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KWAZULU-NATAL

INYUVESI
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**An exploratory study of total quality management challenges during
coronavirus disease: A case of Durban textile companies**

by

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Declaration

I, Khulani Mbele, declare that:

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Dedication

This dissertation is dedicated to my late Grandma, Ncaneleni Sokhela. She always supported me from undergraduate studies until Honours studies. I was young in 2017 when it was my first year being at the University, and she believed that I could do it without taking a gap year. Unfortunately, she did not get a chance to celebrate my success. I believe that wherever she is, she is still with me and gives me more strength in this life journey, and I want to proceed to the Ph.D. level in the year 2022.

Abstract

This research focused on Total Quality Management (TQM) as an operations challenge in the textile manufacturing sector during the era of Coronavirus disease 2019 (COVID-19), with the focus on textile manufacturing sector companies. South African textile companies based in Durban, KwaZulu-Natal, include Best Branding South Africa (BBSA) and Textiles Express (TE) were selected for the study.

TQM is a philosophy that seeks to integrate all organisational functions such as marketing, finance, supply chain, and engineering, as well as production, and customer service, to focus on meeting customer needs and company objectives. Customer satisfaction is the main driving force in TQM and involves top management.

One of the biggest challenges in the textile manufacturing sector is that COVID-19 has severely affected TQM operations. Some of the operational challenges include, but are not limited to such as, machine failures, materials, and rejects. The COVID-19 pandemic had an immediate effect on textile sales, trade, and production. TQM operational challenges include shutting down business operations, the decline in revenues, and a reduction in production.

The main study aim was to determine the COVID-19 pandemic impact on TQM within the textile manufacturing sector. The objectives of the study include: determining operations challenges faced in TQM attributable to COVID-19, regarding planning at the two textile companies, BBSA and TE. Second, to examine strategies employed in the textile manufacturing sector by BBSA and TE to solve these TQM operations challenges. Third, to explore which strategies were used by BBSA and TE to assess the COVID-19 impact on TQM. Last, to determine mitigation measures BBSA and TE employed to alleviate TQM operations challenges during the era of COVID-19.

Exploratory research design was employed to obtain more information on the current textile manufacturing industry status and evaluate the COVID-19 impact on TQM. A qualitative approach was used to collect primary data through interviews. Seven employees were selected from BBSA to participate, with eight employees selected from TE. Collected data were captured and analysed through thematic analysis, using NVivo version 12.

The research findings from in-depth interviews revealed serious challenges in the textile industry due to the COVID-19 pandemic. Some of the identified challenges at BBSA include disruption of operations, reduction in sales, and delays in orders. At TE the challenges during COVID-19 include inadequate training of employees, lack of resources, and ineffective communication.

The study recommends textile companies stay informed regarding the COVID-19 situation; this will assist in making informed decisions about business operations, while also securing cash flow, such as having a contingency budget in place.

Keywords: Total Quality Management, operations and supply chain management, COVID-19, PDCA cycle

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Glossary of Acronyms and Abbreviations

BBSA	Best Branding South Africa
GDP	Gross Domestic Product
OSHA	Occupational Safety and Health Administration
PDCA	Plan, do, check, act
SA	South Africa
SCM	Supply Chain Management
TE	Textiles Express
TQM	Total Quality Management
UKZN	University of KwaZulu-Natal

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

This research focused on Total Quality Management (TQM) as an operations challenge in the textile manufacturing sector during the era of COVID-19. Customer satisfaction is the main driving force in TQM because everyone in the company from top management to entry level employees, must be involved. The manufacturing sector requires processing, designing, and preparing goods from raw materials to commodities. It includes textiles, automobiles, food and beverages, as well as chemicals, electronics, and machinery.

This study focused on companies within the textile manufacturing sector that produce home textiles, lifestyle textiles, and other finished products. South African textile manufacturing companies face immense challenges in this time of COVID-19 and therefore need to maintain standards and production goals. Such companies are based in Durban, KwaZulu-Natal (KZN), and include Best Branding South Africa (BBSA) and Textiles Express (TE), among others. In the textile industry, there are macro and micro enterprises. At micro-scale, a significant expansion has been experienced in online and e-commerce activities, due to COVID-19 regulations, including those prohibiting travel and social contact.

1.2 Background of the study

TQM is a process that detects, reduces, and eliminates errors in the manufacturing sector (Al-Serhan, 2019). It streamlines the operations of supply chain management (SCM) and improves the customer experience. TQM also holds parties involved in the production process accountable for the quality they produce, while it encourages all company employees to participate and improve processes, products, and service.

Companies need to focus more on long-term success by prioritising customer care and customer satisfaction; however, company operations within the manufacturing sector have been affected by government imposed COVID-19 regulations. The Coronavirus pandemic impact has forced many companies to restructure their operations to survive and many people have lost their jobs.

The thrust of this research is to examine strategies employed by TE and BBSA in solving TQM operational challenges in the textile manufacturing sector, as well as those strategies employed by TE and BBSA in assessing the COVID-19 impact on TQM. The textile manufacturing sector is a major part of the economy as it contributes substantially to the Gross Domestic Product (GDP), accounting for 14 percent of employment in the manufacturing sector and eight percent of South Africa's (SA) GDP (Joffe, Mailer & Webster, 2019: 88). The sector is, therefore, labour-intensive as it employs many people. However, the textile industry's performance has, of late, been low, despite government intervention and support in the form of import duties and local procurement thresholds.

According to Simpeh and Amoah (2021), the government issued a protocol for the workplace COVID-19 response, encouraging both employees and employers to ensure preventive measures to reduce the risk of COVID-19 exposure. It also issued various administrative and legal measures to mitigate economic consequences of COVID-19 in industry. Textile industries in SA have faced many challenges in their business operations as a result of COVID-19 (Farooq, Hussain, Masood & Habib, 2021).

The protocol implemented employer precautions in the workplace that they must ensure that they have water and sanitary materials in the workplace. Employee precautions in the workplace implies that they must wash their hands with water and soap, then sanitise their hands. The legal and administrative measures according to Goh and Arenas (2020: 25), the government emphasised that "whereas crisis handling, and responsive capacity varies across enterprises and sectors apart from the solutions emanating from each enterprise, adopting solutions or recommendations proposed by the third parties is encouraged".

1.3 Research problem

Employment and production have stagnated in the manufacturing sector, with many companies in the textile industry becoming uncompetitive. The textile manufacturing sector was a major part of the economy as it substantially contributed to GDP and was the sole provider of yarn and fabrics. TQM operation challenges faced by the SA textile industry during the COVID-19 pandemic include:

During the hard lockdown, many companies in the textile industry had to shut down business in order to comply with COVID-19 regulations. Such regulations include travel restrictions, quarantine, social distancing, and compulsory wearing of masks, among others (Davy, 2021). This crisis forced companies to make tough decisions in the textile industry, such as lay-offs, unpaid leave for employees, and the introduction of pay cuts. It also led to job losses in the industry and forced businesses to restructure their operations to survive. Notably, small businesses in the textile industry were adversely affected (Coates, Cowgill, Chen & Mackey, 2020). Many companies were closed in the lockdown alert level five, and only reopened during alert level three.

The impact of COVID-19 on the manufacturing sector provides an insight into the long-term implications for the textile companies and the challenges they would confront (Paul, Chowdhury, Moktadir & Lau 2021). The SA President ordered a 21-day lockdown in an attempt to contain the spread of the COVID-19 pandemic, as the number of cases continued to escalate in March 2020 (Hendrikse, Parak & Van Hoving 2020). Essential services such as groceries, pharmacies, banks, and gas stations remained open; nonetheless, many companies in the textile industry experienced a rapid decline in revenue, due to not operating. Moreover, because of the panic situation created by the COVID-19 pandemic, domestic sales and the textile product demand declined, while essential items were hoarded by citizens.

During the COVID-19 pandemic, priority was placed on intensifying support for surgical and consumer masks, respirators, medical textiles, and leather and footwear products, as well as gloves, and body bags (Saidi, Gauvin, Ladhari & Nguyen-Tri, 2021). Many companies changed their production levels and started producing face masks and protective equipment kits in order to survive financially.

Production stopped, many employees lost their jobs, and many companies had to change their production levels. The transportation links and distribution mechanisms between suppliers, production facilities, and customers were severely affected. Therefore, the companies faced difficulties in disinfecting the workplace repeatedly to facilitate production (Cohen & Cromwell, 2021).

1.4 Research questions

The research questions for this study are as follows:

- Which operational challenges are faced in TQM with regards to planning at TE and BBSA, during the era of COVID-19?
- What strategies are employed by BBSA and TE in solving TQM operational challenges in the textile manufacturing sector?
- What strategies are employed by BBSA and TE to assess the COVID-19 impact on TQM?
- What mitigation measures are employed by BBSA and TE to alleviate TQM operation challenges during the era of COVID-19?

1.5 Research objectives

This research is guided by the following objectives:

- To determine operational challenges faced in TQM with regard to planning at BBSA and TE, during the era of COVID-19.
- To examine strategies BBSA and TE employed to solve TQM operational challenges in the textile manufacturing sector.
- To examine strategies used by BBSA and TE to assess the COVID-19 impact on TQM.
- To determine mitigation measures employed by BBSA and TE to alleviate TQM operational challenges during the era of COVID-19.

1.6 Preliminary literature review

This chapter presents the literature reviewed and theoretical framework that guides the study. It is an important chapter in the thesis, where its purpose is to provide the background to and justification for the research undertaken. Therefore, the fundamental constructs of this literature review include TQM, the principles of TQM, the impact of past pandemics such as Anthrax of 2001, SARS of 2003, and Ebola of 2014 on TQM, operations and SCM and its components, and the plan, do, check and act (PDCA) cycle. The PDCA model (1950s) is the theoretical framework used in this study, structured to contextualise the research problem and the study's research objectives.

1.6.1 Total Quality Management (TQM)

As defined by Sriyakul, Umam and Jernsittiparsert (2019: 228), TQM is “a philosophy that seeks to integrate all organisational functions such as marketing, finance, supply chain, engineering, production, and customer service to focus on meeting customer needs and company objectives”. TQM is thus the structured approach to the management of the company, with the focus on improving input quality through continual improvement of practices, while it also sets out the standards of quality, and can reflect internal priorities.

As a process for a customer-focused approach TQM strives for continuous improvement of business operations (Ezenyilimba, Ezejiofor & Afodigbueokwu, 2019: 15). In addition, it ensures everyone in the company works towards the common goal of improving service and product quality. TQM originated in the manufacturing sector, and its principles can be applied in different industries (Das, Roy & Nampi, 2020) as it is applicable, but not limited to the textile, finance and banking, pharmaceutical, and automotive industries, among others.

1.6.2 Principles of TQM

TQM principles include customer focus, total employee commitment, process approach, integrated systems, and a strategic and systematic approach, as well as continual improvement, fact-based decision-making, and communication (Sabijon, Magno & Evangelista, 2021: 83). As a result, these principles can be applied in various departments within the company. TQM ensures employees achieve the goals of the company and improve each function.

1.6.3 The impact of past pandemics on TQM

Shang, Li and Zhang (2021) state pandemics disproportionately affect the population that is young and economically active, while causing a long-term economic impact on the nations around the world, in addition to a short-term fiscal impact. Disease outbreaks stand to impact a variety of aspects in the economy, which includes both capital and labour markets, the consumption and production sectors, as well as foreign trades.

The companies in the textile manufacturing sector have witnessed the outbreak of the COVID-19 pandemic, which affected many industries as a result of government response, in declaring a national state of disaster and implementing accompanying lockdown levels. Besides the primary threat to people's lives, the pandemic has affected the TQM of the businesses, with companies having to shut down their operations to comply with the declared state of disaster rules and regulations and prevent the disease from spreading (Sutirna, 2020). Reduced production followed, and revenues dropped due to the COVID-19 pandemic. However, TQM was also affected by past pandemics, such as Anthrax of 2001, SARS of 2003, and Ebola of 2014. These pandemics affected the TQM of the companies within the textile manufacturing sector.

1.6.4 Operations and supply chain management (SCM)

According to Chunduri (2018: 808), “operations and supply chain management includes a broad area that covers both manufacturing and service industries, involving the functions of sourcing, materials management, operations planning, distribution, logistics, retail, demand forecasting, order fulfilment, and more”. It includes everything along the path goods travel from suppliers to consumers. The supply chain is also involved in processing materials and providing service to consumers using those materials (Montecchi, Plangger & Etter, 2019: 283). As Min, Zacharia and Smith (2019: 44) observe, the “supply chain is mainly concerned with what happens outside the company, obtaining materials and delivering products, while operations management is concerned with what happens inside the company”.

The companies in the textile industry need to build strong supply chains to gain an advantage over their competitors by offering the best value to their customers. Operations and SCM have become essential in managing risks, complexities, and dynamism. Therefore, an integrated supply chain is required for companies in the textile industry to gain maximum benefits. As Luthra and Mangla (2018: 168) assert, supply chain objectives and performance measurements essentially require understanding to build an effective supply chain within the textile industry. It can also provide an approach to identifying the potential and success of the strategies of supply management.

1.7 The PDCA Cycle

The study is underpinned by Deming’s Theory of TQM which, focuses on the four phases of continuous improvement: plan, do, check, and act (PDCA). According to Garza-Reyes *et al.* (2018: 335), “the Plan, Do, Act and Check framework was an improvement cycle based on the scientific method of proposing a change in a process, implementing the change, measuring the results, and taking appropriate action”. The role of this cycle in this study is to ascertain the influence TQM has in reducing the impact of COVID-19 on the textile manufacturing sector. William Edwards Deming developed this cycle in the 1950s, which is known worldwide today (Deming, 2018).

The improvement cycle was used as one of the tools to control the quality of goods and services. Nowadays, it is known as an approach for continuous improvement. Therefore, the aim of this study was to implement this cycle for continuous improvement in the textile manufacturing industry. It was utilised to determine whether the phases of the cycle enhance the integration of operations systems when managing a disruption of operations.

1.8 Research Methodology

The research opinion divides the research approach into inductive (quantitative) and deductive (qualitative) approaches. Thus, there are three approaches or methods used in data collection: qualitative, quantitative, and mixed method. This study adopted a qualitative approach and exploratory research design. Primary data was collected through semi-structured interviews. The collected data were analysed in accordance with thematic analysis to ensure the theoretical framework offers strong ideas of identified familiar themes.

1.9 Limitations of the study

This study was conducted in the textile manufacturing sector only. Thus, the findings cannot be used in another manufacturing sector, and is only for the textiles companies. However, the study ensured the two companies had adequate information to meet the research objectives.

1.10 Significance and importance of the study

The main aim of the research was to determine the COVID-19 pandemic impact on TQM within the textile manufacturing sector. The TQM operational challenges brought by the COVID-19 pandemic in the sector include the shutting down of business operations, decline in revenues, and a reduction in production. Moreover, many employees have lost their jobs, which also affected their standard of living. Therefore, it is essential in this research to develop different ways and strategies that would help companies manage the COVID-19 impact.

The study would improve the textile manufacturing industry and enable the companies to effectively manage the effects of COVID-19 in their operations. The study provides an insight into the economic impact of COVID-19 in the textile manufacturing sector. The findings of this study may aid in the creation of knowledge and the study, therefore, has socioeconomic value to the community. It increases public awareness and enables the community to understand the challenges affecting businesses. The COVID-19 pandemic has had a huge impact on the textile industry. This sector plays a crucial role in the country's economy as it contributes to GDP. Therefore, the study would enable companies in the textile industry to better understand how to effectively manage disruptions and mitigate risks.

1.11 Ethical considerations of the study

The study was approved in accordance with the University of KwaZulu-Natal (UKZN) ethical code of conduct. Ethical clearance was sought from the UKZN before collecting primary data. This study maintained confidentiality by keeping records secure through passwords and encryption when sending data over emails. Hassan, Rehmani and Chen (2019: 512) state that, "anonymity is a condition in which the identity of individual subjects is not known to researchers". This study ensured the information collected does not contain any identifiable information, therefore, the risk of attributing data to individuals is low.

1.12 Key terms and definitions

Table 1.1: Key terms and definitions

Key term	Definition
Total Quality Management (TQM)	It is a philosophy that seeks to integrate all organizational functions such as marketing, finance, supply chain, engineering, production, and customer service to focus on meeting customer needs and company objectives.
Operations and Supply Chain Management (SCM)	It includes a broad area that covers both manufacturing and service industries, involving the functions of sourcing, materials management, operations planning, distribution, logistics, retail, demand forecasting, order fulfilment, and more.
COVID-19	It is a common virus that causes an infection in the nose, throat, and sinuses.
PDCA Cycle	It is an iterative four-stage approach for continually improving processes, products or services, and resolving problems.

1.13 Structure of dissertation

Chapter One: This chapter introduces the study and outlined the tools employed in this research, as well as an overview of the thesis. The need for the research and the background of the study were also highlighted and the research questions and objectives the researcher intended to discuss were stated.

Chapter Two: This chapter present the related literature reviewed in this research. The information, data, ideas, and written evidence to fulfil the study's objectives will be summarised and views based on the nature of the topic will be expressed. The chapter will also introduce the key concepts that constructed the literature review and the framework that guided the study.

Chapter Three: The research methodology that guides the study in data collection will be discussed in this chapter, as well as how the study was conducted, especially when collecting information. This chapter will also outline the limitations to the study and ways used to overcome those limitations.

Chapter Four: The data presentation is dealt with in this chapter, in addition to the analysis and interpretation tools employed in data analysis.

Chapter Five: The research findings are presented and discussed in this chapter, in accordance with data collected from the interviews. The chapter will answer the research questions in correspondence with the research objectives.

Chapter Six: This chapter focuses on the study conclusion and recommendations from the results. Chapter summaries, limitations of the study, and areas for future research are presented, as well as recommendations and the overall conclusion to the study.

1.14 Chapter summary

The topic under study (TQM and COVID-19) was introduced in this first chapter, along with a discussion of the study background and research problem. It was pointed out that TQM in the textile manufacturing sector has faced operational challenges during the COVID-19 pandemic. Some of these challenges include, but are not limited to, failures, materials, and rejects. Furthermore, the chapter highlighted the research questions and the research objectives. It also provided an overview of related literature, the framework that guides the study, and the research methodology. The chapter also discussed the limitations of the study in data collection and ethical considerations, as well as key terms and their definitions, along with the dissertation structure. The following chapter will provide a literature review and the theoretical framework that guided the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review and theoretical framework that guide the study. It is an important chapter in the thesis, where its purpose is to provide the background to and justification for the research undertaken. Therefore, the fundamental constructs of this literature review include TQM, the principles of TQM, the impact of past pandemics such as Anthrax of 2001, SARS of 2003, and Ebola of 2014 on TQM, its principles and operations, along with SCM and its components, and the PDCA cycle. The PDCA model (1950s) is the theoretical framework used in this study, which consists of four phases: plan, do, check, and act. It is structured to contextualise the research problem and the study's research objectives.

2.2 Total Quality Management (TQM)

Sriyakul *et al.* (2019: 228) define TQM as a viewpoint that pursues integration of all functions of the organisation “to focus on meeting customer needs and company objectives”. These functions include marketing, finance, supply chain, and engineering, as well as production, and customer service. It is a structured and holistic approach to the management of the company in its entirety, with the focus on continuous improvement of practices to enhance input quality. TQM also details quality standards and reflects internal priorities, while Ezenyilimba *et al.* (2019: 15) further describe it as “a process for a customer-focused approach and strives for continuous improvement of business operations”. Moreover, TQM ensures the common goals of improving service and product quality are pursued by employees on all levels.

2.3 Principles of Total Quality Management

Even though TQM originated in the manufacturing sector, it is possible to apply its principles in industries such as textiles, the automotive industry, pharmaceuticals, as well as finance and banking. These principles vary from customer focus to total employee commitment, from making use of a process approach, integrated systems, and a strategic and systematic approach, to continual improvement, fact-based decision-making, and communication (Sabijon, Magno, & Evangelista, 2021: 83). These principles are, therefore, applicable to various departments, with TQM ensuring employees achieve company goals and each function is improved.

2.3.1 Customer focus

The first principle of TQM prioritises customers buying the product or the service (Dogaru & David, 2017). Customers determine the product or service quality the business offers. Therefore, when the company understands the needs and wants of the customers, it has a better chance to acquire and implement the best suited processes and materials to meet expectations. This principle can be implemented by understanding customer needs through research. Furthermore, the objectives of the company need to be aligned with the needs of the customers. Many companies in the textile industry experienced a rapid decline in revenue because they were not operating, which verifies that customer focus can increase sales and market revenue.

During the COVID-19 pandemic, increased textile sector support was prioritised in the manufacture of specific products and associated services, according to Saidi *et al.* (2021), including surgical and consumer masks, medical textiles, as well as leather and footwear products, gloves, and body bags. Therefore, companies that understand the needs of their customers and provide customer focus will be able to market and sell their products. Customers need to feel that the product is worth buying.

2.3.2 Total employee commitment

It is difficult to increase productivity and sales without employee commitment; therefore, employees are required to understand company goals and objectives. Sufficient training and necessary resources are needed to complete specific tasks to reach those goals and objectives of the company (Horvath & Szabo, 2019). The crisis resulting from regulations imposed by the government in response to COVID-19 forced companies in the textile industry to make tough decisions, such as lay-offs, unpaid leave for employees, and the introduction of pay cuts. It also led to job losses in the industry and forced businesses to restructure their operations in order to survive.

The COVID-19 pandemic has not only made it difficult for employees to do their jobs. In addition to regular work duties, they have to also worry about their health and that of their families. Employees have faced increased uncertainty about the future since the state of disaster was announced in March 2019 and have had to learn new ways of working (Esterwood & Saeed, 2020). To gain total employee commitment, companies have to communicate and acknowledge the importance of each employee's contribution. Furthermore, encouraging employees to seek opportunities for improvement and learn something new to increase their skills and experience can increase employee retention, while employees are committed and motivated towards customer satisfaction.

2.3.3 Process approach

The companies must adhere to the process of quality management, as the process helps companies to take the necessary steps at the right time to speed up production (Abdel-Basset, Manogaran, Gamal & Smarandache 2018). Many companies changed their production levels and started producing face masks and protective equipment kits, in order to survive financially. However, transportation links and distribution mechanisms between suppliers, production facilities, and customers were severely affected (Kumar, Luthra, Mangla & Kazançoğlu, 2020). Adherence to the process can be implemented by using TQM tools, such as process flowcharts to delineate the roles and responsibilities of the employees, and creating visual action plans so employees can see the specific activities that need to be completed.

2.3.4 Integrated systems

There are many departments within the company, each with different functions and purposes. Therefore, the companies need to interconnect departments with horizontal processes that focus on TQM. In addition, every employee in the department must understand the standards, policies, and processes. Nonetheless, the ongoing health and economic crisis related to the COVID-19 pandemic and the required physical distancing measures, force companies to work from home on a large scale. It has affected TQM because some employees are still trying to adapt to the new technology. However, integrated systems assist the company to survive the competition with other companies through continuous improvement (Sony, 2018). To implement integrated systems, a work culture focused on quality and using process analysis to check results for improvement have to be promoted. The company will thus be able to focus on product quality that can help achieve customer expectations.

2.3.5 Strategic and systematic approach

When the multiple processes in the company's production cycle are managed as a system to increase efficiency, the approach is both strategic and systematic (Ikram, Zhou, Shah & Liu, 2019). The spread of COVID-19 has resulted in many companies managing their business, customers, and employees in different ways in response to the global crisis. For example, several have invested in technology to communicate with their customers and suppliers. In order for a strategic and systematic approach to be implemented, resources have to be provided to not only complete the process steps but also provide employees with proper training (Regmi & Jones, 2020). Furthermore, it can be implemented by improving processes continually and upgrading the necessary equipment, allowing the company to react quickly and fix bottlenecks in the process.

2.3.6 Continual improvement

It is crucial that the companies continually look for ways to improve their processes and adapt to changes, because optimal efficiency does not happen regularly. Some companies are already planning to shift to flexible workspaces after positive experiences with remote work during the COVID-19 pandemic; a move that will reduce overall space required and bring fewer workers into offices each day. To implement continual improvement, policies need to be formulated that establish the process, product, and improvements as measurable for employees and management (McKane *et al.*, 2017). Moreover, the implemented policies should encourage innovation to improve development and processes. Continual improvement benefits the company through enhanced capabilities and knowledge to increase performance.

2.3.7 Fact-based decision-making

When companies analyse and collect data, it is essential to have enough accurate information with which to make sound, informed decisions. With technology and social media used on a massive scale to keep people safe, informed, productive, and connected during COVID-19, vast amounts of data are continually analysed to produce updated facts to inform the customer. This process of analysis and fact-checking can also lead to understanding the market and the customers better. This makes it imperative to analyse and check data to ensure it is accurate and reliable (Galvez, Mejuto & Simal-Gandara 2018). Moreover, the company may have the ability to analyse and defend past decisions by referring to factual records.

2.3.8 Communication

There is a need for employees in the company to understand the plans, strategies, and methods used to achieve the goals and desired results. However, companies continue to adjust their operations due to the COVID-19 pandemic, ensuring employees stay healthy and safe while maintaining production. As a result, fast, reliable, and open internal communication with employees has to be ensured, as well as externally with their various stakeholders, including suppliers, customers, policymakers, and the media.

To implement this, official communication lines must be established to update employees on new systems and processes (Oztemel & Gursev, 2020), which can act as motivation when their contribution to the company is understood.

2.4 Past pandemic impacts on TQM in the textile manufacturing sector

Companies in the textile manufacturing sector have witnessed the outbreak of the COVID-19 pandemic, which impacted many industries and, apart from the primary threat to people's lives, also affected the TQM of these businesses, in addition to many having to shut their operations down to comply with pandemic rules and regulations (Sutirna, 2020). Consequently, there has been a reduction in production, and revenues have dropped. However, TQM has been affected by past pandemics, such as Anthrax of 2001, SARS of 2003, and Ebola of 2014. These pandemics affected the TQM of the companies within the textile manufacturing sector, as briefly discussed below.

2.4.1 Anthrax of 2001

Anthrax, although a naturally occurring bacterial infection of herbivores, is a serious zoonotic disease and can be found nearly worldwide, with approximately 1 200 various strains, and human cases estimated at 20,000-100,000 each year (Swartz, 2001: 1621-1626, cited by Center for Food Security and Health, 2011). Unfortunately, the disease has been adapted for biological warfare, with the powdered form used in 2001 in various postal 'attacks' and hoaxes worldwide, resulting in several deaths in America and fear of further attacks fuelled across the globe. However, with an added Anthrax outbreak in central Zimbabwe after infected cows were slaughtered and human cases reported, the fear spread to SA and 224 Anthrax 'scares' were dealt with since the global panic about the disease started in early October 2001 (news24, 29 October 2001).

The Anthrax impact in 2001, as with the COVID-19 pandemic, not only affected the South African economy, but also the country's infrastructure and services offered, affecting the TQM of the textile manufacturing sector companies. Vaquero *et al* (2019: 04), this was evident when it was necessary to, for example, qualify new suppliers, as it was challenging to keep them updated without delay, where remote working was becoming the standard.

It became crucial to “coordinate and schedule network services simultaneously through different technologies across the edge-to-cloud network”. Moreover, the companies that rely on traditional systems lack real-time visibility into accurate quality data and related activities.

2.4.2 SARS of 2003

Severe Acute Respiratory Syndrome (SARS), is a viral respiratory disease caused by a Corona virus, was first reported in Asia in 2003, and is an infectious disease spread by humans. The global outbreak also raised worldwide concern for its economic impact, with travel and tourism income negatively affected in most of the infected countries during the outbreak (Folinas & Metaxas, 2020). Fear of disease was further expected to impact those industries that draw people to gather in places such as retail establishments, restaurants, and cinemas (Keogh-Brown & Smith, 2008). In addition, SARS affected the textile industry, since tourists came from other countries to buy clothes and when tourist numbers from other countries dropped, South Africans were left as the primary customers.

2.4.3 Ebola of 2014

In 2014, it became a priority for Guinea, Sierra Leone and Liberia to contain the Ebola virus and prevent its spread across the borders and between people in West Africa (Wilder-Smith & Osman, 2020) to prevent what “turned into the longest, largest, deadliest and the most complex widespread outbreak in history”. Ebola affected the TQM within the textile industry, with a shortage of labour due to illness and a rise in mortality, workplaces closing, as well as restrictions on trade and transportation to avoid transmission of the virus. Companies in the textile industry had to find local suppliers that could supply raw materials and other supplies needed for production. In addition, limits were placed on the movement of people and goods between countries, with the closing of land borders (Shang *et al.*, 2021).

2.5 Operations and Supply Chain Management

According to Chunduri (2018: 808), “operations and supply chain management includes a broad area that covers both manufacturing and service industries, involving the functions of sourcing, materials management, operations planning, distribution, logistics, retail, demand forecasting, order fulfilment, and more”. It includes everything along the path goods travel from suppliers to consumers. The supply chain is also involved in processing materials and providing service to consumers using those materials (Montecchi, Plangger & Etter, 2019: 283). As Min, Zacharia and Smith (2019: 44) observe, the “supply chain is mainly concerned with what happens outside the company, obtaining materials and delivering products, while operations management is concerned with what happens inside the company”.

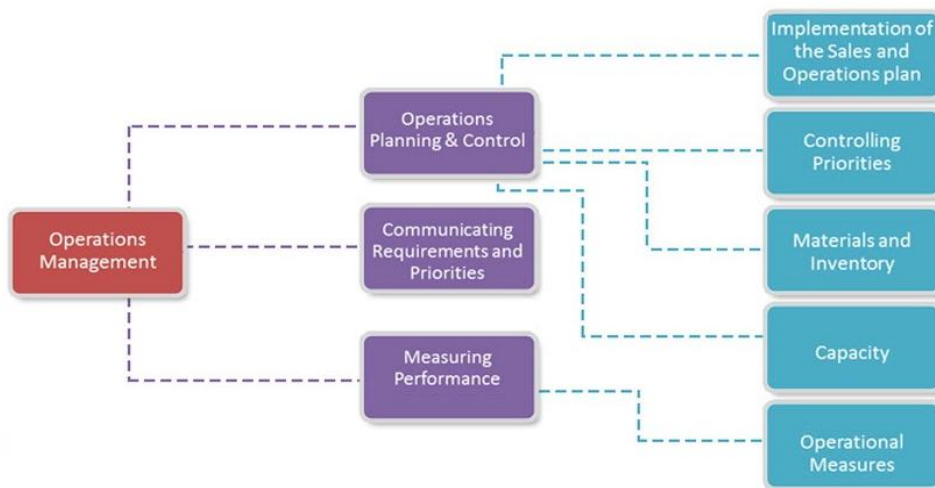


Figure 2.1: Operations and Supply Chain Management

Source: Supply Chain Council (2018: 84)

The companies in the textile industry need to build strong supply chains to gain an advantage over their competitors by offering the best value to their customers. Operations and SCM have become essential in managing risks, complexities, and dynamism. Therefore, an integrated supply chain is required for companies in the textile industry to gain maximum benefits. As Luthra and Mangla (2018: 168) assert, supply chain objectives and performance measurements essentially require understanding to build an effective supply chain within the textile industry.

It can also provide an approach to identifying the potential and success of the strategies of supply management. This awareness can also provide an approach to identifying the potential and success of supply management strategies. Companies in the textile industry have found it challenging to replenish their inventory and equipment, due to supply chain and operations disruptions. In addition, product delivery is equally challenging, impacted by restrictions and the resulting industrial activity slowdown (Cengiz & Turan, 2021). It was, therefore, essential to deploy innovative measures in distribution and inventory management, for the companies to mitigate the impact of COVID-19 on their operations and supply chain.

Engaging in strategic partnership with other players across the value chain, such as suppliers, distributors, and customers was also necessary. It is worth noting that technology can overcome the lack of visibility in the supply chain, especially from raw materials to the manufacturers and the end-users (Kurpjuweit, Schmidt, Klöckner & Wagner, 2021). Better forecasting of inventory levels can be achieved when it is well-executed, and warehouse savings can also be increased. Furthermore, the textile industry companies' workforce needs upskilling to attract digital technology, and allow management in cross-functional teams.

2.6 Operations and SCM components

2.6.1 Operations planning and control

Bishop (2018: 13), on the one hand, defines operations planning as “a day-to-day and monthly by monthly planning for what the company is doing”. On the other hand, strategic planning determines company direction, including what it is not but should be doing. Therefore, it is essential to integrate operations and strategy for planning, and to understand the differences. In addition, Chams and García-Blandón (2019: 240) observe the strategic plan also concerns setting company direction, devising objectives and goals, and identifying various strategies to pursue, in order to achieve organisational goals.

Operations planning and control can help companies in the textile industry address critical business elements during COVID-19 (Barbieri *et al.*, 2020: 131). The objective is to protect cash flow and employees from losing their jobs. Furthermore, it can provide an opportunity to identify innovations and new ways of working that may not have existed before. For example, experimentation and innovation are part of operations planning, and can now help the business emerge from the crisis stronger than before. Operations planning also guides the company's management according to stakeholder goals and priorities. According to Franz and Messner (2019), the operations plan presents detailed information essential in directing people to perform day-to-day tasks required to operate the company. Therefore, the company's management and staff need to be guided by the operations plan when conducting daily activities.

2.6.2 Communicating requirements and priorities

Managers and leaders translate strategy into manageable strategic priorities, designed to increase alignment throughout the company (Sull, Turconi & Sull, 2018: 13). This means executives focus on sharing their message to employees through corporate communication, in the form of meetings and emails, when communicating objectives. In addition, external leaders and managers communicate their strategies and priorities to key stakeholders, such as investors, suppliers, customers, and regulators.

Corporate communication also affords companies in the textile industry the opportunity to indicate their intended direction. Moreover, clear strategies can also attract potential investors and external partners. Furthermore, when strategic priorities are linked to explicit metrics, the companies may have a framework to evaluate progress (Sdoukopoulos, Pitsiava-Latinopoulou, Basbas & Papaioannou, 2019). Some companies have reported their progress in prioritising tracking concrete metrics, such as market share, new product launches, and cost reduction in SA. Applications could thus be adapted when establishing COVID-19 specific policies and procedures, capabilities for employee communications, and telecommuting to minimise disruptions (Sdoukopoulos *et al.*, 2019).

2.6.3 Measuring performance

The strategic plan must specify goals, final performance measures, and any action that enables management and stakeholders to gauge success. While top management performance can be measured in terms of market share, sales volume, cash flow, and market value (Wang & Dass, 2017), this is not possible in operations management, where disjunction and disconnection can exist, requiring a strategic plan that is well-connected. Disjunction and disconnection exist due to lack of alignment and proper management of the business processes. This misalignment of performance measurement between strategy, operations, and goals is often poorly understood in many companies (Frishammar & Parida, 2019). Evidently, management does not prioritise and emphasise performance measurement alignment.

Companies are found to be curtailing performance management because of difficulties measuring performance and disruptions in performance-based pay due to the COVID-19 crisis (Aguinis & Burgi-Tian, 2021). Contrary to this growing and troubling trend, it is essential to continue and strengthen performance management during the crisis, communicate the strategic business direction, collect valuable business data, and provide critical feedback to stakeholders.

Critical success factors at strategic level should be linked to the business and activity process (Alhuraish, Robledo & Kobi, 2017). It is a prerequisite for the companies to successfully link the real drivers of business to performance, in order to effectively measure performance. Hence, the primary purpose is to assess performance levels and analyse what is occurring (Clark & Watson, 2019). This would enable the company to identify problem areas and focus attention on actions that impact business performance. It is easy to fall into the common trap of achieving few measurable results, without good execution in variability. Top management should be intrinsically motivated to focus on prioritised activities.

2.7 PDCA cycle to enhance continuous improvement

Godoy and Bessas (2020: 01) explain the PDCA cycle as “an iterative four-stage approach for continually improving processes, products or services, and resolving problems”. It involves testing possible solutions, assessing results, and implementing those that work. Moreover, it is based on the scientific method of solving problems. Dr. W. Edwards Deming, known as the father of modern quality control, popularised this approach in the 1950s. The PDCA cycle was, therefore, used as a framework to answer the research questions in this study.

The cycle is an appropriate framework because it provides a simple and effective approach to present solutions and manage change. Companies are able to develop some hypotheses through the cycle about what has to be changed, test that hypothesis, and gain valuable learning and knowledge. This, in turn, promotes testing improvements, especially on a small scale, before updating company and work methods procedures. The PDCA cycle guarantees protection of quality and contributes to manufacturing cost reduction, as well as being friendly to the environment (Ghoreishi & Happonen, 2020).

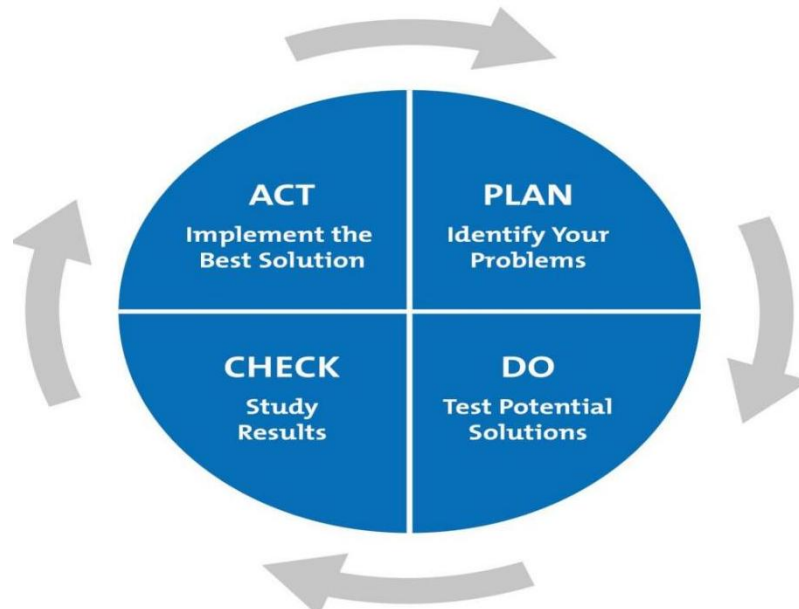


Figure 2.2: PDCA cycle

Source: Aggarwal (2020: 31)

2.7.1 Plan phase

As Mohajan (2018) explains, this phase includes identifying the problem, collecting relevant data, understanding the root cause, and developing hypotheses. According to Devadiga (2017: 924), a “plan is a three-step process: identify the problem, analyse the problem, and develop an experiment to test”. When identifying a problem, it is essential to consider its impact on the company, as well as its main causes, before analysing the problem. Therefore, when analysing the problem, consider the information needed to understand the problem and related data. Hence, developing an experiment requires viable solutions that involve stakeholders in the process who anticipate the outcome of the experiment (Bocken, Schuit & Kraaijenhagen 2018: 79).

2.7.2 Do phase

Angelopoulos *et al.* (2020: 109) explain the ‘do’ phase is when the solution is developed and implemented, measurements decided upon to gauge its effectiveness, and testing the potential solution rather than the results. According to Elwardi, Meddaoui, Mouchtachi and En-nhaili (2021: 367), this is the phase in which the companies need to test the proposed solutions and changes in order to carry out small-scale studies. This would allow them to learn quickly and adjust as needed, while it is also less expensive to undertake. This means it is essential to ensure performance is measured, and the necessary data collected to facilitate subsequent evaluation.

2.7.3 Check phase

As Allam and AlSadhan (2019: 14) suggest, the check phase confirms the results before and after comparing data, in other words: study the results, measure the effectiveness, and then decide whether the hypothesis is supported. This phase also reviews the experiment, analyses the results, and corroborates whether the implementation achieved the desired results (Hasan & Hossain, 2018). The companies need to learn from the implementation and ensure they have adequate data to verify the effectiveness of the assessment. In addition, this phase also analyses the results of change, determines learning lessons, and compares with targets to ensure solutions informed adequate results.

2.7.4 Act phase

In this phase, Ebrahim (2019) explains stakeholders are informed with regard to changes in the process and recommendations offered for future PDCA cycles. Therefore, when the solution is successful, it can be implemented; if not, another problem is tackled and the cycle repeated. It is crucial to implement actions and when nothing changes, then the cycle is repeated. Companies that successfully implement the changes need to standardise their processes and implement these across the entire business (Neves *et al.*, 2019). The companies in the textile industry require appropriate actions to overcome the challenges they are confronting and decide on the changes necessary to manage the COVID-19 impact within the industry.

2.8 Chapter summary

The chapter presented the literature reviewed and identified a gap in related literature the researcher aimed to address. The fundamental constructs of the literature review have been unpacked, which include TQM and its principles, operations, SCM and its components, as well as the protocol issued by the Ministry of Labour and Social Affairs, and the challenges of COVID-19 in the textile manufacturing sector. Such challenges include the shutdown of operations, decline in revenues, and reduced production.

The following chapter will provide an overview of the research methodology used in this study, examining the research philosophy, design, and approach, along with the study site, target population, sampling strategies, and sample size, as well as the data collection methods, data quality control, data analysis, ethical considerations, and study limitations.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research, according to Linnenluecke, Marrone and Singh (2020), is a systematic and logical search for valuable and new information on a particular topic. As Taylor (2020: 147) affirms, “research investigates finding solutions to scientific and social problems through objective and systematic analysis”. The information can be collected from various sources of secondary or primary data. While the reviewed literature comprises the secondary source, this study collected primary data using interviews as source. Research methods and research methodology are terms that can be used interchangeably.

Ullah and Ameen (2018: 53) assert that research methodology is “a set of the systematic techniques used in research”. It is a guide for the research and how it is conducted. This chapter outlines an overview of the methodology used in this study. It consists of the research philosophy, design, and approach, as well as the study site, and target population. The sampling strategies, sample size, data collection methods, and data quality control, as well as data analysis, ethical considerations, and the limitations of the study are also set out.

3.2 Research Philosophy

Kivunja and Kuyini (2017: 24) define research philosophy as an "asset of beliefs concerning the nature of the reality being investigated, and the choice of the type of research philosophy applied in an area of research study depends on the knowledge being investigated". It differs on the research goals and the way to achieve them. Many different research philosophies are explained in the research onion (Saunders, Lewis, Thornhill and Bristow, 2017: 34), such as axiology, ontology, and epistemology (Fig. 3.1). According to Peers (2018), axiology is a research philosophy that studies values and judgments, especially aesthetics and ethics. Some values are preferences based on what can be considered as good.

Ontology is explained as concerned with "what kind of world we are investigating, with the nature of existence, with the structure of reality as such" (Maletic, 2018: 09). Epistemology is concerned with providing a philosophical grounding for deciding the types of possible knowledge and how to ensure they are both adequate and legitimate (Al-Ababneh, 2020).

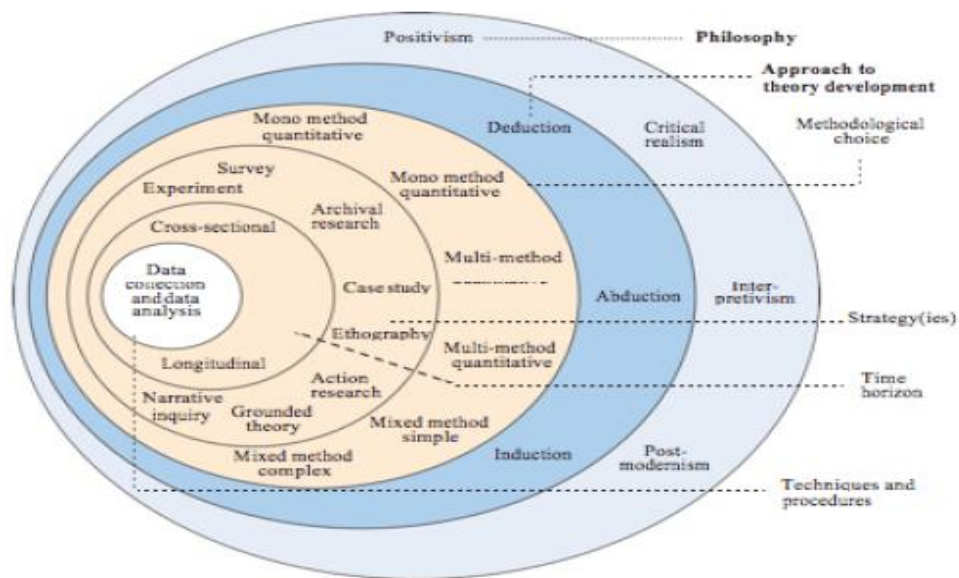


Figure 3.1: Research onion

Source: Saunders *et al.* (2017: 34)

Each research philosophy has different paradigms, including positivism, interpretivism, realism, objectivism, and pragmatism. It influences how researchers perceive the entire research process. As Gantsho and Sukdeo (2018) explain, on the one hand, positivism is a paradigm that adheres to the view that the factual knowledge gained from observation and measurement is trustworthy. On the other hand, pragmatism accepts the relevant concepts when they support action, and it is a determinant of the critical research approach. Realism, according to Melnikovas (2018: 29), “relies on the idea of independence of reality from the human mind and based on the assumption of a scientific approach to knowledge development”. Furthermore, Pulla and Carter (2018: 90) explain interpretivism “is the view that reality, truth, and knowledge is subjective, impacted by culture and history and based on individual experiences and interpretations, which may allow for better meaning in human interactions to be captured”.

This study adopted interpretivism and the qualitative method of primary data collection. It helps construct the theory, and responses from participants are valid. Moreover, the information collected using interpretivism can be associated with a very high level of validity because the data, in most cases, is honest and trustworthy (Rose & Johnson, 2020). According to Maree (2010), “the social context, conventions, norms and standard of the particular person or community are crucial elements in assessing and understanding human behavior”.

3.3 Research design

The research structure holds some aspects of the research project together and the proposed research plan. According to Sovacool, Axsen and Sorrell (2018: 12), "research design is the arrangement of the conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy and procedure." The design of the research demonstrates how the study can provide priorities in the dimensional range of the research process. It guides the planning, as well the implementation of the study to answer the research questions adequately. Moreover, the aim is to provide the framework for data analysis and collection.

Strackiewicz, James and Onnela (2021: 15) assert that, “research design can be identified as an activity and time-based plan, which is derived from the research question”. Therefore, it is a method for selecting relevant information and appropriate sources. There are different types of research design, such as exploratory, descriptive, and case study research design. This study employed an exploratory research design to obtain more information on the current status of the textile manufacturing industry and evaluate the COVID-19 impact on TQM.

3.3.1 Exploratory research design

Exploratory research design is employed for a problem not previously researched (Bandalos & Finney, 2018: 98). It is suitable when the researcher does not have previous information and few studies for reference. This research design, therefore, serves as a tool for proving the theoretical idea of the research problem. Furthermore, exploratory research can also be conducted to determine the nature of the problem and develop a better understanding thereof. However, it requires the researcher to investigate various sources of information, such as primary or secondary data. As Alase (2017: 09) observes, exploratory research also assists in understanding how to research the problem and the methodology to use in collecting information. The importance of the research design is based on connecting the arguments and theories that inform empirical data.

3.4 Research approach

Saunders *et al.* (2012) depict the research process using a research onion (Fig. 3.1), with the research approach in the second layer (Melnikovas, 2018: 29). It is divided into an inductive (quantitative) approach and a deductive (qualitative) approach. According to Abutabenjeh and Jaradat (2018: 237), "research approaches are plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation." Therefore, the selection of the research approach is determined by the nature of the problem.

There are three types of research approaches namely qualitative, quantitative, and mixed-method research approaches. Determining the research method appropriate for the study depends on different aspects such as the topic, research questions, and objectives (Abutabenjeh and Jaradat, 2018). This study employed a qualitative approach when collecting primary data through interviews. The collection of data is exploratory because it involves in-depth analysis.

3.4.1 The qualitative research approach

Mohajan (2017: 23) defines the qualitative research approach as “a primary research tool that is used to gain an understanding of underlying reasons, opinions, and motivations, which further provides insights into the problem”. In some cases, this research approach is used to test textual responses and collect data from surveys, interviews, observations, conventional analysis, and focus groups. It is an approach that involves delivery, described by Myin-Germeys *et al.* (2018: 123-132) as “an unfolding model in a natural setting that allows the researcher to develop detail from high involvement in the actual experiences”. Therefore, it builds premises on inductive rather than deductive reasoning.

3.5 Study site

Sheehan (2018) explains that a study site is a place to conduct the study and collect the required data. The researcher selected two companies, TE and BBSA, which were the leading companies in the textile manufacturing sector in Durban (Lehner, Mont, Mariani & Mundaca, 2020). These companies manufacture home textiles, lifestyle textiles, and other finished products. Thus, the study was conducted at TE based in Umgeni Road and at BBSA in Sherwood.

3.6 Target population

According to Sovacool *et al.* (2018:12), "the target population refers to the entire group of people, events, or things of interest that the researcher wishes to investigate." However, it can be referred to as the total number of individuals with characteristics and interests to a researcher. This study targeted two companies in the textile industry based in Durban, KZN Province. The population included all employees working for these companies, focusing on the demand and supply planners, supply chain function, sales, and marketing function employees.

Table 3.1: Target Population

Company	Demand and Supply Planners		Supply Chain Function		Sales and Marketing Function		Total
	Roles	No	Roles	No	Roles	No	
Best Branding South Africa	Demand planners	3	Operations managers	3	Financial controllers	6	
	Supply planners	2	Receiving	4			
	Factory planners	5	Quality inspectors	3			
Textiles Express	Roles	No	Roles	No	Roles	No	
	Demand planners	4	Operations managers	4	Financial controllers	10	
	Supply planners	5	Receiving	3			
	Factory planners	7	Quality inspectors	5			
Total		26		22		16	64

Source: BBSA and TE (2021)

3.7 Sampling strategies

The two main categories of sampling strategies are non-probability and probability sampling. Rahi (2017) asserts that probability sampling involves random selection at some stage. This is confirmed by Sarstedt, Bengart, Shaltoni and Lehmann (2018: 650), on the one hand, when they state that, “in probability sampling, every element in the population has an equal chance of being selected”. According to Sarstedt *et al.* (2018: 650), “non-probability sampling, on the other hand, is where the elements in the population do not have any probabilities associated with being selected as sample subjects”. It includes judgemental, quota, convenience, purposive, and snowball sampling and is the best sampling method for exploratory studies, while also suitable for case studies (Yadav, Singh & Gupta 2019).

This study, therefore, used non-probability sampling, where the elements in the population do not have any probabilities associated with being selected as sample subjects. It also adopted a purposive convenience sampling technique, which involves selecting those participants who are accessible and in the best position to provide the required information on COVID-19 associated and related operations challenges.

3.8 Sample size

Bastian and Lardo (2018: 83) describe a sample as “a subset of a population, where particular elements or numbers of elements are selected from the population”. However, according to Ahmad and Halim (2017: 20), “sample size is determined by the level of precision and confidence desired in estimating the population parameters, as well as the variability in the population itself”.

The sample of this study was drawn from the target population, including demand-supply planners, supply chain function, sales, and marketing function employees. In this study, not all employees had an equal chance to participate since non-probability sampling was employed.

The study was qualitative, and used the point of saturation to determine the ultimate sample size. Seven employees were selected at BBSA to participate, with two participants from the demand and supply function, two from the supply chain function, and three from sales and marketing. In addition, eight employees were selected at TE to participate, with two participants from the demand and supply function, three from the supply chain function, and three from sales and marketing. The total population was 64, and this study recommended a sample size of 15 employees to participate from both companies. Not all employees had an equal chance to participate and be selected. Therefore, this sample size was estimated by selecting every function within the company.

3.9 Data collection methods

Ledford (2018: 71) defines data collection as “the process for gathering data and measuring information on the variables of interest and the established systematic fashion, enabling the researcher to answer questions and evaluate the outcomes”. There are two methods for data collection, which include primary and secondary data. In this study, primary data were collected through interviews that offered first-hand experience. According to Adhabi and Anozie (2017), there are three types of interviews, namely, unstructured, interviews, and semi-structured interviews. This study utilised semi-structured interviews, because the research questions are prepared prior to the interview, allowing the researcher to analyse them. It is an effective method for data collection when the researcher wishes to obtain qualitative primary data and explore participant responses regarding the research topic.

3.9.1 Semi-structured interview

A semi-structured interview is defined as an interview that uses protocols to guide the researcher in the interview process. It maintains the structure of the interview and allows the researcher to probe the respondents or participants. Multiple rounds of interviews are not needed, and the researcher is assured the information collected is adequate, as guided by the structure of the interview. However, this type of interview is suitable for researchers that do not require detailed information about the research topic (DeJonckheere & Vaughn, 2019).

The interview questions are formed by the research objectives and the study aims. It is the best type of interview as it collects qualitative data, while also allowing the researcher to express the questions of the discussion in the format they prefer (DeJonckheere & Vaughn, 2019). In addition, this study conducted open-ended interviews, enabling participants to express their knowledge and thoughts based on reliable information. In this type of interview, it is very productive to collect open-ended information from the respondents or the participants (DeJonckheere & Vaughn, 2019).

3.9.2 The process of conducting semi-structured interviews

According to Alase (2017: 09), this process includes “preparation for the interview, writing a guide, introducing the researcher and the study, asking the interviewees questions, writing down the impressions, collecting and ending the interview”. Thus, the steps below were followed in conducting semi-structured interviews.

Step one: Preparation for the interview

The researcher noted the kind of information that needed to be obtained, by reviewing previous observations and identifying potential gaps in the study. Furthermore, the areas of the topic that the interviewees needed to elaborate on were also written down.

Step two: Writing a guide

Once an idea of the questions that needed to be answered was formed, a guide that included all the questions was developed. The questions were fair, understandable and approved by the ethics committee, in accordance with the requirements of the school.

Step three: Introducing the researcher and the study

In this step, the researcher introduced himself and the study to the participants for convenience’s sake. Moreover, the researcher explained the research purpose to the interviewees, in addition to the topic and themes the study covers.

Step four: Asking interviewees questions

When asking questions, the researcher started with questions about the interviewees' personal profile and moved to questions based on the study aims and objectives. The interviewees responded to the questions, and were free to ask when they did not understand the question.

Step five: Writing down the impressions

The researcher noted impressions after interviewing participants to ensure the relevant information was collected. The interviewees provided adequate information, and the researcher made note of their responses.

Step six: Collecting and ending the interview

At the start of the interview, the guide for the interview schedule, with all the questions, was given to the interviewees. The researcher collected the information from the interviewees based on their responses. Before ending the interview, the researcher gave the interviewees a chance to ask questions. The interview ended, and it was a success.

3.10 Data quality control

Kyngas, Kääriäinen and Elo (2020: 41) state data quality is the most critical factor in ensuring the data collected are valid, reliable, and trustworthy; it would be trustworthy to make sound and informed decisions based on the collected data. Ibiame and Ajekwe (2017) assert that four aspects are considered to ensure data quality control when qualitative research is conducted. This comprises “credibility/trustworthiness, transferability, dependability, and confirmability” (Ibiame and Ajekwe, 2017: 157-170). Credibility is when the findings of the research are trustworthy and plausible, while Mohajan (2017: 59) states that, “dependability is an extent to which the research can be replicated in similar conditions”. Confirmability, on the one hand, is when there is a clear link or relationship between the data, as well as the findings. On the other hand, transferability is when the results can be transferred to another context, setting, and group (Stenfors, Kajamaa & Bennett, 2020: 596).

This study applied trustworthiness/credibility, since it is a qualitative discourse. Trustworthiness is known as the degree of confidence in data, methods and the interpretation used to ensure the quality of the study (Lemon & Hayes, 2020). In this study, it was essential to establish the protocols and procedures necessary for the research to be considered worthy. This study ensured the data are trustworthy by using persistent observation and data triangulation. Persistence in observation identifies elements and characteristics relevant to the research problem, with data triangulation using multiple sources of data in different methods to answer the research questions.

3.11 Data analysis

The process of transferring, modelling, and cleaning data to discover helpful information for business decision-making is considered as data analysis (Saggi & Jain, 2018). This research emphasises extracting useful data that inform the analysis. There are many tools to analyse data, and this study applied NVivo to analyse data following thematic analysis. As Mortelmans (2019: 435) explains, Nvivo “is a computer-assisted qualitative analysis software package by QSR International”. It is a tool that examines data, especially for primary qualitative research (Sherif, 2018).

NVivo can be employed for a mixed and qualitative approaches to analyse information from interview scripts, spreadsheets, and survey responses. According to Maguire and Delahunt (2017: 01), “there are six phases of the thematic analysis: phase one: familiarising yourself with data; phase two: Generating initial codes; phase three: searching for themes; phase four: reviewing themes; phase five: defining and naming themes; phase six: producing the report”.

3.12 Ethical Consideration

The study was approved through ethical clearance from the UKZN before collecting any primary data. This study maintained confidentiality by keeping records secure through passwords and encryption when sending data over emails. As Hassan *et al.* (2019: 512) state, “anonymity is a condition in which the identity of individual subjects is not known to researchers”. This study ensured the information collected does not contain any identifiable information, therefore, the risk of attributing data to individuals is low.

3.13 Limitations of the study

This study was conducted in the textile manufacturing sector only. The findings of the study cannot thus be used in another manufacturing sector, since it applies to only the textiles companies. The study ensured the two companies under study had adequate information to meet the research objectives.

3.14 Chapter summary

The methods chapter explained research methodology as a set of systematic techniques used in research. This chapter is a guide for the study and how it is conducted, as it outlined an overview of the research methodology used in the study. Therefore, it mentioned the research philosophy, design, and approach, the study site, target population, sampling strategies, and sample size, as well as data collection methods, data quality control, data analysis, and ethical considerations, along with the study limitations. This study adopted interpretivism as the research approach, is qualitative and follows the primary data to collect information. The following chapter provides data analyses and interpretation of results from BBSA and TE.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The previous chapters offered a brief discussion of the study, the literature review, and the research methodology employed to collect data. This chapter analyses and interprets the data from TE and BBSA. The study collected primary data using semi-structured interviews, with data analysed thematically using NVivo version 12. Analysis commenced with revisiting the research objectives as it relates to the data interpretation and analysis. The interviewees in this study have been named P1 to P8; those from Best Branding South Africa under the BBSA acronym and participants from Textiles Express with TE.

4.2 Research objectives

This research is guided by the following objectives:

- To determine the operations challenges faced by TQM with regards to planning at BBSA and TE, during the era of COVID-19.
- To examine the strategies employed by BBSA and TE in solving TQM operations challenges in the textile manufacturing sector.
- To examine the strategies BBSA and TE employed in assessing the COVID-19 impact on TQM.
- To determine the mitigation measures BBSA and TE implemented to alleviate TQM operations challenges during the era of COVID-19.

4.3 Company profile of participants

A personal profile of each interviewee was collected in order to describe the sample that best suited this study. The profile of company participants included their gender, age, race, and educational qualifications, as well as tenure of employment in the company, and their occupation, as outlined in Sub-sections 4.3.1 to 4.3.6 and illustrated by Figures 4.1 to 4.12.

4.3.1 Gender of participants

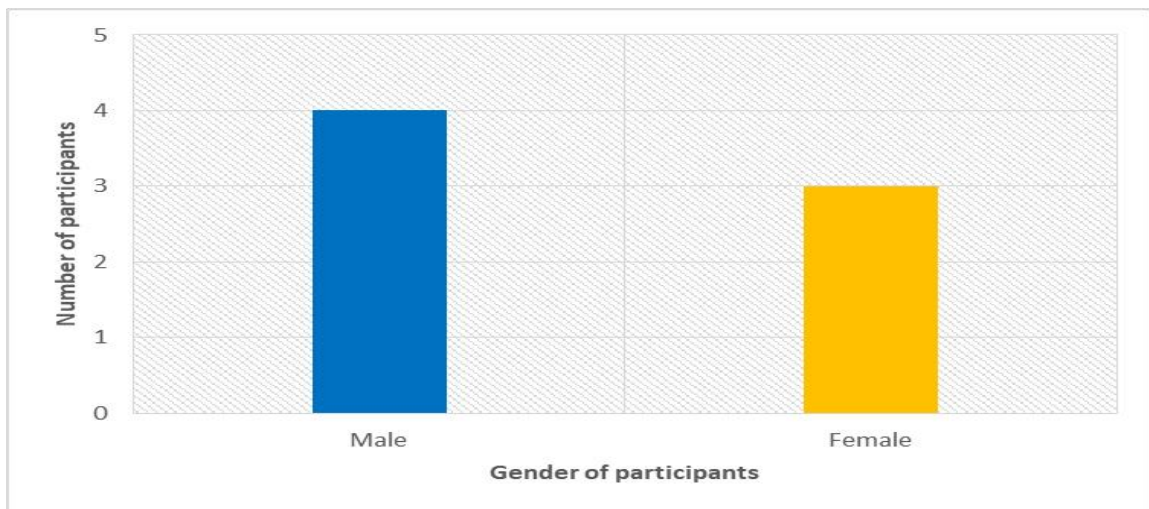


Figure 4.1: Gender of participants at BBSA

As illustrated (Figure 4.1), participants comprised four male and three female employees from BBSA. The study does not place more emphasis on the distribution of gender; however, gender inclusion is not well-balanced, with study participants not having an equal chance of being selected. Most participants are male, as most managers and supervisors are male; they deal with company operations, from the operations level to top management.

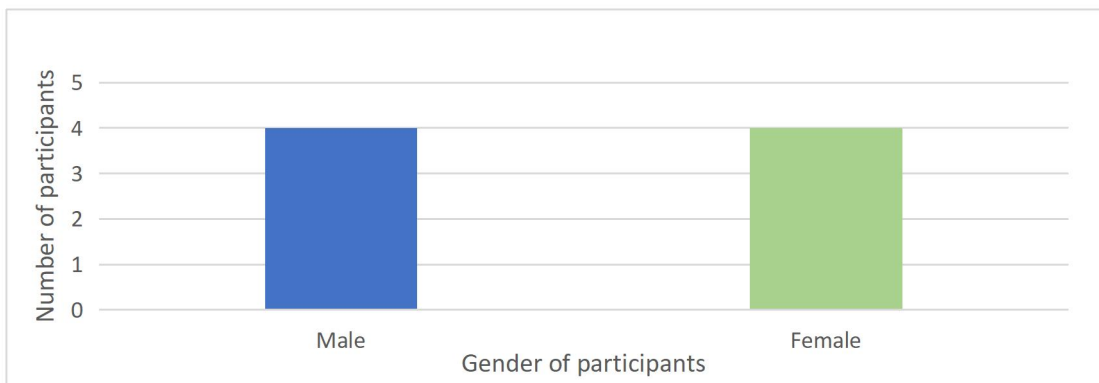


Figure 4.2: Gender of participants at TE

As illustrated (Figure 4.2), four participants are males, and four are females at TE. As a result, the distribution of gender from the participants was equal and balanced. This can be attributed to policies that promote equality in the workplace in existing departments.

4.3.2 Age of participants

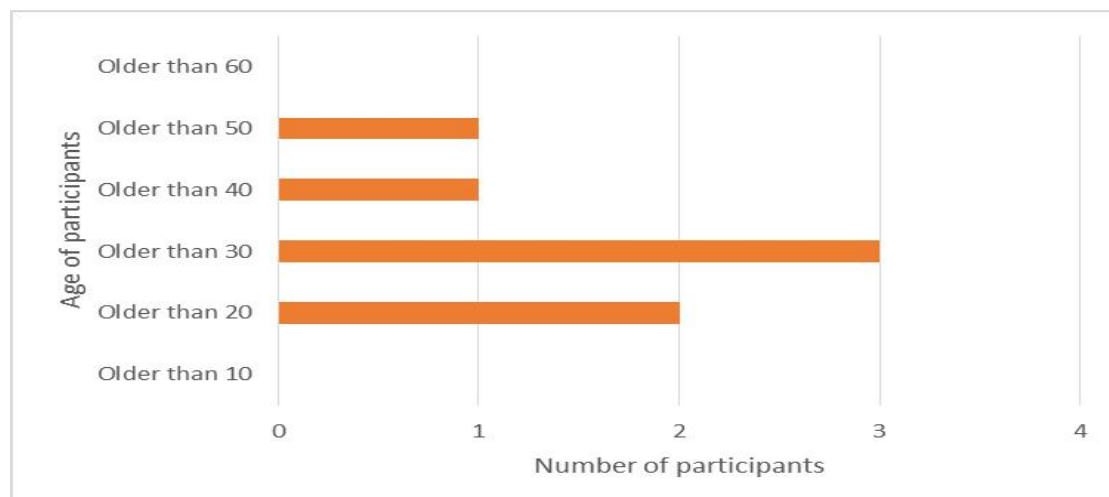


Figure 4.3: Age of participants at BBSA

Figure 4.3 illustrates the age distribution of participants at BBSA. There were two participants older than 20 years, while three participants were older than 30 years. Furthermore, one participant was older than 40 years, and one participant was older than 50 years of age.

The study needed to indicate the age of participants, for both newly appointed employees and those who have been with the company for an extended time, as this provides information regarding their knowledge and understanding of company operations.

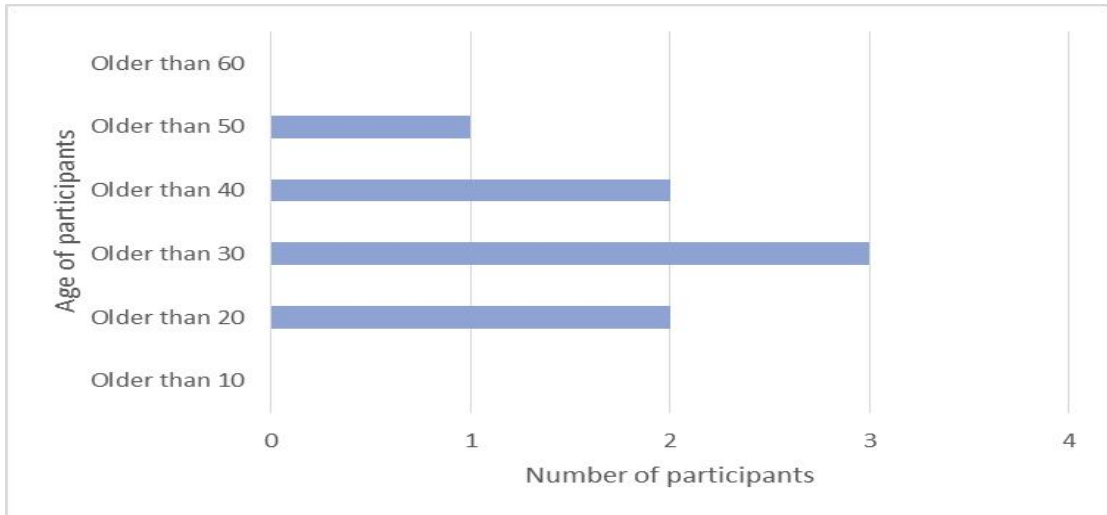


Figure 4.4: Age of participants at TE

Figure 4.4 illustrates the age of the participants at TE. Two participants were older than 20 years, while three were older than 30 years. In addition, two participants were older than 40 years, and one participant was older than 50 years. The results have shown most participants are senior members of staff, and their roles and responsibilities in company operations are critical to this study.

4.3.3 Race of participants

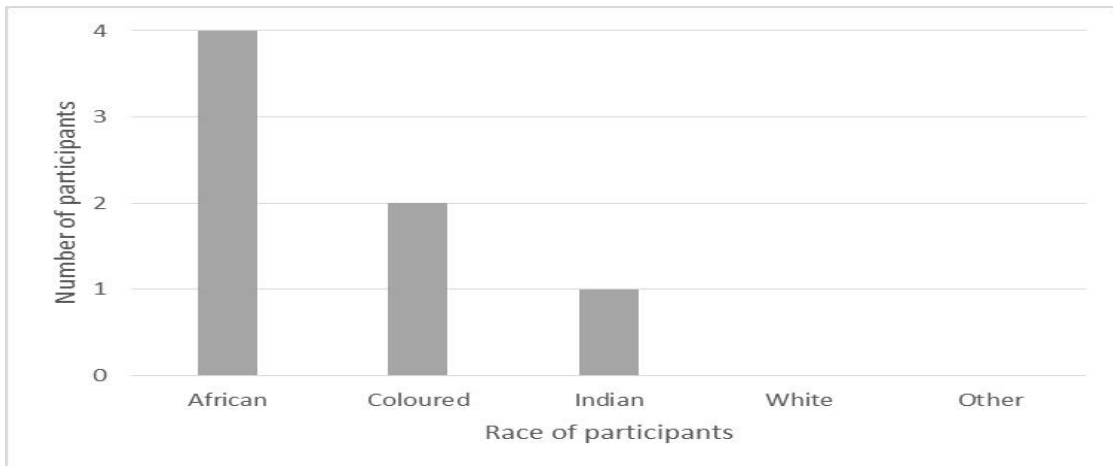
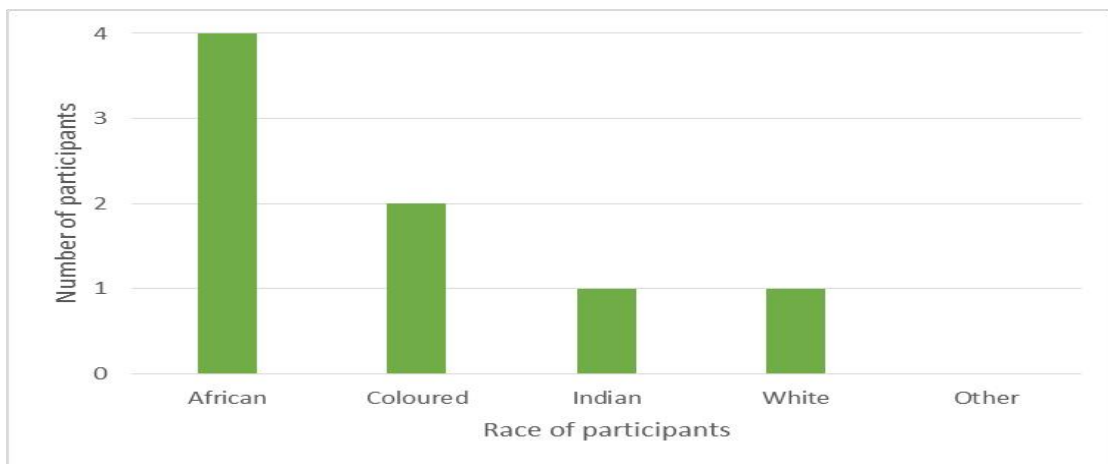


Figure 4.5: Race of participants at BBSA

Participants from BBSA also indicated their race (Figure 4.5), with most participants African: there were four Africans, two Coloureds, and one participant was Indian. Therefore, there were no participants from other races. It is important to promote diversity in research because it allows the study to have strong arguments from different points of view. The lack of diversity among the participants might have negative



consequences.

Figure 4.6: Race of participants at TE

Figure 4.6 indicates the race of participants at TE, with four African participants, two were Coloured, with one Indian, and one White participant. The race of participants in the study is essential in order to, for instance, understand the language used when conducting interviews. The results have also shown participants were able to answer the questions properly, regardless of their race.

4.3.4 Educational qualifications of participants

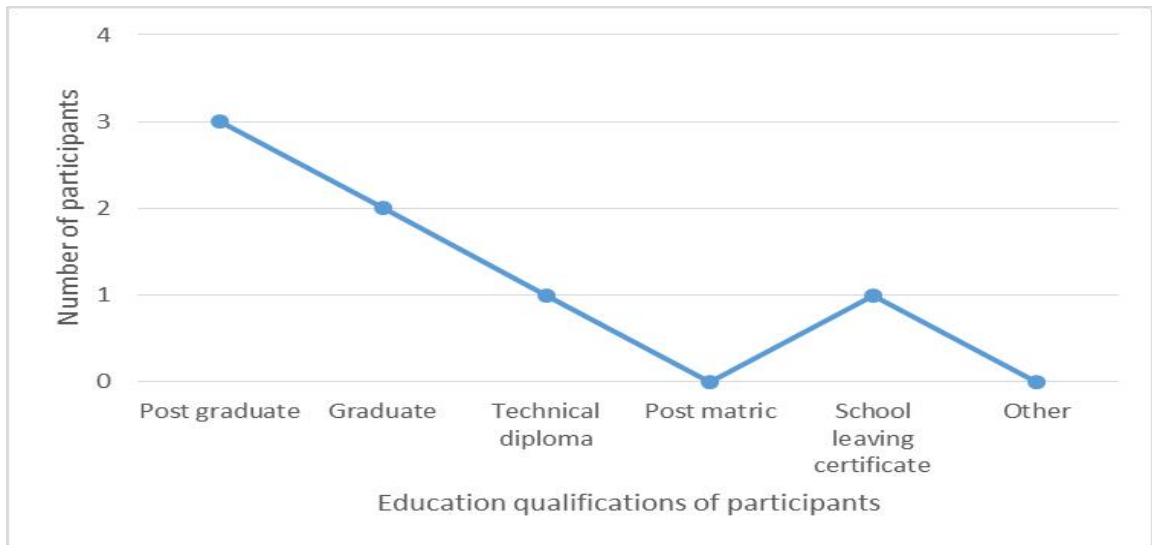


Figure 4.7: Educational qualifications of participants at BBSA

The BBSA participants were asked to indicate their educational qualifications. The level of educational qualification means the highest scholarly/academic achievement the participant holds. As illustrated (Figure 4.7), three participants have a post-graduate qualification, two participants are graduates with degrees, one participant with a technical diploma, while one participant achieved a school-leaving certificate.

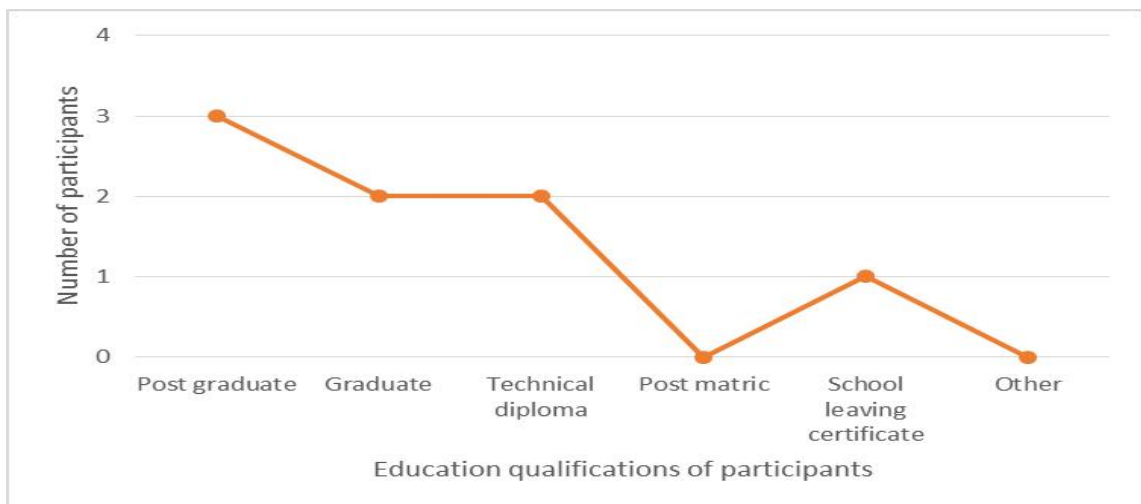


Figure 4.8: Educational qualifications of participants at TE

Figure 4.8 illustrates the level of education of the TE participants. It shows three participants hold post-graduate qualifications, two are graduates, and two attained technical diplomas. Furthermore, one participant held a school leaving certificate. There were no participants still studying or with no qualifications. This information has benefited the study by showing participant education levels meet the study requirements, based on their understanding and knowledge in SCM and operations.

4.3.5 Experience of participants in years worked

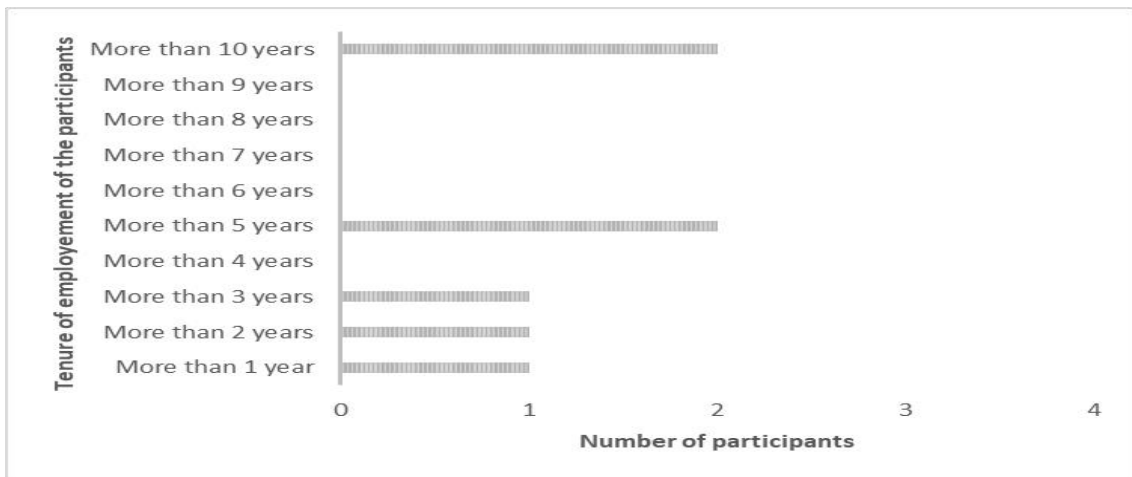


Figure 4.9: Tenure of participant employment at BBSA

Figure 4.9 provides the employment tenure of participants at BBSA. This information was collected to determine the level of experience participants have in quality operations challenges. The results show two participants have experience of more than 10 years and two participants have more than five years' experience, with another one having experience in excess of three years. Furthermore, one participant had more than one year experience, whilst another one had experience of more than two years.

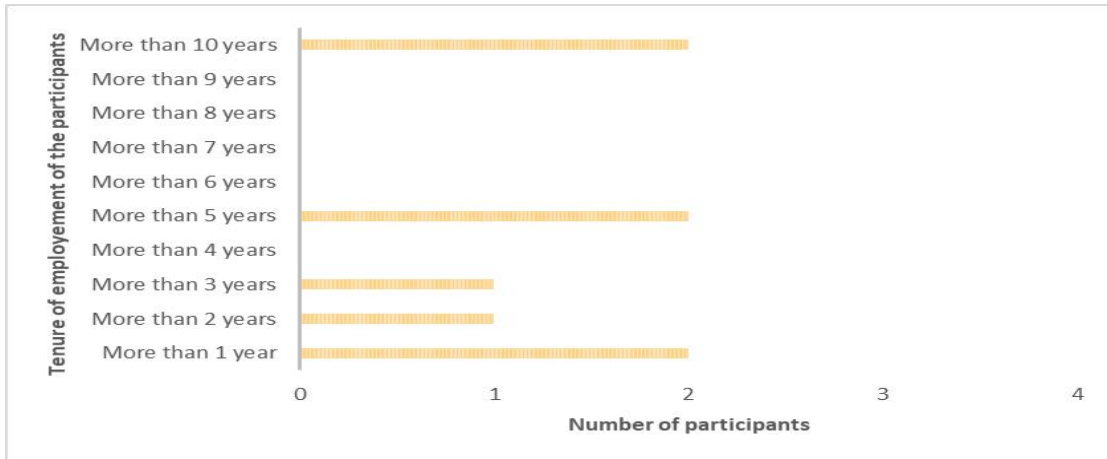


Figure 4.10: Employment tenure of TE participants

Figure 4.10 illustrates that two participants had experience of over five years, and two participants had experience of more than 10 years at TE. Furthermore, two participants had experience of more than one year, one with more than two years, and one had more than three years’ experience. Most participants show lengthy employment at the company, and understand company operations better. Other quality operations challenges prior to COVID-19 are also some challenges currently faced. Furthermore, information is needed to understand those challenges and their root causes, in order to put viable solutions in place.

4.3.6 Occupation of participants

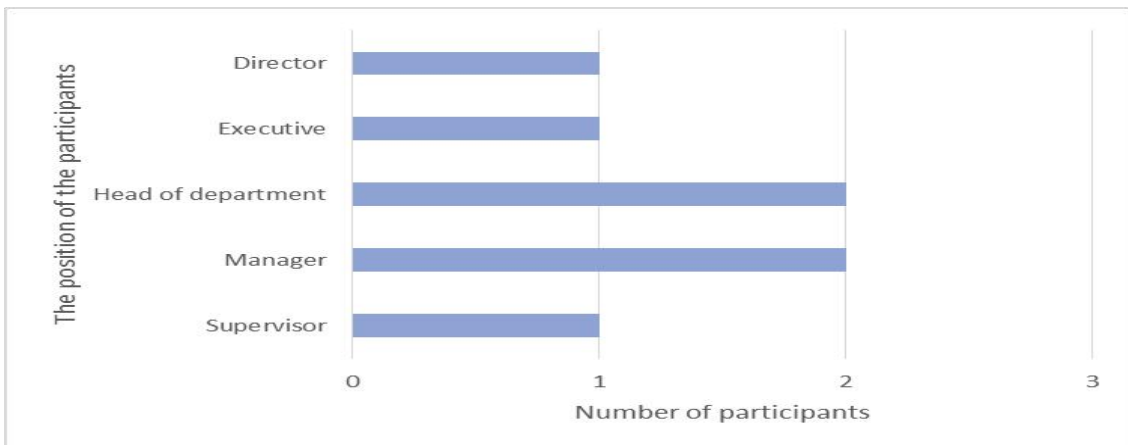


Figure 4.11: Positions occupied by BBSA participants

The positions held by BBSA participants are indicated in Figure 4.11; determined to ensure they are familiar with the systems and processes related to operations and SCM. One participant was shown to be a supervisor, one was an executive, and one participant was a director. In addition, two participants were managers and two were the head of their departments. As a result, participants had vast knowledge and experience in the company to positively contribute to the study.

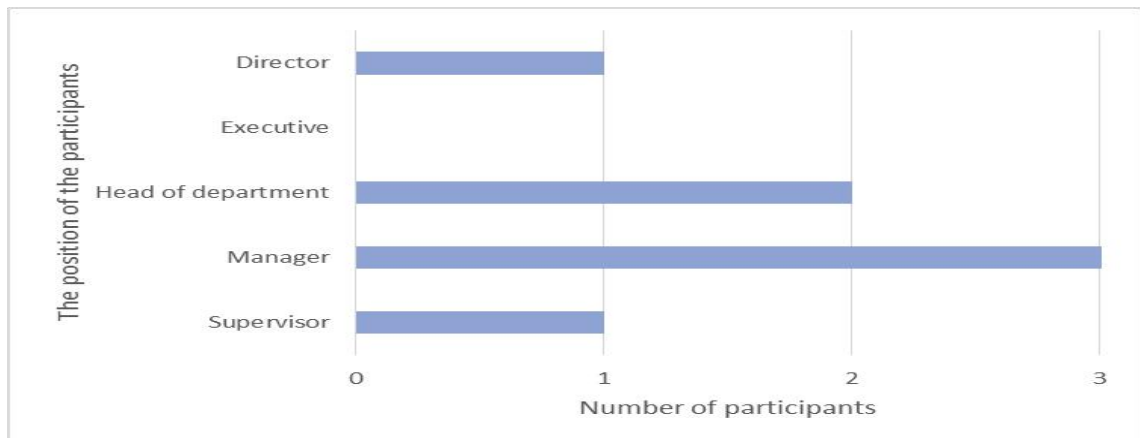


Figure 4.12: Positions occupied by TE participants

Figure 4.12 illustrates the occupations of TE participants. The results show four participants are managers, one is a supervisor, and one participant was a director. In addition, two participants are indicated as the heads of departments at TE.

4.4. Thematic analysis

The study collected primary data using in-depth interviews, with thematic analysis performed using NVivo version 12. The character and form of data collected were shaped by the research problem, research objectives, and study aim. A total of 15 interviewees participated in individual interviews; seven interviewees at BBSA and eight at TE. Thematic analysis is a methodology for analysing data collected in a qualitative study to interpret the data collected. It allows the researcher to form themes that contribute to the accuracy of the interpretations presented in a study (Castleberry & Nolen, 2018).

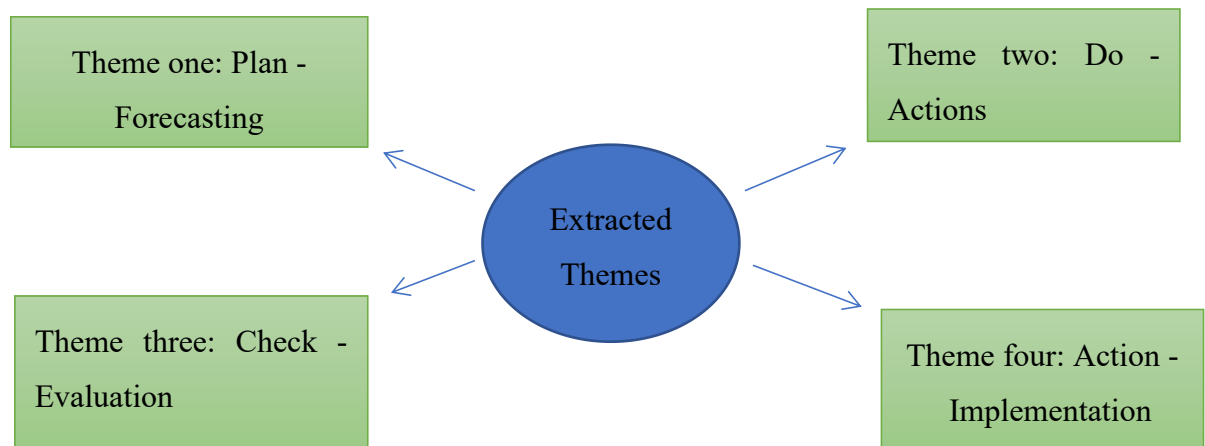


Figure 4.13: Categorising process

Source: Developed by researcher (2021)

Figure 4.13 presents all the relevant themes generated by the NVivo software during analysis of collected data. This study comprised four research objectives and developed four themes, which are presented and analysed in Table 4.1 below.

Table 4.1: Analysis of themes

Themes	Category	Objective
Theme one: Plan - Forecasting	Operations challenges: <ul style="list-style-type: none"> • Inadequate training • Lack of resources • Ineffective communication • Lack of commitment 	1
Theme two: Do - Actions	Causes of TQM operations challenges: <ul style="list-style-type: none"> • Training and education • Team-development • Quality management • Annual plan • Continuous improvement 	2
Theme three: Check - Evaluation	Strategies to assess the impact of COVID-19 <ul style="list-style-type: none"> • Implementing new systems • Implementing new process change • Training employees 	3
Theme four: Action - Implementation	Mitigation measures <ul style="list-style-type: none"> • Disruptive technologies • Communication platforms • Technology platform • Data management 	4

4.4.1 Theme one: Plan – Forecasting

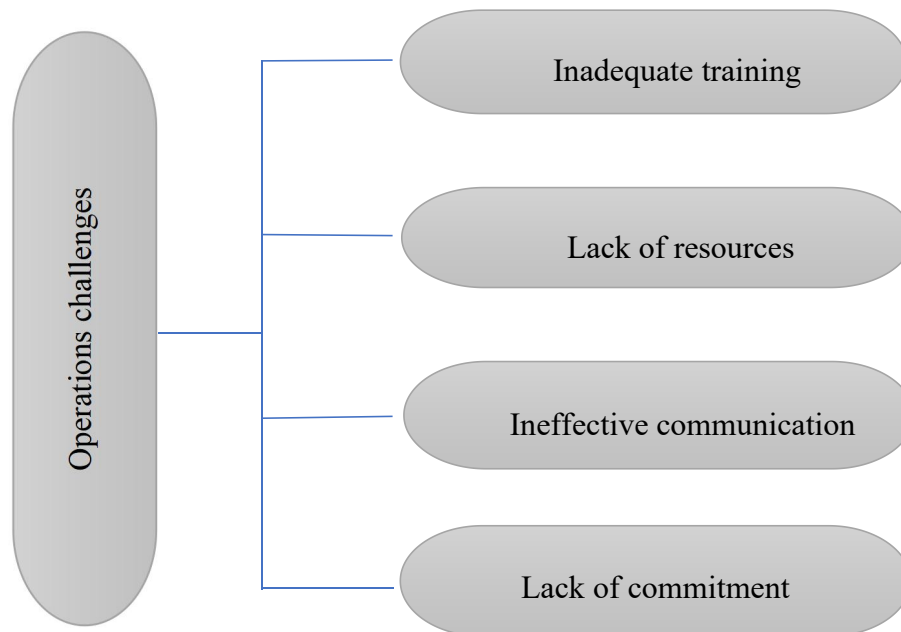


Figure 4.14: Operations Challenges

Source: Developed by Researcher (2021)

This theme determines the operations challenges faced by TQM with regards to planning at BBSA and TE, during the era of COVID-19. There are many ways to determine these challenges, and the research findings from the in-depth interviews revealed that at TE, challenges during COVID-19 include inadequate training of employees, lack of resources, and ineffective communication. Some participants at TE have intimated that a major challenge was the lack of resources.

This is supported by the following responses from the interview sessions:

"Inadequate training has resulted in the slow production because we are not familiar with new systems and processes in place" (P1, TE).

"Finding alternative sources for textile and accessories inputs takes time and delay production because of restrictions regarding transportation, and limit the availability of raw materials" (P3, TE).

At BBSA, commitment became the biggest quality operations challenge for employees, as many were retrenched and some were working from home. This is supported by the following responses from the interview sessions:

“The revenues dropped rapidly in 2020 compared to other years before” (P1, BBSA).

“The company reduced the working hours for the employees in response to the production slowdowns” (P2, BBSA).

4.4.2 Theme two: Do – Action

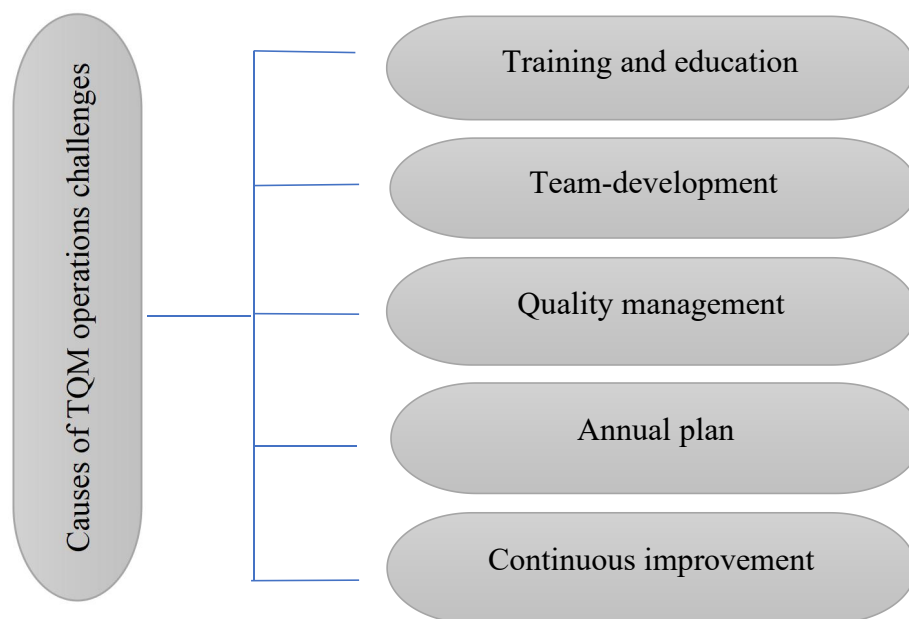


Figure 4.15: Causes of TQM operations challenges

Source: Developed by Researcher (2021)

This theme examines the causes of TQM operations challenges, and while there are many ways to examine these, the research findings from in-depth interviews have revealed that competition is very tight and, therefore, companies need to apply quality techniques in strategic management, including quality systems, quality assurance, and quality control. In other words, the companies are expected to implement the concept of TQM.

This is supported by the following responses from the interview sessions:

“At BBSA, they had examined the reasons by providing training and education to the staff and team development” (P6, BBSA).

“They are satisfied with team-based improvement activities that have contributed to high quality and productivity” (P7, BBSA).

Some participants revealed that TE has developed a quality committee to examine the reasons for TQM quality operations challenges in order to develop business management systems and ensure quality. In addition, some participants acknowledged the existence of an annual plan to improve product and service quality.

The following responses from the interview sessions supported this:

“The company is implementing quality management tools to ensure high customer loyalty, thus better business, increased cash flow, satisfied employees, healthy workplace and so on” (P6, TE).

“The company has an annual plan that sets the agenda for improvement in the upcoming years. The emphasis is on improving the quality of products and services and reducing waste” (P7, TE).

“Continuous improvement will result in a higher quality of products and services and improved employee satisfaction, which will satisfy their customers” (P8, TE).

4.4.3 Theme three: Check – Evaluation

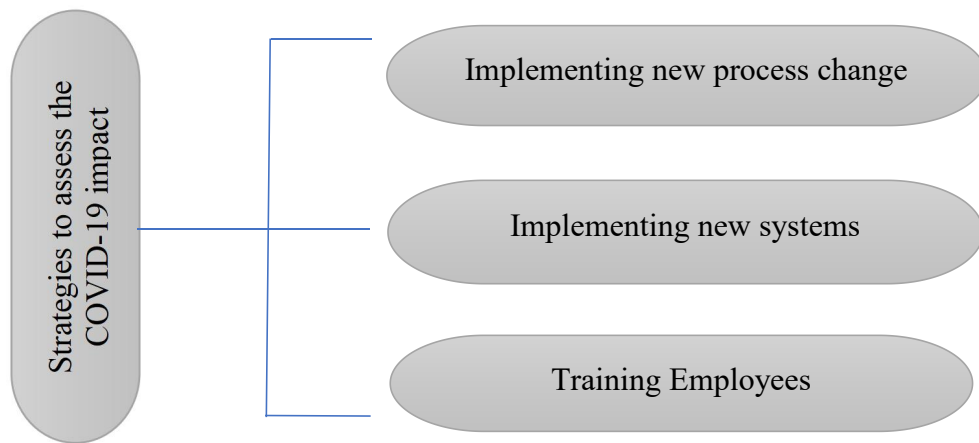


Figure 4.16: Strategies to assess the COVID-19 impact

Source: Developed by Researcher (2021)

This theme examines the strategies BBSA and TE employed in assessing the COVID-19 impact on TQM. The research findings from in-depth interviews revealed that TQM increases business efficiency and satisfies both customers and employees, because the company now has alternate suppliers. It makes sense then that new systems and process change led to an improved delivery process that increased the speed at which customers receive their orders, with no delays.

This is supported by the following responses from the interview sessions:

“Implementing new systems and processes change has increased business efficiency and satisfied both customers and the employees” (P3, BBSA).

“Implementing new systems and process change has achieved the desired results at TE. Training of employees has resulted in the fast productions of products and efficient service to the customers” (P3, TE).

4.4.4 Theme four: Act – Implementation

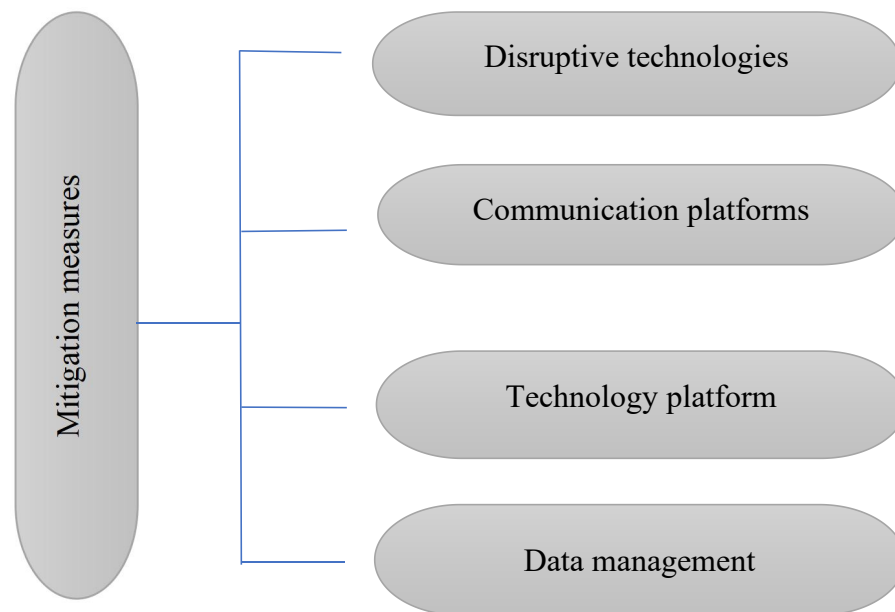


Figure 4.17: Mitigation strategies

Source: Developed by Researcher (2021)

This theme determines the mitigation measures employed by TE and BBSA to alleviate TQM operations challenges during the era of COVID-19. The research findings from in-depth interviews revealed that TE and BBSA employed mitigation measures that included disruptive technologies. Some examples of the technologies employed include knitting machines and 3D printers. The knitting machines, for instance, created knitted fabric in large swaths of materials instead of long strips.

The implemented mitigating measures, as supported by the following responses from the interview sessions include:

“Due to the COVID-19 pandemic, BBSA has accelerated the adoption of disruptive technologies to respond the crisis (P4, TE).

“Furthermore, to ensure the continuity of the business activities during COVID-19 related lockdowns and social distancing” (P5, BBSA).

“By using 3D printing in production, the company not only functionally optimise its products right from the start, but production steps such as cutting, sewing or gluing functional components to a textile can even be saved in this way” (P6, BBSA).

“As a result of COVID-19, the company uses technology platforms to support and engage with the pyramid base in their supply and distribution chains” (P4, TE).

Measure taken include communication platforms and data management, used to make online payments to suppliers and accurately trace supply chains. Nonetheless, some participants mentioned the mitigation measures taken to alleviate TQM operation challenges during COVID-19 engendered positive results. This is supported by the following responses from the interview sessions:

“Now ensuring continued access by offering products and services online” (P5, TE).

“The company has partnered with transportation companies that deliver products by using a motorcycle and, in some cases, not charging for delivery” (P6, TE).

4.5 Chapter summary

This chapter analysed data according to thematic analysis using NVivo version 12 and interpreted the results from TE and BBSA interview responses. The chapter started by revisiting the research objectives that guided this study, after which data were analysed and results obtained from the companies interpreted. The following chapter will provide findings and discussion based on the results obtained from BBSA and TE employees.

CHAPTER FIVE

FINDINGS AND DISCUSSION

5.1 Introduction

This chapter presents the findings and discussion based on the results of BBSA and TE. It deals with the research questions, relating them to the primary findings, in addition to what other studies found in that regard. The research questions start off the chapter and addressing them, based on the primary findings for both companies, and the secondary findings with some related literature.

5.2 Research Questions

- Which operations challenges are faced in TQM with regards to planning at TE and BBSA, during the era of COVID-19?
- What are the strategies employed by BBSA and TE in solving TQM operations challenges in the textile manufacturing sector?
- What are the strategies employed by BBSA and TE in assessing the impact of COVID-19 on TQM?
- What are the mitigation measures employed by BBSA and TE to alleviate TQM operation challenges during COVID-19?

5.3 Addressing Research Questions

This section addresses the research questions for both companies. Primary findings from the companies are stated and the secondary findings provided, relating each finding to the existing literature.

5.3.1 Research Question One

Which operations challenges are faced in TQM with regards to planning at Textiles Express and Best Branding South Africa, during the era of COVID-19?

I. Primary Findings

The research findings from in-depth interviews revealed the COVID-19 pandemic has resulted in serious challenges to the textile industry. Some challenges identified at BBSA include disruption of operations, reduction in sales, and delays in orders, while it was further found that revenues dropped more rapidly in 2020 than in previous years. Another finding revealed that commitment became the biggest quality operations challenge for employees, with many retrenched, and some working from home. Employee safety was essential at the workplace, therefore, employers reduced staff numbers to comply with government imposed COVID-19 rules and regulations, facing a lack of employee commitment in the production process as a result. Employees are those directed to the operation of production, and their commitment is essential for good quality of products.

It was further revealed from the interviews that challenges at TE during COVID-19 include inadequate employee training, lack of resources, and ineffective communication. Inadequate training has, therefore, resulted in decreased production as new workers were unfamiliar with new systems and processes in place. Some participants intimated a lack of resources, since finding alternative sources for textile and accessories inputs takes time, delays production because of restrictions regarding transportation, and limits raw material availability.

The findings additionally revealed that the BBSA also reduced employee working hours in response to reduced production. Some participants indicated the company shifted the production focus and concentrated more on producing face masks and other essential products in response to COVID-19 regulations. Working hours, prior to the COVID-19 pandemic, were from 08:00 am to 5:00 pm, and during the pandemic from 08:00 am to 3:30 pm, due to reduced production. The resulting lack of employee commitment was another quality operations challenge pointed out at BBSA.

This challenge was also acknowledged by some participants, who intimated employees showed less commitment, not only to quality, but also to the company; attributed to being afraid regarding the spread of COVID-19 in the workplace. As a result, many employees worked from home, some resigned, and some were retrenched.

II. Secondary Findings

This is consistent with findings from related literature. As Livingston, Desai and Berkwits (2020) observe, during the COVID-19 pandemic, many companies changed their production levels and started producing face masks and protective equipment kits, in order to survive financially. However, numerous companies had to stop production altogether and many employees lost their jobs due to the COVID-19 pandemic. Overall, many companies had to change their production levels (Horváth & Szabó, 2019).

Once production was allowed to resume, it should be noted that the company operated in level three of lockdown, which offered some leeway; nonetheless, much of what could be done remained restricted.

Where staff training is concerned, Kerksick *et al.* (2018) explain inadequate training as any training that does not meet the company's needs, in terms of quality and quantity. When a company identifies optimal training requirements, neither quality nor quantity can be overlooked. Furthermore, transportation links and distribution mechanisms were severely impacted, as observed by Cohen and Cromwell (2021), between suppliers, production facilities, and customers. This, in turn, resulted in the companies facing difficulties in repeatedly disinfecting the workplace to facilitate production.

Quality management can be explained as overseeing various tasks and activities within the company to ensure consistency in products and services offered (Mensah, 2020); it helps to maintain and achieve the desired quality in the company. One of the main aims of quality management is to ensure the company stakeholders work together to improve the products, processes, and culture to ensure customer satisfaction. However, the company also needs to understand the quality operations challenges and their root causes (Abbas, 2020).

5.3.2 Research Question Two

What are the strategies employed by Best Branding South Africa and Textiles Express in solving TQM operations challenges in the textile manufacturing sector?

I. Primary Findings

It was found from in-depth interviews that the more inclusive and collaborative the process is, the more the strategic plan accurately reflects the company's vision for the future. However, starting the planning process without gathering data usually destroys the company, making it necessary to review the facts and have adequate information about the company's status. The research findings additionally revealed appointment of the planning committee being done without much thought about their specific responsibilities, and without clearly defined expectations for participation. Finding the right employees to take part in the committee and an opportunity to take ownership is thus crucial to the company's success.

One of the viable solutions in place revealed by in-depth interviews is the prioritising of transparent communication. “It is more than anything because it builds trust amongst the employees and the stakeholders in the business” (P4, TE). Furthermore, it “helps the stakeholders to see how their inputs and ideas are captured through transparent updates” (P5, TE).

The interview findings also revealed that “being committed to making change is another viable solution currently in place on the strategic planning at TE” (P6, TE). Participants indicated they found it difficult to adapt to the changes in the company, brought about by the COVID-19 pandemic. Moreover, it was acknowledged that “for the strategic plan of the company to be successful, the leadership needs to commit to letting go of the outdated processes and rethinking their strategy” (P7, TE). The changes would help the company to adapt and avoid unnecessary disruptions in their operations during COVID-19.

The research findings from in-depth interviews have also revealed that “the activities put in place to support planning during the era of COVID-19 in operations planning are the production decisions, risk assessment, and mitigation” (P4, BBSA). Participants identified products and services they can deliver during the pandemic by considering demand and the adaptations required. Nonetheless, the interview findings revealed that “identifying critical resources is crucial support planning during the era of COVID-19. It includes critical materials, essential equipment, and critical skills of the employees” (P5, BBSA).

Added to this, “assessing suppliers and looking for alternatives is necessary during COVID-19 the pandemic on the operations planning” (P6, BBSA). During this era of COVID-19, the managers need to evaluate current operational processes and develop plans based on identified challenges. Therefore, activities are put in place to support planning at TE. The results revealed that “one of the activities is cross-training to develop skills and contingency plans” (P2, TE). The company must have activities for the essential equipment and technology, especially in dealing with remotely located employees. Furthermore, the findings from the interviews indicated that, “prioritising health and safety policies is required for employees to do their job safely” (P3, TE).

The results also showed that encouraging personal responsibility to follow recommended actions is a way of implementing the action plan and documenting relevant information to mitigate the COVID-19 impact. Nevertheless, emphasising “company and community responsibility to make sure employees and people have access to information and resources required” is one of the recommended actions (P2, BBSA). A plan of action can, furthermore, be implemented by “establishing a workplace system for providing up-to-date, reliable information to employees on emerging situations on COVID-19, in accordance with information released by national or local health authorities” (P4, TE). It can also be “implemented by encouraging the management’s commitment to reduce the risk of exposure to the virus at the workplace in consultation with worker representatives” (P5, TE).

II. Secondary Findings

This is consistent with findings from related literature. According to Rowan and Galanakis (2020: 141), “the company that is growing and hopes to sustain that growth needs a set of strategies to guide its program development, build a solid financial foundation, and prepare for challenges that lie ahead”. This means the strategy is essential. Ghobakhloo (2018) explains a strategic plan is a vision what the company’s future is hoped to be and the steps required to achieve that future. Therefore, a good plan should include objectives, goals, and desired outcomes. Some of the viable solutions observed on strategic planning at BBSA include creating a collaborative and inclusive process, informed operations, and setting up the expectation of shared responsibility and ownership.

Strategic planning is defined by Camilleri (2018: 117) as “a systematic process for developing direction of the company, articulates the objectives and actions required to achieve that future vision, and outlines metrics for measuring success”. Therefore, it is up to the managers to ensure they achieve the vision communicated to both stakeholders and employees in the strategic business plan. However, there is a viable solution to the strategic planning in place at TE. The company should also analyse current procedures and collect information (Clark & Vealé, 2018) that can be used to develop improvement strategies and specific measures for performance evaluation.

According to Kumar, Maiti and Gunasekaran (2018: 01), "TQM has been a popular business strategy in many leading manufacturing organisations over the past few years". It is also a method that involves both management and employees in continuously improving products and services. The companies adopted the concept of TQM to improve quality and reduce loss due to wasteful practices. However, there are many challenges in quality operations in the textile manufacturing sector, especially during the COVID-19 pandemic. This makes it essential to address the challenges faced in their operations and supply chains. The action plan is designed to be used by the company to reduce the impact of COVID-19 on the quality of products and services (Bhattacharya, Zutshi & Bavik, 2021). Some of the standard measures include physical distancing, wearing masks, and sanitising hands.

5.3.3 Research Question Three

What are the strategies employed by Best Branding South Africa and Textiles Express in assessing the impact of COVID-19 on TQM?

I. Primary Findings

The in-depth interview research findings revealed that investing in technology and infrastructure to support remote work and virtual collaboration capabilities is a measure that can be used to ensure the planning is adequate. The findings further revealed that one of the measures that can be used is to consider the systemic nature of pandemics when designing response strategies (P4, TE). Therefore, the company needs to change the boundaries of traditional resilience in order to address COVID-19 pandemic challenges. The companies must thus develop an understanding of their suppliers and alternate plans, such as insourcing strategies. It was also revealed that applying a people-first mind-set is one of the measures used at BBSA.

Additional findings indicated that implementing new systems and process change has increased business efficiency and satisfied both customers and employees. The delivery process has also increased the speed at which the customers receive their orders, and there are no delays because the company has alternate suppliers. The implementation of new systems and processes is an inevitable part of doing business, nonetheless, participants revealed this is not always embraced by employees, managers or business owners. Some participants, however, highlighted the implementation of new systems and process change achieved the desired results. Hence, the rapid shift towards interacting with customers through digital channels, for example, has a positive impact on sales.

Some participants revealed new systems implementation and process change have achieved the desired results at TE, where employee training resulted in fast production and efficient service to the customers (P3, TE). Some participants noted the company found alternate suppliers to provide raw material on time, which reduced the costs of raw materials because the suppliers are local (P4, TE). Furthermore, the new systems have encouraged employees to promote communication between themselves and management (P5, TE).

There are many benefits that the new systems and process change brought to BBSA. Some participants indicated some of the benefits to include consistency, clarity, and continuous improvement.

The consistent process provides consistent results. However, some participants revealed that developing the business processes to provide the right quality of output can deliver consistent quality in product or service (P4, BBSA). Furthermore, it is consistent in costs and profits. Moreover, some participants emphasised that writing down a business process or embedding a system offers all employees a greater degree of clarity about what is expected, what they need to do and what the required output is (P6, BBSA). Yet, new systems make it easier to review the business process required to be changed or updated. Therefore, learning from the practical experience of one person can be embedded in the business system to benefit all users for the future (P7, BBSA).

Some benefits include streamlining, focus, and control (P6, TE). Various participants revealed that it allows looking at other business systems in the company and identify areas where they can be streamlined, merged or steps removed that are now redundant (P7, TE). Moreover, effective business systems have clear, well-defined outputs and are constructed to deliver those through effective business modelling that focuses attention where most needed (P8, TE). Some participants indicated that these systems divert resources such as finance, time, and employees into those areas. Thus, instead of managing and controlling every activity only the systems need to be monitored and reviewed. Without the right business process management, it can be difficult to understand which key systems need to be regulated and controlled more closely (P5, TE).

II. Secondary Findings

The primary findings are consistent with results from related literature. According to Remko (2020:341), pandemic planning concerns need to be incorporated “into existing resilience management activities to provide a comprehensive response and to provide continuity for their most critical products and services”. However, there are measures of success that could ensure effective planning, specifically during unforeseen economic disruptions.

Identifying the chain of functions and activities along with interdependencies is thus crucial, with some of the activities and functions that include processes, data, technology, and facilities, as well as third parties.

Nam, Dutt, Chathoth and Khan (2021:454) observe that implementing new systems and changing processes can assist a business to “stay current with industry trends, which can make it more attractive to potential customers as well as help maintain current customers”. Hence, when competitors develop and implement new systems, the business can ensure it does not fall behind. In many instances, employees are hesitant and fear they may not adapt to change. Yet, process change and implementation of new systems in the business have a positive impact on its long-term success.

Effective business processes and systems provide numerous benefits to the company, customers, and employees (Wilson and Daugherty, 2018: 114). Therefore, to implement the systems and ensure the change process is effective, management should consider time, effort, and the required money. Attaran, Attaran and Kirkl (2019: 01) observe that implementing new systems and process change in the company can have the benefits of productivity and success, with some of the benefits highlighted to include streamlining, focus, and control (P6, TE).

5.3.4 Research Question Four

What are the mitigation measures employed by Best Branding South Africa and Textiles Express to alleviate TQM operation challenges during the era of COVID-19?

I. Primary Findings

Time was revealed as a resource needed to implement new systems and processes in the company, according to the research findings from in-depth interviews. Enough time assists the managers to appropriately plan for the systems and associated processes that need to be changed. Furthermore, a supporting team is also needed when implementing new systems and processes. While money is essential to run the business, once successfully implemented, the business will make profits (P1, BBSA).

Some participants revealed involvement of stakeholders, managers, and top management in the communication of necessary information about changes, demonstrating support to implement systems, and training employees in the change process.

The findings additionally indicated that the company must train employees to maintain a productive and safe environment, while developing the necessary skills and knowledge. Nevertheless, there are many staff training requirements for implementing and adopting a new action plan successfully. Some participants highlighted that one of the important staff training requirements is performance management training. It was felt managers and supervisors should receive this training to enable them to manage employee performance effectively (P4, TE).

Several participants revealed that one of the staff training requirements needed at BBSA is that of safety training. The Occupational Safety and Health Administration (OSHA) regulations require employers to train employees in the health and safety aspects of their jobs (P5, BBSA). Compliance with the applicable regulations is essential. Moreover, leadership training is required to implement and adopt the action plan successfully. It helps employees refine old skills and learn new techniques of leadership to enable running the departments with assertive communication and coaching (P6, BBSA).

According to the interview findings, training allows employees to strengthen their skills and build up knowledge. Furthermore, it elevates employees to a higher competency standard, to allow the team to share a common set of skills and knowledge (P3, BBSA). Moreover, training allows one employee to pick up where another left off, keeping them all on the same page without having to provide constant help and supervision (P4, BBSA). Hence, staff training can be thought of as the best insurance policy against all sorts of inevitable changes and unforeseeable needs that arise in the company from time to time (P5, BBSA).

The training endeavour has many strengths and opportunities, which enabled the team to respond to technical changes that affect their job requirements (P6, TE). In addition, training assisted employees in responding to changes that come from restructuring company operations (P7, TE). It allows employees and the managers “to facilitate career development and meet the need for continued growth”. As a result, the company has highly engaged employees, compared to other textile companies that do not provide training to their employees (P8, TE).

II. Secondary Findings

Findings from related literature concur with the primary findings. Makarius, Mukherjee, Fox and Fox (2020:262) find that, “an implementation process is important because it can provide a successful and replicable framework for changing or creating business processes”. As a result of COVID-19, new systems and processes are crucial for the business's survival, which requires the necessary resources for implementation to be successful. Some participants highlighted funds are one of the resources needed to implement new systems and processes in the business.

Implementing new systems and processes is fundamental to company development amid disruptions caused by the COVID-19 pandemic on operations and supply chains. However, it requires resources to implement systems and processes (Magableh, 2021). It is, therefore, necessary to dedicate resources to the implementation process, while it remains crucial for companies to adequately train employees to successfully implement and adopt action plans and maintain a productive workplace. However, training needs to be implemented that can aid employees succeed in the workplace.

5.4 Chapter summary

This chapter provided the findings and discussion based on data gathered through interviews with BBSA and TE employees. The chapter addressed each of the four research questions individually, based on the primary findings for both companies, and the secondary findings related to the review of literature. The next chapter concludes the study, offering areas for further study as well as recommendations from the research.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter concludes the study, with its aim to determine the COVID-19 pandemic impact on TQM in the textile manufacturing sector. The pandemic affected businesses in their operations; some companies were temporarily closed, and some, permanently. The impact varied across industries. In the textile manufacturing industry, businesses were affected in quality. Suppliers of raw materials saw their operations disrupted, and companies had to find alternate suppliers, which caused a delay in orders and affected sales. Therefore, the study found it necessary to develop different ways and strategies to help companies manage the impact of COVID-19. It would improve the textile manufacturing industry and enable the companies to successfully manage the effects of COVID-19 in their operations. The chapter starts with chapter summaries, then outlines limitations of the study, and areas for future research. Furthermore, it provides the recommendations and overall conclusion to the study.

6.2 Chapter summaries

The chapter summary helps the researcher provide an overall conclusion of the study and build recommendations based on the collected information from the participants in both companies.

6.2.1 Chapter One

The main purpose of this chapter was to give an overview of the study by articulating the problem to be solved and the methodology to be used to answer the research questions and objectives that emanated from the problem.

6.2.2 Chapter Two

The chapter summarised the literature reviewed and identified the gap the researcher aimed to address. The chapter mentioned the fundamental constructs of the literature review, which include TQM and its principles, the impact of past pandemics such as Anthrax of 2001, SARS of 2003, and Ebola of 2014 on TQM operations, and SCM and its components. The study was guided by the concepts of the PDCA cycle, which is the framework used in this study, with four phases: plan, do, check, and act.

6.2.3 Chapter Three

In this chapter the research methodology was explained as a set of systematic techniques used in research, with the chapter acting as a guide for the study and how it was to be conducted. The research methodology overview mentioned the research philosophy, design, and approach, along with the study site, target population, sampling strategies, and sample size, as well as data collection methods, data quality control, data analysis, ethical considerations, and study limitations. This study adopted interpretivism as the research approach, is qualitative, and followed the primary data to collect information.

The chapter highlighted that a qualitative approach was employed, as the research design is exploratory. However, the study was conducted in Durban at TE, based in Umgeni Road, and at BBSA, based in Sherwood. Seven employees were selected from BBSA to participate, with two from the demand and supply function, two from the supply chain function, and two from the sales and marketing. Moreover, eight employees were selected to participate at TE, with two from the demand and supply function, three from the supply chain function, and three from sales and marketing. This study applied primary data to collect data, and it was collected by using a semi-structured interview as measurement instrument.

6.2.4 Chapter Four

This chapter analysed data according to thematic analysis using NVivo version 12 to interpret the results from TE and BBSA. The chapter started by revisiting the research objectives that guide this study, followed by data analysis and interpretation.

6.2.5 Chapter Five

The findings and discussion based on BBSA and TE results were provided in this chapter. It discussed the findings of the research topic according to the data collected from the interviews and answered the research questions in correspondence with the research objectives. The chapter started with the research questions and addressed each based on the primary findings for both companies, and the secondary findings with some related literature.

6.2.6 Chapter Six

This chapter focuses on the conclusion and recommendations based on the results from interviews conducted at BBSA and TE. The chapter started with chapter summaries, followed by limitations of the study, and areas for future research. Furthermore, it provides the recommendations and overall conclusion to the study.

6.3 Study limitations

The limitation of this study was that it was only conducted in the textile manufacturing sector. The findings of the study cannot, therefore, be used in any other manufacturing sector, and only applies to the textiles companies. The study ensured the two companies had adequate information to meet the research objectives.

6.4 Areas for future research

This study was limited to the textile manufacturing sector focusing on the selected companies, situated in Durban. It is suggested that future research could be replicated to other companies within the manufacturing sector: automotive, pharmaceutical, petroleum, food processing, and so on. Furthermore, it is also envisaged future research would focus on operations and SCM challenges, since a gap exists in TQM implementation knowledge in the manufacturing sector, to improve the quality of products and services affected by the COVID-19 pandemic.

6.5 Recommendations

6.5.1 Companies need to stay informed

When companies stay informed about the COVID-19 situation, it would assist in making good decisions regarding business operations. The COVID-19 pandemic has been shown to rapidly evolve now and then; therefore, management needs to be updated regularly. For example, the companies can determine those operations challenges faced by TQM, with regards to planning, such as inadequate training, lack of resources, ineffective communication and lack of commitment. However, when the information is analysed, it is crucial to consider how the impact may affect the operations and supply chains. Some of the planning reports should also include updates on the spread of COVID-19 and what other companies within the textile industry are doing to manage the situation. This would, subsequently, indicate the effects on the supply of raw materials, availability of employees, and customer orders.

6.5.2 Securing cash flow (contingency budget)

The lack of finances has forced many companies to shut their operations, especially in difficult times, such as during the lockdown induced by COVID-19. However, even those companies in good financial standing need to ensure a sufficient flow of cash. Decline in revenue was mentioned as one of the challenges brought about by COVID-19, with many companies in the textile industry that experienced a rapid decline in revenue, because they were not operating. Domestic sales and the demand for textile products decreased drastically because of the panic situation created by the COVID-19 pandemic, where citizens were panic buying and stockpiling essential items. For a company to have a contingency budget would, therefore, depend on how long it takes for operations and the supply chains to return to normal. Putting such a budget in place should, however, be a priority of the companies, despite the disruptions caused by the COVID-19 pandemic on the operations and supply chains.

6.5.3 The companies need to communicate with their supply chain partners

Among all the difficulties created by the COVID-19 pandemic, communication is the key, because the company depends on internal and external stakeholders to operate successfully. Companies need to stay in touch with their stakeholders and maintain good working relationships; the employees are the most critical stakeholders of the company. This will help companies to examine strategies that can be employed in assessing the COVID-19 impact on TQM; for example, implementing new systems and process change.

Identifying strategies and communicating these to all supply chain partners not only assist a business to stay current with industry trends, it can also make it more attractive to potential customers, as well as help maintain existing customers. Management thus needs to provide transparent information required by employees to understand the crisis. Furthermore, transparent communications involve employees in discussions and encourage the contribution of innovative ideas to improve product and service quality. In addition, it incorporates the provision of guidelines to how they can maintain operations and production until the business returns to normal.

6.5.4 The companies need to set objectives and develop a resilient operations strategy

The situation might seem unclear because of the restrictions imposed by lockdown regulations; however, the companies need to determine their key objectives for the upcoming months. BBSA and TE should consider whether they wish to resume their operations or delay and reschedule until the COVID-19 pandemic improves and there is a return to normal operations. It stands to reason though that the companies need to devise an action plan for future operations and supply chains, regardless of their decision. The plan can help them deal with the present situation and to become resilient in their operations and supply chains. This would, furthermore, allow them to determine the best suited mitigation measures to alleviate TQM operations challenges during the era of COVID-19. These measures include disruptive technologies and communication as well as technology platforms.

When developing a resilient action plan, BBSA and TE need to identify their priorities, along with critical activities to keep the company going. Moreover, it is important to consider what is required to ensure the action plan is implemented successfully and improves resilience across all departments.

6.6 Conclusion

The study has determined the impact of the COVID-19 pandemic on TQM within the textile manufacturing sector. Businesses need to assess the COVID-19 impact, both financially and operationally, while addressing the needs of employees, customers, and suppliers. Responding to the pandemic has underscored the need for the companies under study to accelerate adoption of different ways and strategies to solve TQM operations challenges in the textile manufacturing sector. Different ways and strategies were identified and developed through the study that would assist companies to manage the COVID-19 impact, including implementing new systems and processes, training of employees, disruptive technologies, and so on.

The findings of this study aided in creating knowledge and socioeconomic value to the community. It increases public awareness and enables the community to understand the challenges affecting businesses. To date, implications for the textile manufacturing sector from the COVID-19 impact have been harsh, severely affecting growth of the textile industry, as many textile companies stopped production. The crisis has pushed businesses to make tough lay-offs, introduce pay cuts, and ask employees to take unpaid leave. It also affected the companies' supply chains, with retailers cancelling orders from suppliers because of government-imposed restrictions on travel. As a result, the companies in the textile manufacturing sector had no choice but to suspend both production and employees.

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8 Appendices

Appendix A: Interview Guide

INTERVIEW GUIDE

(Proposed interview time: 30 minutes)

Date: _____

Company: _____

Participant: _____

Research Topic:

An exploratory study of total quality management challenges during coronavirus disease: A case of Durban textile companies

University of KwaZulu-Natal

School of Management, IT and Governance

College of Law and Management Studies

Masters of Commerce (Supply Chain Management)

Researcher: Mr. K Mbele

Supervisor: Dr. E.D Ncube

Introduction

This research focused on Total Quality Management (TQM) as an operations challenge in the textile manufacturing sector during the era of Coronavirus disease 2019 (COVID-19). Customer satisfaction is the main driving force in TQM because everyone from the top management has to be involved. The primary intent of this interview is to accumulate information to improve the textile manufacturing industry and support the companies to manage better the effects of COVID-19 in their TQM and operations. The main research objective for this study is to ascertain the impact of COVID-19 on Total Quality Management (TQM) in the textile manufacturing sector.

Confidentiality will be applied to all responses provided.

SECTION A: BACKGROUND OF THE RESPONDENT

This section of the questionnaire refers to your background information. The information will enable me to compare respondents.

1. Company?

Textiles Express	
Best Branding South Africa	

2. Gender?

Male	
Female	

3. Age?

Older than 10 years old	
Older than 20 years old	
Older than 30 years old	
Older than 40 years old	
Older than 50 years old	

4. Race?

African	
Coloured	
Indian	
White	
Another-Group (specify)	

4. Your educational qualifications?

No formal qualification	
School leaving certificate	
Technical Diploma	
Graduate	
Post Graduate	
Undergraduate	
Other (Specify):	

5. How long have you worked in the organisation?

Less than 12 months	
More than 1 year but less than 2 years	
Over 2 years	
Over 5 years	
Over 10 years	

6. What is your position in the organisation?

Director	
Executive	
Head of Department	
Manager	
Supervisor	

SECTION B: INDIVIDUAL JOB PROFILE

1. Please provide a brief overview of your job description.

❖ Daily tasks or activities.

❖ Decisions to take on a daily basis.

2. Provide brief overview on your operations processes in the distribution centre.

3. Provide brief overview of operation changes and challenges in the Total Quality Management (TQM).

SECTION C

Theme One: Plan phase – Forecasting.

Which operational challenges are faced in TQM with regards to planning at TE and BBSA, during the era of COVID-19?

The following questions aim to gather information to determine the operations challenges of TQM with regards to planning during COVID-19 at Textiles Express and Best Branding South Africa.

1. Please provide an overview of the main challenges brought by COVID-19 in the TQM of the textile manufacturing sector.
2. Please clarify vital information needed to understand the challenges and their root causes.
3. Please provide an insight into some viable solutions in place on the strategic planning.
4. What are the activities that are currently in place to support planning during COVID-19 on the operations planning?
5. What measures of success can be used to ensure that planning is effective during unforeseen economic disruptions?

Theme Two: Do phase – Action.

What strategies are employed by BBSA and TE in solving TQM operational challenges in the textile manufacturing sector?

The following questions aim to gather information to examine what Textiles Express and Best Branding South Africa did with the causes of TQM operations challenges in the textile manufacturing sector.

1. How can the company implement the action plan and document the relevant information to mitigate the situation at hand during COVID-19?
2. If the action plan is successful, how will you amplify the success and share the results with supply chain partners?
3. If the action plan fails, how will you eradicate non-adding values that did what did not work and share the results?

Theme Three: Check phase – Evaluation.

What strategies are employed by BBSA and TE to assess the COVID-19 impact on TQM?

The following questions aim to gather information to ascertain whether Textiles Express and Best Branding South Africa did check to compare the impact of corona virus19 on TQM.

1. Did the implementation of new systems and processes change to achieve the desired results?
2. What is a new monitoring and evaluation tool/s employed to ascertain the results?
3. What are the advantages of the new systems and processes implemented?
4. Are there any limitations encountered during the collection of data that the change was effective?

Theme Four: Act phase – Implementation.

What mitigation measures are employed by BBSA and TE to alleviate TQM operation challenges during the era of COVID-19?

The following questions aim to gather information to determine the actions taken after failures caused by COVID-19 on TQM.

1. What are resources needed to implement the new systems and processes?
2. What are the staff training requirements for successfully implementing and adopting a new action plan?
3. Do you think the current action requires a contingency plan (plan B) to substitute the recent implementation?
4. What are the strengths and opportunities that were attained on those results of improvements?

I greatly appreciate your valuable time and input. Thank you

**UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS
COMMITTEE (HSSREC)**

APPLICATION FOR ETHICS APPROVAL

For research with human participants

Informed Consent Letter

**UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF MANAGEMENT, IT and GOVERNANCE**

M-COM Dissertation

Masters of Commerce (Supply Chain Management)

Researcher: Mr. K Mbele 217005992

Supervisor: Dr. E.D Ncube

I, Khulani Mbele (217005992) Masters student in Supply Chain Management, at the School of Management, IT and Governance in the University of KwaZulu-Natal invite you to participate in research project “Quality operations challenges in textile sector during COVID-19: A case of selected Durban companies”.

The main aim of the study is to identify the quality operations challenges in the textile sector during COVID-19 and provide recommendations of how best to overcome these challenges. The manufacturing sector plays a crucial role in the country's economy as it contributes to the GDP.

This study is expected to enrol 15 participants in total. There are seven employees selected at Best Branding South Africa to participate, for example, demand and supply function (02), supply chain function (two), sales and marketing (two). On the other hand, there are eight employees selected at Textiles Express to participate, for example, demand and supply function (two), supply chain function (three), sales and marketing (three). It will involve the following procedures: right to privacy, participation is voluntary and informed consent must be obtained.

The duration of your participation if you choose to enrol and remain in the study is expected to be 30 minutes. Risks to participants are minimized by using procedures that are consistent with sound research design and that do not unnecessarily expose participants. It includes conducting interviews, anonymity, and maintaining confidentiality. Therefore, maintaining confidentiality is a crucial measure to protect private information. This study maintains confidentiality by keeping records secure through passwords and encryption when sending data over emails.

Some of the benefits of participating in research includes gaining new information on the operations and have an opportunity to experience new knowledge in the textile sector. This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee.

In the event of any problems or concerns/questions you may contact the researcher at (076 937 0348), supervisor (031 260 8805) or the UKZN Humanities and Social Sciences Research Ethics Committee, contact details as follows:

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Your participation is voluntary, this allows you to refuse to participate or withdraw your participation at any time. Please note that confidentiality and anonymity of all data collected from you will be controlled by the School of Management, IT and Governance at the University of KwaZulu-Natal.

You are at liberty to question or raise concerns about your participation in this research project, and please do feel free to contact me or my supervisors for clarity.

I..... (Full names of the participant) have been informed about the study entitled “Quality operations challenges in textile sector during COVID-19: A case of selected Durban companies” by Khulani Mbele (217005992).

I understand the purpose and procedures of the study is to identify the quality operations challenges in the textile sector during COVID-19 and provide recommendations of how best to overcome these challenges. It provides procedures that are consistent with sound research design and that do not unnecessarily expose participants. It includes conducting interviews, anonymity, and maintaining confidentiality.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

I have been informed about any available compensation or medical treatment if injury occurs to me as a result of study-related procedures.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (provide details).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

**HUMANITIES and SOCIAL SCIENCES RESEARCH ETHICS
ADMINISTRATION**

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001
Durban
4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 - Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Signature of Participant

Date

Signature of Witness

Date

Appendix C: Ethical Clearance



02 March 2022

Khulani Mbele (217005992)
School Of Man Info Tech & Gov
Westville Campus

Dear K Mbele,

Protocol reference number: HSS REC/00003202/2021

Project title: Quality operations challenges in textile sector during Covid-19: A case of selected Durban companies

Amended title: An exploratory study of total quality management challenges during coronavirus disease: A case of Durban textile companies

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 15 February 2022 has now been approved as follows:

- Change in title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/ department for a period of 5 years.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

Best wishes for the successful completion of your research protocol.

Yours faithfully



Professor Dipane Hlalele (Chair)

/dd

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office: Westville Campus, Go van Mook Building
Postal Address: Private Bag 054001, Durban 4000
Tel: +27 31 260 8250 / 465 7 / 3287

Website: <http://www.ukzn.ac.za/Research-Ethics>

Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

Appendix E: Language Editor's Letter

Helen Richter
Advanced Editing, Proofreading
& Copy writing

hejrdng@gmail.com
072 9538199

31 March 2022

To whom it may concern;

CERTIFICATE OF EDITING & AUTHENTICATION

I have proofread and language edited the following Master's dissertation titled:

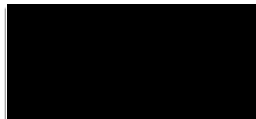
**"An exploratory study of total quality management challenges during coronavirus disease:
A case of Durban textile companies"**

By

Khulani Mbele

The work is the author's own work, to the best of my knowledge, and is free of spelling, grammar, and structural and stylistic errors.

With thanks,



H. S. Richter (Ms)
