issues and also data analysis techniques.

4.2 Research paradigm

The research paradigm is defined by Rahi (2017) as the worldview of the researcher which informs how reality is understood when investigating a phenomenon. Although various forms of research paradigms exist, such as positivist, interpretivist, constructivist, critical theory, and post-positivist, among others (Rahi, 2017), The positivist research paradigm was adopted in this study. This is because the positivist research paradigm enables a researcher to investigate a phenomenon in an objective manner (Rehman & Alharthi, 2016). A research paradigm that uses positivist research ensures that the researcher is separated from what is being studied in order to ensure that the data being gathered is not manipulated in any way (Kivunja & Kuyini, 2017).

In this study, the choice of the positivist research paradigm was justified on the premise that it enabled the researcher to objectively examine the direct and indirect (moderating) relationships between leader emotional intelligence, subordinate emotional intelligence, subordinate job task performance, and subordinate job-related attitude among 3D printing production floor workers in South Africa. Furthermore, the respondents that participated in the study were independent in providing their opinions through the use of online surveys, which implies that the researcher did not engage in any form of data manipulation.

4.3 Research design

The research design is the overall roadmap that guides the researcher to achieve the research objectives (Dannels, 2018). The main types of research designs are exploratory, explanatory and descriptive (Saunders, Lewis & Thornhill, 2019). Among these three research designs, the explanatory research design was most appropriate for this study or in all situations and cases?. According to Wright et al. (2016) explanatory research designs are important for testing the relationships between two or more variables based on proposed hypotheses. In this regard, since this study tested for hypotheses on both direct and indirect (moderating) relationships between leader emotional intelligence, subordinate emotional intelligence, subordinate job task performance and subordinate job related attitude, the explanatory research design was justified.

4.4 Research approach

The quantitative research approach was adopted in this study. Creswell (2014) attests that quantitative research is characterised by the utilisation of numerical data to elucidate or comprehend a phenomenon by means of hypothesis testing

with the aid of suitable statistical techniques. The adoption of quantitative research approach was therefore justified for this study because, the researcher used questionnaires to gather numerical data which were used to test hypothesis using appropriate statistical tools such as SPSS and Smart PLS 4. The use of the quantitative research approach was also important to enable the researcher to generalize the findings to the 3D printing sector in South Africa.

4.5 Population and sampling

This section presents the target population of the study, sample size and sampling techniques used for selecting participants of the study.

4.5.1 Target population

The target population constitute all the units that possess features of interest to the researcher (Creswell & Poth, 2018). In this study, target population constituted 3D printing firms employees that participated in the 23rd Annual RAPDASA Conference held from 9th to 11th November, 2022. Where? The total number of two hundred and seventy five (275) employees of 3D printing firms participated in the 23rd RAPDASA Conference.

4.5.2 Sample size

The sample size of this study was determined using the Rao Soft sample size calculator. According to the Rao Soft sample size calculator, the appropriate sample size for a population of two hundred and seventy-five is one hundred and sixty one (161). Thus, one hundred and sixty-one (161) constituted the study's sample size. The formula can shed light on it.

4.5.3 Sampling technique and procedure

The selection of respondents employed a simple random sampling technique to ensure fairness and equal opportunity for all participants in the study. Given the utilization of Google Forms as an online data collection method, the adoption of this technique allowed each individual to have an unbiased chance of being chosen. The process began by assigning numerical values to the emails of the 275 employees affiliated with 3D printing firms and institutions who participated in the 23rd RAPDASA Conference. To execute the simple random sampling technique, a random number generator function in Statistical Package for Social Sciences (SPSS) version 26 was utilized. This generated a set of random numbers corresponding to 161 participant emails, selected from the overall population of 275. However, out of a total of 161 questionnaires that were administered, a total of one hundred and fifty four (154) could be retrieved, which gave a response rate of 95.7%.

4.6 Data collection

In this section of the methodology, the data collection instruments and data collection procedure are presented.

4.6.1 Data collection instruments

Likert scale questionnaire was used to collect data. For leaders and subordinates' emotional intelligence, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) was used. The MSCEIT is an ability-based test designed to measure the four dimensions of emotional intelligence proposed by Mayer and Salovey (1997). Subordinates' job task performance will be measured using the Individual Work Performance Questionnaire (IWPQ) which was developed by Koopmans,

Bernaards, Hilderbrandt, Van Buuren, Van Der Beek and De Vet (2013). The IWPQ 1.0 consists of 3 scales (task performance, contextual performance, and counterproductive work attitudes) (Koopmans et al., 2013). Employee job-related vigor, dedication, absorption was measured using Utrecht Work Engagement Questionnaire. However, items on job related attitudes were self-designed questionnaires based on relevant literature.

The questionnaire was grouped under four sections. Section A assessed the demographic data of the respondents such as their age, gender, highest level of education, job title, category of 3D printing firm, ethnic origin and number of years spent working in a 3D printing firm. Section B asked question on leader emotional intelligence and subordinate emotional intelligence. Section C asked questions pertaining to employee job performance while section D asked questions pertaining to employee job related behaviors. The items for measuring the constructs was rated on a six (6) point likert scale where 1=Strongly disagree, 2=Slightly disagree, 3=Disagree, 4=Agree, 5=Slightly Agree and 6=Strongly Agree.

4.6.2 Data collection procedure

The study's data collection was conducted using an online platform, specifically "Google Forms." The researcher received approval from his supervisors to convert the approved questionnaire into an online version. The randomly selected participants received an email containing the online questionnaire. The researcher utilized the SPSS random generator to ensure the sample selected was unbiased. The data collection period spanned three (3) months, during which respondents were encouraged to complete the online questionnaire. Due to delays in the submission of responses, periodic email reminders were sent to participants. The researcher continued sending reminders until an acceptable response rate was achieved, allowing for accurate data analysis. Both leaders and subordinates

answered the same questionnaire. However, there were clear instructions in the questionnaire that guided respondents to respond to questions that were meant for them either as leaders or subordinates. Due to the clarity of information in the questionnaire, leaders did not answer sections on subordinate emotional intelligence and vice versa.

4.7 Validity and reliability assurance

Validity is defined as the ability of a research instrument to measure what it actually seeks to measure (Ghazali, 2016). The theoretical assessment of validity method which constitute face and content validity will be used by the researcher.

4.7.1 Validity Assurance

To achieve face validity, the following measures were used. Firstly, to ensure that the constructs being investigated are accurately measured, the researcher ensured that they were well defined based on appropriate literature (Ghazali, 2016). After defining the constructs appropriately, the researcher deduced items to measure the constructs from literature and also with support from existing standardized questionnaires. To fortify content validity, the researcher engaged experts from academia and industry to assess measurement items. By soliciting ratings, the study aimed to align items with intended construct objectives. Expert evaluations helped refine the congruence between items and their operationalizations, ensuring that the assessment accurately reflected the constructs as defined in the literature. This meticulous process, involving input from diverse specialists, bolstered the instrument's ability to authentically measure targeted attributes, enhancing the overall quality and precision of the research instrument in assessing the intended constructs in both academic and practical contexts.

4.7.2 Reliability Assurance

Regarding reliability, the focus was to ensure that any kind of hindrances that could bring about subjectivity and inaccuracy in gathering data from respondents are being avoided (Surucu & Maslakci, 2020). To enhance reliability, the researcher opted for questionnaires over subjective observations. The choice aimed to minimize response variability and maintain consistency in data collection. Emphasizing practical relevance, the questionnaire's content centered on managerial aspects within the 3D printing environment, ensuring respondents could easily connect with and express informed opinions. Furthermore, linguistic simplicity became a priority to prevent comprehension barriers. The researcher meticulously crafted questions using straightforward language, devoid of unnecessary complexity. This approach aimed to facilitate clear understanding, encouraging participants to provide accurate and reliable responses. By eliminating potential linguistic obstacles and focusing on contextually meaningful content, the researcher optimized the questionnaire's effectiveness as a reliable tool for gauging managerial insights in the specific domain of 3D printing, thereby bolstering the overall reliability of the research findings.

4.8 Ethical considerations

The following ethical issues were addressed during the data collection process: informed consent, anonymity and confidentiality. A written consent letter was given to respondents to seek for their consent to participate in the study. Only employees who agreed to participate in the study by appending their signature to the consent letter was included. Anonymity was maintained as the researcher ensured that any kind of information that defined the identity of respondents such as their names, telephone number, residential address were not included in the questionnaire. To ensure confidentiality, the researcher ensured that data gathered are kept from any

third parties as the data was used for research purposes only. Ethical clearance was also obtained from the university.

4.9 Data Analysis

The Statistical Package for Social Sciences (SPSS) version 26 and Smart PLS 4 were used to analyze the data. Specifically, the SPSS software was used for data coding and entry. The SPSS software was also used for carrying out descriptive analysis on demographic data as well as the variables of the study. Smart PLS 4 was used for conducting partial least squares structural equation modeling for direct and indirect (moderating) effects on the relationships between leader emotional intelligence, subordinate emotional intelligence, subordinate job task performance and subordinate job related attitude among 3D printing production floor workers.

4.10 Chapter summary

This chapter offered a comprehensive account of the methodology employed to fulfill the study's objectives. The selection of the positivist research paradigm was justified appropriately by the researcher. Furthermore, the choice of an explanatory research design and quantitative research approach was soundly justified. To form the sample, a simple random sampling technique was employed, resulting in the selection of 161 participants from a population of 275 individuals. The data collection process involved the utilization of questionnaires as the primary tool. The online platform "Google Forms" was utilized for the data collection process, while the subsequent analysis was performed using SPSS and Smart PLS, which are recognized software packages for statistical analysis.

CHAPTER FIVE

RESULTS AND DISCUSSIONS

5.1 Introduction

This chapter presents the results of the study and also discussed in line with relevant literature. The results begin with the demographic analysis which comprised participant's gender, age, highest educational qualification, work title/specification and also the number of years spent working in a 3D printing firm in South Africa. The second section of this chapter presented and discussed results on the descriptive statistics of the variables used for the study: leader emotional intelligence dimensions (self-awareness, self-management, social awareness, relationship management), employee job performance (task performance, contextual performance, counterproductive behaviors), leader emotional behavior (anger, confusion/bewilderment, depression, anxiety/tension, fatigue/strain, vigor, friendliness) and organisational emotional climate (love, joy, fear and sadness). The third section presents result on the PLS Structural Equation Modelling for testing hypotheses proposed.

5.2 Response rate

A total of one hundred and sixty-one (161) questionnaires were administered online using google forms. Out of the one hundred and sixty-one (161), a total of one hundred and fifty four (154) was returned giving a response rate of 95.7%. According to Saunders, Lewis and Thornhill (2019), when conducting a quantitative survey, a response rate that is greater than 70% makes the data appropriate for data analysis. Since this study had a response rate of 95.7%, the researcher deemed it appropriate to commence with data analysis.

5.3 Demographic Information of respondents

This section presents results on the demographic information of the respondents such as age, gender, level of education, work title, firm category, ethnic origin and tenure.

Table 5.1 Demographic information

Age	Frequency	Percentage (%)
26-30 years	27	17.5
31-35 years	33	21.4
36-40 years	51	33.1
41-45 years	28	18.2
46-50 years	10	6.5
More than 50 years	5	3.2
Total	154	100
Gender	Frequency	Percentage (%)
Male	125	81.2
Female	29	18.8
Total	154	100
Highest Educational Level	Frequency	Percentage (%)
Advanced certificate	4	2.6
Diploma	14	9.1
Bachelors/Advanced diploma	24	15.6
Honors/Postgraduate Diploma	41	26.6
Masters	59	38.3
Doctorate	12	7.8
Total	154	100

Work title	Frequency	Percentage (%)
Business developer	18	11.7
IT personnel	17	11
CAD Designer	34	22.1
Operations Personnel	26	16.9
Sales personnel	17	11
Researcher	25	16.2
Marketing Officer	17	11
Total	154	100
Firm Category	Frequency	Percentage (%)
3D machine reseller	11	7.1
3D machine supplier	16	10.4
Consulting	59	38.3
3D software and related technologies	51	33.1
Design and Tool making	17	11
Total	154	100
Ethnic Origin	Frequency	Percentage (%)
Black South African	73	47.4
Other Black African	29	18.8
White South African	26	16.9
Colored	26	16.9
Total	154	100
Tenure	Frequency	Percentage (%)
1-3 years	22	14.3
4-6 years	76	49.4
7-10 years	34	22.1
More than 10 years	22	14.3
Total	154	100

According to results from table 5.1, most of the respondents were between the ages of 36-40 years as they constituted 33.1%. However, 21.4% were between 31-35 years, 18.2% were between 41-45 years while 17.5% were between 26-30 years. Minority of the respondents were between 45-50 years (6.5%) and more than 50 years (3.2%) respectively. In terms of gender, it was found that most of the respondents were males as they comprised 81.2%, while females constituted 18.8%. Regarding the level of education, most respondents have attained their masters' degree (38.3%), 26.6% have attained their postgraduate diploma, while 15.6% of the respondents have attained their bachelors or advanced diploma. Minority of the respondents have attained their diploma (9.1%), doctorate (7.8%) and advanced certificate (2.6%). In terms of work title, it was found that 22.1% of respondents are CAD designers, 16.9% are operational personnel, 16.2% are researchers, 11.7% are business developers while 11% are IT personnel, sales personnel and marketing officers respectively. Regarding firm category, 38.3% work in 3D printing consulting firms, 33.1% work in 3D software and related technology firms, 11% work in 3D printing design and tool making firms, 10.4% work in 3D machine supplier firms while 7.1% work in 3D machine reseller firms. For ethnic origin, it was found that 47.4% are Black South Africans, 18.8% belong to other Black African ethnic groups, 16.9% are White South Africans while 16.9% belong to the colored ethnic group. Regarding tenure, it was found that 49.4% have worked in their 3D printing firms for 4-6 years, 22.1% have worked in 3D printing firms for 7-10 years while 14.3% have worked in 3D printing firms for 1-3 years and more than 10 years respectively.

5.4 Descriptive Statistics

5.4.1 Descriptive statistics on leaders' emotional intelligence

Leader emotional intelligence was measured using eight (8) items using the Mayer and Salovey Model of Emotional intelligence and comprised of the following four dimensions: perceiving emotions (2-items), facilitating emotions (2-items), understanding emotions (2-items) and managing emotions (2-items). Minimum values of 1.00 and maximum values of 6.00 were attained for all the eight (8) items. Mean values ranged from 3.8117 to 4.6234 which gives an indication of high ratings leader emotional intelligence, since each of the mean scores were greater than the midpoint value of 3.50.

Table 5.2: Descriptive statistics on leaders' emotional intelligence

Perceiving Emotions	N	Minimum	Maximum	Mean
My manager is able to detect the positive/negative emotions of subordinates at the workplace	154	1.00	6.00	4.4091
My manager pays attention to emotional clues of subordinates such as moods, tone of voice, posture and facial expressions when interacting with them	154	1.00	6.00	4.3506
Facilitating Emotions	N	Minimum	Maximum	Mean
My manager is flexible and open-minded about subordinate emotions and behavior at the workplace	154	1.00	6.00	4.6234
My manager deals well with the emotional behaviours of subordinates at the workplace	154	1.00	6.00	4.1039

Understanding Emotions	N	Minimum	Maximum	Mean
My manager is able to analyze and judge the emotional expressions of subordinates correctly	154	1.00	6.00	4.0714
My manager has the ability to describe the emotions of subordinates in a detailed manner	154	1.00	6.00	3.8117
Managing Emotions	N	Minimum	Maximum	Mean
My manager is able to control his emotions when making decisions at the workplace.	154	1.00	6.00	4.5519
My manager is good handling the emotions of subordinates at the workplace	154	1.00	6.00	4.3182

5.4.2 Descriptive statistics on subordinates' emotional intelligence

Subordinates' emotional intelligence was also measuring using eight (8) items by utilizing the Mayer and Salovey Model of Emotional Intelligence. Subordinate's emotional intelligence was measured on four dimensions namely perceiving emotions (2-items), facilitating emotions (2-items), understanding emotions (2-items) and managing emotions (2-items). Out of the eight (8) items, five (5) items had minimum values of 1.00, two (2) items had minimum values of 3.00 while one (1) item had a minimum value of 4.00. However, maximum values of 6.00 was attained for all the eight (8) items. Mean values for each of the eight (8) items ranged from 4.3506 to 4.9935. The mean values for each of the eight (8) items was greater than the midpoint value of 3.50, which indicates that there were high ratings on subordinates' emotional intelligence in the 3D printing sector in South Africa.

Table 5.3: Descriptive statistics on subordinates' emotional intelligence

Perceiving emotions	N	Minimum	Maximum	Mean
I am able to detect the emotions of co-workers at the workplace	154	1.00	6.00	4.3506
I pay attention to emotional clues of co-workers such as mood, tone of voice, posture and facial expressions when interacting with them	154	1.00	6.00	4.7338
Facilitating emotions	N	Minimum	Maximum	Mean
I am flexible and open-minded about subordinate emotions and behavior at the workplace	154	4.00	6.00	4.9935
I cope well with the emotions exhibited by co-workers at the workplace	154	3.00	6.00	4.8312
Understanding emotions	N	Minimum	Maximum	Mean
I have good knowledge about emotions expressed by co-workers at the workplace	154	1.00	6.00	4.5325
I am able to analyze and judge the emotional expressions of co-workers correctly	154	1.00	6.00	4.5844
Managing emotions	N	Minimum	Maximum	Mean
I am able to control my emotions when making decisions at the workplace.	154	1.00	6.00	4.7468
I am good at handling the emotions of colleagues at the workplace	154	3.00	6.00	4.9481

5.4.3 Descriptive statistics on subordinates' job task performance

Subordinates' job task performance was measured using three dimensions namely task performance (5-items), contextual performance (6-items) and counterproductive work behaviors (6-items). For task performance, minimum values ranged from 3.00 to 4.00, while maximum values attained was 6.00. There were high ratings for task performance since mean scores were greater than 3.50 as they ranged between 4.7792 to 5.4026. On contextual performance, minimum values of 3.00 were attained for each of the six (6) items while maximum values of 6.00 was also achieved. The mean scores ranged from 4.8442 to 5.3506, indicating high ratings on the construct. For counterproductive work behaviors, five (5) items had minimum values of 1.00, while one (1) item had a minimum value of 3.00. Maximum values attained was 6.00 for each of the six (6) items. Four (4) items had mean scores that were less than the midpoint value of 3.50 indicating low ratings. However, two (2) items had mean scores that were greater than the midpoint value of 3.50, thereby indicating high ratings.

Table 5.4: Descriptive statistics on subordinates' job performance

Task Performance	N	Minimum	Maximum	Mean
I plan my work so that it was done on time.	154	3.00	6.00	4.7792
I keep in mind the results that I must achieve in my work.	154	3.00	6.00	5.1623
I can separate main issues from side issues at work.	154	4.00	6.00	5.1623
I can set the priorities when performing tasks	154	4.00	6.00	5.4026
I always perform my work well within time with minimal effort.	154	4.00	6.00	5.2273

Contextual Performance	N	Minimum	Maximum	Mean
I take on extra responsibilities at my workplace. That is, I do more than is expected of me.	154	3.00	6.00	5.3506
I start new tasks by myself, when my old ones were finished.	154	3.00	6.00	4.8442
I take on challenging work tasks, when available.	154	3.00	6.00	4.9416
I work at keeping my job knowledge up-to-date	154	3.00	6.00	4.8896
I come up with creative solutions to new problems.	154	3.00	6.00	5.1039
I keep looking for new challenges in my job.	154	3.00	6.00	5.0844
Counterproductive work behaviors	N	Minimum	Maximum	Mean
I sometimes complain about unimportant matters at work.	154	3.00	6.00	4.8831
I sometimes make problems greater than they were at work.	154	1.00	6.00	4.5714
I focus on the negative aspects of a work situation, instead of on the positive aspects.	154	1.00	6.00	2.7078
I speak with people from outside the organization about the negative aspects of my work.	154	1.00	6.00	2.1753
I sometimes do less than is expected of me.	154	1.00	6.00	2.0714
I sometimes do nothing, while I should have been working.	154	1.00	6.00	2.7662

5.4.4 Descriptive statistics on subordinates' job related behavior

Subordinates' job related behavior was measured using four dimensions namely vigor (4-items), dedication (4-items), absorption (3-items) and job attitudes (8-items). Vigor had minimum values of 1.00 and maximum values of 6.00. However, two (2-items) had mean scores that were less than 3.50 indicating low ratings, while the remaining two (2-items) had mean values that were greater than the midpoint value of 3.50, which indicated high ratings on those two (2) items. For dedication, three (3) items had minimum values of 1.00 while one (1) item had a minimum value of 3.00. However, all the four (4) items had maximum values of 6.00. There were high ratings on subordinates' dedication as mean values attained were greater than the midpoint value of 3.50. On absorption, all the three (3) items had minimum values of 1.00 and maximum values of 6.00. There were high ratings on the construct absorption since mean values were greater than the midpoint value of 3.50. Job attitudes also had minimum values of 1.00 and maximum values of 6.00 respectively. Each of the mean values for the items used for measuring job attitudes were greater than the midpoint value of 3.50, which is an indication of high ratings on the construct.

Table 5.5: Descriptive statistics on subordinate Job related behaviors

Vigor	N	Minimum	Maximum	Mean
I always feel strong and vigorous at my work	154	1.00	6.00	1.9545
When I get up in the morning, I feel like going to work	154	1.00	6.00	1.8052
At work, I continuously work for very long periods at a time	154	1.00	6.00	4.6039
At my work I always persevere, even when things do not go well	154	1.00	6.00	4.2987
Dedication	N	Minimum	Maximum	Mean

I find the work that I do full of meaning and purpose	154	1.00	6.00	3.8766
I am enthusiastic about my job	154	3.00	6.00	5.2013
My job inspires me	154	1.00	6.00	4.8052
I am proud on the work that I do	154	1.00	6.00	4.7013
Absorption	N	Minimum	Maximum	Mean
It seems like time flies when I'm working	154	1.00	6.00	4.6104
When I am working, I forget everything else around me	154	1.00	6.00	4.7922
I get carried away when I'm working	154	1.00	6.00	4.7987
Job Attitudes	N	Minimum	Maximum	Mean
I have received training to do my job better	154	1.00	6.00	4.2013
I have the right tools and equipment to do my job	154	1.00	6.00	4.0065
I think I am paid the right amount of money for the work I do	154	1.00	6.00	4.4091
I think my firm cares about me as a person as well as an employee	154	1.00	6.00	4.3506
I think in general, morale in the business is high	154	1.00	6.00	3.6299
I like my work	154	1.00	6.00	4.2143
I am doing my work not because I love but only because I need the money	154	1.00	6.00	4.3247
If I get another job, I will leave the current one	154	1.00	6.00	5.0130

I am not sure how the responses were aggregated for the leaders and the subordinates in the Tables above.

5.5 Results on structural equation modelling

5.5.1 Construct validity

Construct validity in structural equation modelling defines the extent to which the observed indicators are appropriate for measuring their related underlying constructs or latent variables (Flake et al., 2022). Factor loadings are being used to assess the construct validity of items used for measuring latent variables (Flake et al., 2022). Factor loadings that are greater than 0.5 provides an indication of meeting the construct validity benchmark (Mathieu et al., 2020). According to results from table 5.4, construct validity was achieved for the latent variables used in the model as follows: Leader emotional intelligence, 5-items, FL=0.768 to 0.896), Subordinate emotional intelligence (5-items, FL=0.606 to 0.833), Subordinate job task performance (10-items, FL=0.549 to 0.857) and Subordinate job behavior (8-items, FL=0.527 to 0.864).

Table 5.4: Construct Validity

Valid items	Factor loadings
Q8 <- leader emotional intelligence	0.808
Q10 <- leader emotional intelligence	0.884
Q12 <- leader emotional intelligence	0.896
Q13 <- leader emotional intelligence	0.862

Q14 <- leader emotional intelligence	0.768
Q16 <- subordinate emotional intelligence	0.712
Q18 <- subordinate emotional intelligence	0.702
Q19 <- subordinate emotional intelligence	0.649
Q20 <- subordinate emotional intelligence	0.833
Q21 <- subordinate emotional intelligence	0.730
Q22 <- subordinate emotional intelligence	0.606
Q24 <- Subordinate job task performance	0.749
Q25 <- Subordinate job task performance	0.857
Q26 <- Subordinate job task performance	0.686
Q27 <- Subordinate job task performance	0.752
Q28 <- Subordinate job task performance	0.692
Q30 <- Subordinate job task performance	0.549
Q31 <- Subordinate job task performance	0.624
Q32 <- Subordinate job task performance	0.776
Q33 <- Subordinate job task performance	0.770
Q34 <- Subordinate job task performance	0.604
Q44 <- Subordinate job behaviour	0.895
Q46 <- Subordinate job behaviour	0.553

Q47 <- Subordinate job behaviour	0.864
Q48 <- Subordinate job behaviour	0.829
Q51 <- Subordinate job behaviour	0.557
Q54 <- Subordinate job behaviour	0.668
Q55 <- Subordinate job behaviour	0.752
Q56 <- Subordinate job behaviour	0.527
Q57 <- Subordinate job behaviour	0.830

5.5.2 Convergent validity and reliability

Convergent validity is a validity assessment method that explores the positive relationship between multiple measures of the same construct. It is commonly evaluated by calculating the average variance extracted (AVE) for each construct. The AVE quantifies the proportion of variance in the observed indicators that can be explained by the construct. A generally accepted guideline for AVE suggests that a value of 0.5 or higher indicates good convergent validity (Fornell & Larcker, 1981; Hair, Black, Babin, & Anderson, 2010). In our study, the AVE values obtained for the variables were as follows: leader emotional intelligence = 0.712, subordinate emotional intelligence = 0.502, subordinate job-task performance = 0.526, and subordinate job behavior = 0.537. These results indicate that convergent validity was successfully established for all variables used in the structural equation model (SEM).

Reliability measures the internal consistency of the scale items used to measure constructs. In SEM, Cronbach's alpha and composite Cronbach's alpha are employed as reliability measures. According to Hair et al. (2010), a Cronbach's

alpha and composite Cronbach's alpha value greater than 0.7 indicates satisfactory reliability for variables. Upon examining the results presented in Table 5.5, it can be inferred that reliability was achieved for all the variables used in the SEM, as their Cronbach's alpha and composite Cronbach's alpha values exceeded the threshold of 0.7.

Table 5.5 Convergent validity and reliability

	Cronbach's alpha	Composite reliability (rho_a)	Average variance extracted (AVE)
Subordinate job behaviour	0.886	0.903	0.537
Subordinate job task performance	0.892	0.923	0.506
leader emotional intelligence	0.899	0.904	0.714
subordinate emotional intelligence	0.803	0.821	0.502

5.5.3 Discriminant validity

Discriminant validity examines the extent to which a measurement is distinct from other unrelated measurements. It evaluates the degree to which measures of different constructs are not strongly correlated with each other. The Fornell-Larcker criterion is a commonly used method in structural equation modeling to assess discriminant validity. It compares the square root of the average variance extracted (AVE) for each construct to the correlations among the constructs. Discriminant validity is considered to be established if the square root of the AVE for each

construct is greater than the correlation between that construct and any other construct (Fornell & Larcker, 1981).

Based on the findings presented in Table 5.6, the analysis confirms the achievement of discriminant validity. This is evidenced by the fact that the square root of the AVE for each variable is greater than the correlation between that variable and any other variable. In other words, the measures for each construct are distinct and not highly correlated with measures from unrelated constructs (leader emotional intelligence, subordinate emotional intelligence, subordinate job behavior and subordinate job performance) were greater than the correlation between each construct and any other construct.

Table 5.6 Fornell-Larcker Criterion

	Subordinate job behaviour	Subordinate job task performance	leader emotional intelligence	subordinate emotional intelligence
Subordinate job behaviour	0.733			
Subordinate job task performance	0.560	0.711		
leader emotional intelligence	0.821	0.412	0.845	
subordinate emotional intelligence	0.648	0.637	0.639	0.709

5.5.4 Collinearity statistics

Multicollinearity is a statistical phenomenon that arises when there is a high correlation between two or more predictor variables, resulting in challenges to differentiate the unique impacts of each predictor on the outcome variable. One widely employed measure to assess multicollinearity is the utilisation of Variance Inflation Factor (VIF). The general guideline for interpreting VIF values suggests that a VIF value exceeding 10 indicates the presence of noteworthy multicollinearity. From table 5.7, there was no incidence of multicollinearity since VIF values of valid items used in the structural equation modelling was less than 10.

Table 5.7 Collinearity statistics

	VIF
Q10	2.902
Q12	4.070
Q13	2.574
Q14	1.858
Q16	1.589
Q18	2.396
Q19	2.671
Q20	2.135
Q21	2.175

Q22	1.965
Q24	1.903
Q25	6.718
Q26	4.548
Q27	5.870
Q28	4.378
Q30	1.740
Q31	2.094
Q32	2.518
Q33	2.778
Q34	1.994
Q44	7.134
Q46	2.974
Q47	7.627
Q48	5.055
Q51	3.110
Q54	3.130
Q55	3.548
Q56	1.615

Q57	3.056
Q8	2.691

5.5.5 R-square and adjusted R²

In Structural Equation Modeling (SEM), R-square and adjusted R-square are measures of how well a model fits the data. The R-square measures the proportion of variance in the dependent variable that can be explained by the independent variables in the model. The adjusted R-square is a modified version of the R-square that takes into account the number of independent variables in the model. According to the r-square value of 0.705, it could be rightly inferred that 70.5% of the variation in employee job performance could be explained by leader emotional intelligence in the 3D printing sector in South Africa. However, the r-square value of 0.513 gives the indication that 51.3% of the variation in subordinate job task performance is explained by leader emotional intelligence in the 3D printing sector in South Africa. The r-square value of 0.408 implies that 40.8% of the variation in subordinate emotional intelligence is explained by leader emotional intelligence in the 3D printing sector in South Africa.

Table 5.8: Model fitness

Model fit	R-square	R-square adjusted
Subordinate job behaviour	0.705	0.699
Subordinate job task performance	0.513	0.493

subordinate emotional intelligence	0.408	0.404
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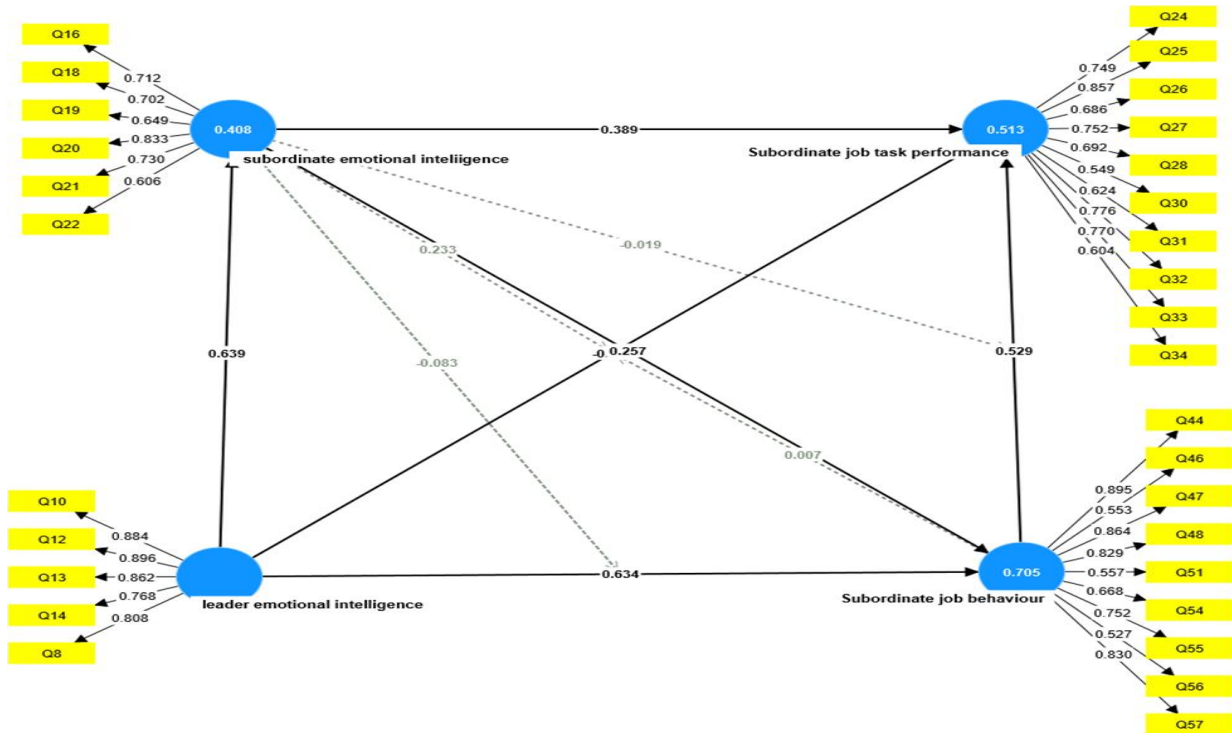


Figure 5.1: PLS-Structural Equation Modelling

5.5.6 Hypotheses testing and discussion of results

In this section the hypotheses proposed are being tested for both direct effects and indirect (moderating) effects. Decisions were being taken as to whether hypotheses tested were supported or not supported. Furthermore, the results based on the research hypotheses were discussed in line with relevant literature.

Table 5.9 Testing of hypotheses

Hypotheses	B-value	t-statistic	p-value	Decision
H1: leader emotional intelligence -> Subordinate job task performance	-0.208	1.560	0.119	Not supported
H2: leader emotional intelligence -> Subordinate job behaviour	0.907	24.127	0.000	Supported
H3: subordinate emotional intelligence -> Subordinate job task performance	0.689	8.444	0.000	Supported
H4: subordinate emotional intelligence -> Subordinate job behaviour	-0.063	1.365	0.172	Not supported
H5: Subordinate job behaviour -> Subordinate job task performance	0.398	2.891	0.004	Supported
H6: Subordinate job behaviour x leader emotional intelligence -> Subordinate job task performance	0.128	1.987	0.047	Supported
H7: Subordinate emotional intelligence x leader emotional intelligence -> Subordinate job task performance	-0.224	1.948	0.051	Not supported
H8: Subordinate emotional intelligence x leader emotional intelligence -> Subordinate job behaviour	0.037	0.904	0.366	Not supported

H9: Subordinate emotional intelligence x Subordinate job behaviour -> Subordinate job task performance	0.220	1.027	0.305	Not Supported
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5.5.6.1 Impact of leader emotional intelligence on subordinate job-task performance

A non-significant negative relationship was found to exist between leader emotional intelligence and subordinate job task performance ($B=-0.208$, $p=0.119$). Hypothesis 1 was therefore not supported. This result contradicts the findings of Bambole, Kassim, and Musa (2016), who reported a significant positive connection between leaders' emotional intelligence and employee job performance. The finding of the study also contradicts the Alheet and Hamdan (2021) in the Jordanian retail industry, which reported a significant positive association between leaders' emotional intelligence and employee job performance. These results suggest that the relationship between emotional intelligence and job performance may be context-specific and may vary across industries and cultures. The nature of the job and the cultural values of the organization may influence how emotional intelligence affects job performance.

5.5.6.2 Impact of leader emotional intelligence on subordinate job-related behaviours

A significant positive relationship was found to exist between leader emotional intelligence and subordinate job behavior ($B=0.907$, $p=0.000$). Hypothesis 2 was therefore supported. The results of the two studies by Dartey-Baah and Mekpor (2017) and Shrestha and Baniya (2016) support the hypothesis that there is a

significant positive relationship between leader emotional intelligence and subordinate job behavior, specifically in terms of organizational citizenship behaviors (OCBs) in the Ghanaian banking sector and employee outcomes in public and private organizations in Nepal. Leaders who possess high emotional intelligence are able to understand and manage their own emotions, as well as recognize and respond to the emotions of others. This ability can lead to better relationships between leaders and subordinates, increased trust and communication, and a more positive work environment.

5.5.6.3 Subordinate emotional intelligence on subordinate job-task performance

A significant positive relationship was found to exist between subordinate emotional intelligence and subordinate job task performance ($B=0.689$, $p=0.000$). Hypothesis 3 was supported. The findings of the study were consistent with previous studies. For instance, Akhtar, Ghufra, Husnain and Shahid (2017) assessed the effect of emotional intelligence on employee's job performance with perceived organizational support as a moderating variable. The study found that a significant positive association exists between employees' emotional intelligence and employee job performance. Gunu and Oladepo (2014) assessed the impact of employees' emotional intelligence on employee commitment and performance among manufacturing firms in Nigeria. The results of the study showed that a significant positive connection between employees' emotional intelligence and employee commitment and also employees' job performance. Rexhepi and Berisha (2017) assessed the effect of employees' emotional intelligence on employee job performance among private and public institutions in Macedonia. The results of the study showed that employees emotional intelligence positively influenced their job performance.

5.5.6.4 Subordinate emotional intelligence on subordinate job related behaviour

The study found that a non-significant negative relationship exists between subordinate emotional intelligence and subordinate job behavior among 3D printing firms ($B=-0.063$, $p=0.172$). Hypothesis 4 was therefore not supported. The findings of the study were not consistent with literature. This is because, previous studies have shown that positive relationships exist between leaders' emotional intelligence and subordinate's job related behaviours (Batool, 2013). Employees with high emotional intelligence levels exhibit positive job-related behaviour such as commitment, punctuality, and positive attitudes towards work and decrease stress associated with their work (Bahl, 2016; Cekmecioğlu et al., 2012). Sarangi and Vats (2015) conducted a study to examine the impact of employees' emotional intelligence on employee engagement among Indian professionals. The results found that employees who are emotionally intelligence of employees contributes positively to the exhibition of job related behaviour in terms of vigor, dedication and absorption.

5.5.6.5 Impact of subordinate job related behaviours on subordinate job-task performance

The results of the study indicated that a significant positive relationship exists between subordinate job behavior and subordinate job task performance ($B=0.398$, $p=0.004$). Hypothesis 5 was supported. The finding was consistent with previous literature which have also shown that significant positive relationships exist between subordinates' job-related behaviour and job task performance. For instance, a study by Cekmecioğlu et al. (2012) found that job performance was positively related to employee job behavior, and that job behavior was a significant

predictor of job performance. Additionally, a study by Bahl (2016) found that job performance was influenced by job behavior, with job behavior significantly predicting job performance. Another study by Arshad et al. (2015) also found a significant positive relationship between job behavior and job performance.

5.5.6.6 Moderating role of subordinate job related behaviours on the relationship between leader emotional intelligence and subordinate job-task performance

The study found that subordinate job behavior moderated the relationship between leader emotional intelligence and subordinate job task performance ($B=0.128$, $p=0.047$). Hypothesis 6 was supported. The finding of the study suggests that the relationship between leader emotional intelligence and subordinate job task performance is stronger when there is positive job behavior among subordinates. This is consistent with the notion that positive workplace behavior can enhance the effects of leadership on employee job task performance (Shrestha & Baniya, 2016). In a study by Cekmecioğlu et al. (2012), it was found that the relationship between leader emotional intelligence and employee performance was stronger when employees had high levels of organizational citizenship behavior. This suggests that the effectiveness of a leader's emotional intelligence is dependent on the behavior of subordinates (Dartey-Baah & Mekpor, 2017; Dongping & Ghauri, 2014).

5.5.6.7 Moderating effect of subordinate emotional intelligence on the relationship between leader emotional intelligence and subordinate job-task performance

From the results, subordinate emotional intelligence did not significantly moderate the relationship between leader emotional intelligence and subordinate job task performance ($B=-0.223$, $p=0.051$). Hypothesis 7 was not supported. The finding that subordinate emotional intelligence did not significantly moderate the relationship between leader emotional intelligence and subordinate job behavior is interesting and can be discussed in light of relevant literature. While some studies have found that subordinate emotional intelligence can moderate the relationship between leader emotional intelligence and job outcomes (e.g., Kim & Yoon, 2018; Parke, Seo, Sherf, & Regner, 2015), other studies have found no significant moderating effect (e.g., Al-Awar & Yusoff, 2019; Salovey & Mayer, 2016). In fact, a meta-analysis conducted by Karimi, Leggat, Donohue, and Cooper (2019) found that the moderating effect of subordinate emotional intelligence on the relationship between leader emotional intelligence and job outcomes was small and inconsistent. One possible explanation for the non-significant moderating effect of subordinate emotional intelligence in this study could be the specific context or industry being studied. Different industries and organizations may have different norms and expectations for emotional intelligence, which could affect the impact of emotional intelligence on job outcomes and the extent to which it moderates the relationship between leader emotional intelligence and subordinate job behavior.

5.5.6.8 Moderating effect of subordinate emotional intelligence on the relationship between leader emotional intelligence and subordinate job-related behaviours

According to the results, subordinate emotional intelligence did not significantly moderate the relationship between leader emotional intelligence and subordinate job behaviour ($B=0.037$, $p=0.366$). Hypothesis 8 was not supported. The finding that subordinate emotional intelligence did not significantly moderate the relationship between leader emotional intelligence and subordinate job behavior is in line with some previous studies. For example, in a study conducted by Hu, Huang, and Zhang (2019) among Chinese healthcare workers, it was found that subordinate emotional intelligence did not moderate the relationship between leader emotional intelligence and employee work outcomes such as job satisfaction and organizational commitment. Similarly, a study by Özdemir and Acar (2018) found that subordinate emotional intelligence did not significantly moderate the relationship between leader emotional intelligence and employee job satisfaction in a Turkish public organization. These findings suggest that while emotional intelligence may be an important factor in individual and organizational outcomes, it may not necessarily have a moderating effect on the relationship between leader emotional intelligence and employee behavior or job outcomes.

5.5.6.9 Moderating effect of subordinate emotional intelligence on the relationship between subordinate job-related behaviours and subordinate job-task performance

According to the results, subordinate emotional intelligence did not significantly moderate the relationship between subordinate job behavior and subordinate job task performance ($B=0.220$, $p=0.305$). Hypothesis 9 was not supported.

The finding that subordinate emotional intelligence did not significantly moderate the relationship between subordinate job behavior and subordinate job task performance is consistent with some previous studies. For example, a study by Wang et al. (2017) found that the relationship between employee job behavior and job performance was not moderated by employee emotional intelligence. Similarly, a study by Khalid et al. (2020) found that the relationship between employee job behavior and job performance was not moderated by employee emotional intelligence in the context of the healthcare industry.

However, there are also studies that suggest that emotional intelligence may play a moderating role in the relationship between job behavior and job performance. For example, a study by Beigi et al. (2020) found that emotional intelligence moderated the relationship between job crafting and job performance, such that the relationship was stronger for employees with higher emotional intelligence. Similarly, a study by Kim et al. (2019) found that emotional intelligence moderated the relationship between organizational citizenship behavior and job performance, such that the relationship was stronger for employees with higher emotional intelligence.

5.6 Chapter summary

This chapter presented the results of the study and also discussed findings in line with relevant literature. The next chapter therefore provides conclusions and recommendations based on the results of the study.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This study examined the direct and indirect (moderating) relationships between leader emotional intelligence, subordinate emotional intelligence, employee job task performance and employee job related behaviors among 3D printing production floor workers in South Africa. The study was guided by nine hypotheses. Out of these nine (9) hypotheses, four (4) were supported while five (5) of the hypotheses were not supported. This chapter therefore provides the conclusions and recommendations based on the results of the study. The chapter also provides suggestions for future researchers on the subject matter.

6.2 Conclusions

This section provides conclusions based on the hypotheses of the study in the following sub-sections:

6.2.1 Conclusions based on hypothesis one

The first hypothesis was not supported since there was no significant relationship between leader emotional intelligence and subordinate job task performance. The study therefore concludes that having a leader with higher emotional intelligence does not necessarily translate into better job performance by production floor workers of 3D printing firms in South Africa.

6.2.2 Conclusions based on hypothesis two

The second hypothesis was supported. This is because, a significant positive relationship was found between leader emotional intelligence and subordinate job behavior. The study concludes that leaders with higher emotional intelligence are better able to influence their subordinates' behavior in a positive way, in terms of vigor, dedication, absorption and job attitudes.

6.2.3 Conclusions based on hypothesis three

Hypothesis three was supported since a significant positive relationship was found to exist between subordinate emotional intelligence and subordinate job task performance. The study therefore concludes that, subordinates with high levels of emotional intelligence are able to perform better on their jobs than those with low levels of emotional intelligence in the 3D printing sector in South Africa.

6.2.4 Conclusions based on hypothesis four

Hypothesis four was not supported. This is because, the results showed that subordinate emotional intelligence and subordinate job behavior are not positively correlated. The study therefore concludes that, having high levels of emotional intelligence, does not contribute to better subordinate job behaviors in terms of vigor, dedication, absorption and job attitudes among 3D printing production floor workers.

6.2.5 Conclusions based on hypothesis five

The fifth hypothesis was supported. This is because, the results indicated that a significant positive connection exist between subordinate job behavior and

subordinate job task performance. In this regard, the study concludes that, increases in job behaviors of subordinates such as vigor, dedication and absorption, leads to improved subordinate job task performance among 3D printing production floor workers.

6.2.6 Conclusions based on hypothesis six

Hypothesis six was supported because, subordinate job behavior positively moderated the relationship between leader emotional intelligence and subordinate job task performance. In this regard, the study concludes that, promoting positive job behaviors such as vigor, dedication, absorption and job attitudes, strengthens the relationship between leader emotional intelligence and subordinate job task performance.

6.2.7 Conclusions based on hypothesis seven

The seventh hypothesis was found to be unsupported as the moderation effect of subordinate emotional intelligence on the relationship between leader emotional intelligence and subordinate job task performance was not achieved. The study concludes that there is no significant impact of subordinate emotional intelligence on the relationship between leader emotional intelligence and subordinate job task performance among 3D printing production floor workers.

6.2.8 Conclusions based on hypothesis 8

Hypothesis 8 was not supported. This is because, the level of emotional intelligence among subordinates did not have a moderating effect on the relationship between the emotional intelligence of leaders and the job behaviour of subordinates. Based on the analysis, it can be concluded that the emotional intelligence of subordinates

does not have a significant impact on the relationship between the emotional intelligence of leaders and the job behaviour of subordinates in the context of 3D printing production floor workers.

6.2.9 Conclusions based on hypothesis 9

The ninth hypothesis was not supported since subordinate emotional intelligence did not moderate the relationship between subordinate job behavior and subordinate job task performance. The study concludes that, subordinate emotional intelligence did not strengthen or dampen the relationship between subordinate job behaviour and subordinate job task performance.

6.3 Practical Recommendations

Based on the finding of the study and the conclusions that were derived, the following recommendations are provided.

Firstly, since the study found that significant positive relationships exist between leader emotional intelligence and subordinate job behaviour, as well as subordinate emotional intelligence and subordinate job task performance, it is important for training programs on emotional intelligence to be intensified among 3D printing firms leaders and subordinates. Training on emotional intelligence will equip leaders and subordinates with the requisite skills on emotional intelligence that will enable them to positively enhance job behaviors such as vigor, dedication, absorption and job attitudes as well as job task performance.

Secondly, since the study found that positive relationships exist between subordinate job behavior and subordinate job task performance, the study recommends the need for 3D printing firms to engage in activities and programs

that will continually foster positive job behaviors among employees. For instance, 3D printing firms can improve on their remuneration and compensation packages for employees to enhance positive job behaviors in terms of vigor, dedication and absorptions, which will also contribute to positive job task performance.

Thirdly, since the study found that subordinate emotional intelligence positively enhance subordinate job task performance, the study recommends the need for 3D printing firms to consider making emotional intelligence as part of their criteria for recruiting people into their firms as employees. In this regard, emotional intelligence assessment tests could become part of the recruitment process for new positions in 3D printing firms.

Finally, since subordinate emotional intelligence is positively associated with subordinate job task performance, it is important for 3D printing firms to encourage improvements in job task performance of employees by introducing performance based rewards such as bonuses, promotions and other incentives that will motivate employees to give off their best.

6.4 Suggestions for future studies

From the findings of the study and conclusions derived, the following are recommended for future studies.

Firstly, in as much as this study found that subordinate job behavior moderated the relationship, there may be other factors that have not been considered. Future studies could explore the role of factors such as organizational culture, job design, and communication patterns in moderating this relationship.

Secondly, this study only measured emotional intelligence and job performance at one point in time. A longitudinal study could help determine if emotional intelligence is a predictor of job performance over time and if the relationship between the two changes as subordinates gain more experience and skills.

Thirdly, this study highlights the importance of emotional intelligence in predicting job performance. Future studies could explore the impact of emotional intelligence training programs on job performance, particularly in the 3D printing sector.

Finally, this study focused on emotional intelligence and job performance and job behavior in the 3D printing sector. Future studies could explore if emotional intelligence levels and their relationship with job performance and job behavior differ in other industries such as higher education institutions, health sector, hospitality sector among others. Such a comparison could help identify industry-specific factors that influence the relationship between emotional intelligence, job performance and job behavior among leaders and subordinates.

6.5 Chapter summary

This chapter provided the conclusions of the study as well as the practical recommendations and directions for future studies. The study needs to have proper summary and conclusion and not just the chapter which is even too brief.

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APPENDIX

QUESTIONNAIRE FOR DATA COLLECTION

Dear respondent my name is Thabang Mokoka. I am a Masters student from the Central University of Technology (CUT) in the Free State Province, South Africa. My supervisor is Professor Dennis Yao Dzansi is from the same university.

I am researching on the topic: Impact of emotional intelligence on selected work-related behaviours and job task performance of subordinate production floor workers in the South African 3D printing industry. I would be very grateful for your assistance in completing the questions below.

Kindly please read the statements carefully and mark **x** the number that corresponds to your choice. The study is entirely for academic purpose, hence any information provided would be considered valuable and confidential. It is hoped that you would be as candid as possible.

Thank you.

SECTION A: DEMOGRAPHIC DATA								
1.	Your age (in years)							
2.	Your gender	1 Male				2 Female		
3.	Your highest qualification	1 Advanced Certificate	2 Diploma	3 Bachelors/ AdvDiploma	4 Honours/ PGDiploma	4 Masters	5 Doctorate	6 Other (specify)
4.	State the work you do in the firm							

5.	Which category best describes your current 3D printing firm	1 3D Machine Reseller	2 3D Material Supplier	3 Consulting	4 3D Software & related Technologies	5 Design and Tool Making	6 Other (specify)
6.	Please indicate your ethnic origin	1 Black South African	2 Other Black African	3 White South African	4 Indian/Asian	5 Coloured	6 Other (specify)
7.	Please indicate the number of years you have been in 3D printing						

Leader Emotional Intelligence								
8.	My manager is able to detect the positive/negative emotions of subordinates at the workplace	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
9.	My manager pays attention to emotional clues of subordinates such as moods, tone of voice, posture and facial expressions when interacting with them	[1]	[2]	[3]	[4]	[5]	[6]	
Leader Emotional Intelligence (Facilitating emotions)								

10.	My manager is flexible and open-minded about subordinate emotions and behavior at the workplace	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
11.	My manager deals well with the emotional behaviours of subordinates at the workplace	[1]	[2]	[3]	[4]	[5]	[6]	
Leader Emotional Intelligence (Understanding emotions)								
12.	My manager is able to analyze and judge the emotional expressions of subordinates correctly	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
13.	My manager has the ability to describe the emotions of subordinates in a detailed manner	[1]	[2]	[3]	[4]	[5]	[6]	
Leader Emotional Intelligence (Managing emotions)								
14.	My manager is able to control his emotions when making decisions at the workplace.	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	

15.	My manager is good handling the emotions of subordinates at the workplace	[1]	[2]	[3]	[4]	[5]	[6]	
Subordinate's Emotional Intelligence (Perceiving emotions)								
16.	I am able to detect the emotions of co-workers at the workplace	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
17.	I pay attention to emotional clues of co-workers such as mood, tone of voice, posture and facial expressions when interacting with them	[1]	[2]	[3]	[4]	[5]	[6]	
Subordinate's Emotional Intelligence (Facilitating emotions)								
18.	I am flexible and open-minded about subordinate emotions and behavior at the workplace	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
19.	I cope well with the emotions exhibited by co-workers at the workplace	[1]	[2]	[3]	[4]	[5]	[6]	

Subordinate's Emotional Intelligence							
(Understanding emotions)							
20.	I have good knowledge about emotions expressed by co-workers at the workplace	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree
21.	I am able to analyze and judge the emotional expressions of co-workers correctly	[1]	[2]	[3]	[4]	[5]	[6]
Subordinate's Emotional Intelligence							
(Managing emotions)							
22.	I am able to control my emotions when making decisions at the workplace.	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree
23.	I am good at handling the emotions of colleagues at the workplace	[1]	[2]	[3]	[4]	[5]	[6]
Employee Job Performance							
Task Performance							
24.	I plan my work so that it was done on time.	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree

25.	I keep in mind the results that I must achieve in my work.	[1]	[2]	[3]	[4]	[5]	[6]	
26.	I can separate main issues from side issues at work.	[1]	[2]	[3]	[4]	[5]	[6]	
27.	I can set the priorities when performing tasks	[1]	[2]	[3]	[4]	[5]	[6]	
28.	I always perform my work well within time with minimal effort.	[1]	[2]	[3]	[4]	[5]	[6]	
Contextual Performance								
29.	I take on extra responsibilities at my workplace. That is, I do more than is expected of me.	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
30.	I start new tasks by myself, when my old ones were finished.	[1]	[2]	[3]	[4]	[5]	[6]	
31.	I take on challenging work tasks, when available.	[1]	[2]	[3]	[4]	[5]	[6]	
32.	I work at keeping my job knowledge up-to-date	[1]	[2]	[3]	[4]	[5]	[6]	
33.	I come up with creative solutions to new problems.	[1]	[2]	[3]	[4]	[5]	[6]	
34.	I keep looking for new challenges in my job.	[1]	[2]	[3]	[4]	[5]	[6]	

Counterproductive behaviours							
35.	I sometimes complain about unimportant matters at work.	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree
36.	I sometimes make problems greater than they were at work.	[1]	[2]	[3]	[4]	[5]	[6]
37.	I focus on the negative aspects of a work situation, instead of on the positive aspects.	[1]	[2]	[3]	[4]	[5]	[6]
38.	I speak with people from outside the organization about the negative aspects of my work.	[1]	[2]	[3]	[4]	[5]	[6]
39.	I sometimes do less than is expected of me.	[1]	[2]	[3]	[4]	[5]	[6]
40.	I sometimes do nothing, while I should have been working.	[1]	[2]	[3]	[4]	[5]	[6]
Subordinate Job related behaviours (Employee engagement)							
Vigor							
41.	I always feel strong and vigorous at my work	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree

42.	When I get up in the morning, I feel like going to work	[1]	[2]	[3]	[4]	[5]	[6]	
43.	At work, I continuously work for very long periods at a time	[1]	[2]	[3]	[4]	[5]	[6]	
44.	At my work I always persevere, even when things do not go well	[1]	[2]	[3]	[4]	[5]	[6]	
Dedication								
45.	I find the work that I do full of meaning and purpose	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
46.	I am enthusiastic about my job	[1]	[2]	[3]	[4]	[5]	[6]	
47.	My job inspires me	[1]	[2]	[3]	[4]	[5]	[6]	
48.	I am proud on the work that I do	[1]	[2]	[3]	[4]	[5]	[6]	
Absorption								
49.	It seems like time flies when I'm working	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	5 Agree	6 Strongly Agree	
50.	When I am working, I forget everything else around me	[1]	[2]	[3]	[4]	[5]	[6]	
51.	I get carried away when I'm working	[1]	[2]	[3]	[4]	[5]	[6]	

Employee Attitudes								
		1	2	3	4	5	6	
		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree	
52.	I have received training to do my job better							
53.	I have the right tools and equipment to do my job	[1]	[2]	[3]	[4]	[5]	[6]	
54.	I think I am paid the right amount of money for the work I do	[1]	[2]	[3]	[4]	[5]	[6]	
55.	I think my firm cares about me as a person as well as an employee	[1]	[2]	[3]	[4]	[5]	[6]	
56.	I think in general, morale in this business is high.	[1]	[2]	[3]	[4]	[5]	[6]	
57.	I like my work	[1]	[2]	[3]	[4]	[5]	[6]	
58.	I am doing my work not because I love it but only because I need the money	[1]	[2]	[3]	[4]	[5]	[6]	
59.	If I get another job, I will leave the current one	[1]	[2]	[3]	[4]	[5]	[6]	

Thank you