

Evaluation of Factors Influencing Implementation of Total Quality Management in manufacturing: Case of Zambezi Portland cement in Ndola.

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Abstract

Implementation of total quality management has become critical area by many industries owing to the increasing competitive advantage of products and services. Total Quality Management is a management philosophy, which can gradually improve the way we conduct business. Nevertheless, Zambia as a less developed country is still in the infant stage of the TQM system. Manufacturing of cement companies do compose part of the main industrial structures in Zambia. The objectives of this research were; to establish the level of commitment to which management influences the implementation of TQM system at Zambezi Portland Cement; to investigate the role of customers on the implementation of TQM system in the company; to determine if 'plan, do, check and act' cycle is implemented at Zambezi Portland Cement.

The type of research design applied was a **non-experimental design**. This study utilized the qualitative research method. The target population

in this study constituted all employees of Zambezi Portland Cement.

The type of sampling design applied was **non-probability sampling design**, using convenience sampling. And also, from non-intervention studies, **exploratory** since it is on small scale as well as **descriptive** and **purposive** studies were utilized.

Operational definitions

Age: refers to how old somebody is.

Gender: refers to either male or female

Implementation of TQM system: Adoption of TQM in manufacturing sectors; commitment to quality standards, and holistic involvement of people in quality management.

Total Quality Management: This is management philosophy applied to attain competitive advantage in business environment.

Top management commitment: Refers to Management's commitment to implementing the TQM through leadership, provision of resources and work culture.

Introduction

Overview

The aim of the study was to evaluate the factors that influence the implementation of total quality management system (TQM) in the manufacturing of cement at Zambezi Portland in Ndola City.

These factors to be evaluated included; management's commitment; customer focus; and continuous improvement.

Background

As a preamble, customers demand products and services with greater durability and reliability at the most competitive price. This forces producers to strictly follow quality procedures right from design until delivery of the products. So, the goal of any competitive industry is to provide a product or service at the most economical costs, ensuring full customer satisfaction. This can be achieved through Total Quality Management (TQM), because, quality is not a technical function, but a systemic process extending throughout all phases of the business, such as; marketing, design, development, engineering, purchasing, production or operations. As per Feigebaum, "Total Quality Management is an effective system of integrating the quality development, quality maintenance and quality improvement efforts of various groups in an organization so as to enable marketing, engineering, production and service at the most economical levels which allow for full customer satisfaction" (Kumar, et al. 2008:168).

This chapter included the concept of quality and Total Quality Management (TQM) and its definitions, a brief history of TQM and its roots and transition from the concept of quality to Total Quality Management, quality gurus and their contributions, quality management approaches, models of TQM implementation, ISO 9000 and criticisms of TQM.

Oakland (2014) states that effective TQM implementation can be achieved through the 4 P's model. This includes; planning, performance, process and people. In a nut shell, the researcher will dwell only on four of the critical factors influencing the TQM implementation. These factors include: leadership commitment; customer focus; continuous improvement; and the competitiveness of manufacturing of cement at Zambezi Portland.

However, the role of external environment in encouraging TQM implementation and the obstacles of TQM implementation will also be given special treatment as well.

Any successful implementation of Total Quality Management (TQM) creates various benefits in an organization. However, in practice many companies fail to adopt and implement TQM. As such, there is need for a deeper and more systematic evaluation of the factors influencing TQM implementation. With this background, this study attempts to evaluate only four of the TQM Critical Success Factors (CSFs) at Zambezi Portland cement (Gholamreza et al. 2010).

Many organizations across the world have been ignited to employ new cultures to improve their organizational performance in order to flourish and compete in this dynamic business environment. Many of these philosophies have total quality management (TQM) at their core. TQM emerged in 1980s in the U.S.A, providing a structure for a competitive response to the growing dominance of Japanese manufacturers. Although there is much evidence in the literature of research being carried out in the first world economies, it is evident also that there is a limited amount of research being undertaken concerning TQM in less developed countries. Gosen et al. (2005:452) noted that: "A number of gaps are identified in the literature on quality management in developing

countries along with significant challenges including differing perceptions of quality”.

Total Quality Management (TQM), a core strategic management approach is designed for quality of any organization based on the employer and employees’ participation for customers’ satisfaction, competitiveness, flexibility and organization’s effectiveness, the study aims at evaluating the factors influencing the implementation of TQM (Gupta. K.S & Rokade. V, 2016).

Conceptual framework

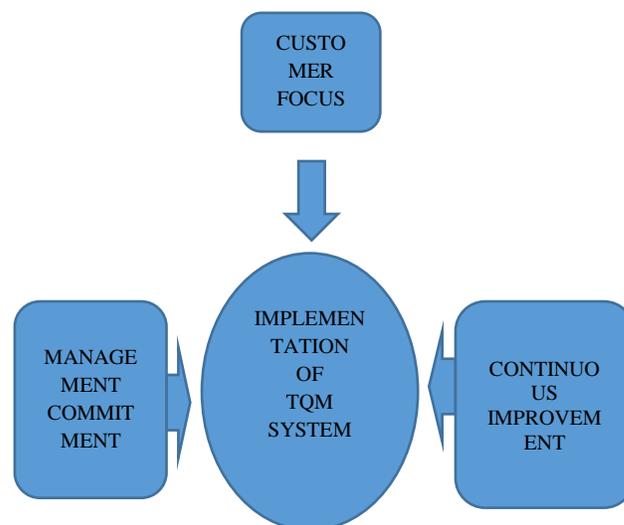
Based on an extensive review on previous literatures, a conceptual model was developed to show the relationship between the three variables and their influence on implementation of TQM as shown below. The variables were categorized into two groups:

[a] **Independent variable** - the key factors; independent variables are variables that are systematically controlled by the researcher to determine the variable’s effect on the outcome (dependent variable). In experimental research, we refer to independent variables as factors. A factor is an independent variable controlled by the researcher. Independent variables in experimental research have two or more levels: distinct amounts of an independent variable. Independent variables in experimental research are usually randomly assigned by the researcher such that research participants will receive a particular level of the independent variable.

[b] A dependent variable is the outcome measure in which researchers are interested. In correlational research, a dependent variable is sometimes called a criterion variable. To collect measurements of dependent variables, researchers observe, test, or survey the research participants. The dependent variable is what is measured by the

observation, test, or survey. Dependent variables can be collected in a variety of ways, including performance measures (for example, school grades, total sales), self-report measures (for example, attitudes, depression inventory), or physiological measures (for example, heart rate).

Dependent variable – organization’s implementation of TQM. The framework is linked to the implementation of TQM of the company. The proposed key factors consist of three areas: management commitment, customer focus, and continuous improvement. The implementation of each construct involved would result in a beneficial effect on the implementation of TQM. The intervening relationship is indicated by the arrow connecting the critical factors to the implementation of TQM of the company.



From this framework, the researcher proposed **Crosby’s Theory**, because this quality guru not only explained about quality but did exhaust other areas such as; attain total commitment from management; form a quality improvement team; create metrics for each quality improvement

activity; determine cost of quality and show how improvement will contribute to gains; train supervisors appropriately; encourage employees to fix defects and keep issues logs; create a zero-defects committee; ensure that employees and supervisors understand the steps to quality; demonstrate your company's commitment by holding a zero defects day; goals are set on day's schedule; determine root causes of errors, remove them from processes; create incentives programs for employees; create a quality council and hold regular meetings; as well as repeat from step one, which was in line with the objectives of this research.

Methodology

Overview

Research methodology is the general research strategy that outlines the way in which research is to undertaken and, among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means of data collection or, sometimes, how a specific result is to be calculated (Howell, K. E. 2013).

Research methodology is also defined as the holistic approach to the research process basically, from the theoretical point to the collection and analysis of the data (Collis and Hussey, 2003:55). The methodology followed in conducting this study included the specification of research design, sample design, questionnaire design, and data collection. SPSS software programme was also used in analyzing the collected data. That is, both Primary and Secondary data were applied in this study for the purpose of the method being adopted through the self-administered questionnaires. Primary data was gathered through the administered questionnaires to the staff of Zambezi Portland Cement (ZPC) of Ndola in order

to sample their opinions on the factors influencing the implementation of Total Quality Management (TQM) System.

The **reliability** of the primary data was subjected to the degree of confidence to which the results obtained were through the research method. On the other hand, the **validity** of the primary data is the degree of extent to which the method was used to evaluate the data in yielding the desired results. This accounted for both internal and external validity. The internal validity verified if the theory used generated the desired result of the research, whilst the external validity confirmed if the results generated in the research could be generalized. The data sampled was statistically analyzed using; graphs, tables, charts, and percentages to validate the results.

Research design

The main purpose of a research design was to detail the procedures for collecting and analyzing the data needed to accomplish the research objectives (Cooper & Schindler, 2014). This entailed specifying the type of information needed to answer the research questions, and testing the concept that had been proposed. It was a master plan of the study, to detail how the study was conducted. A research design was also a plan that described how, when and where data was to be collected and analysed (Parahoo 1997).

The type of research design applied was a **non-experimental design**, as the research was carried out in Ndola City without manipulating the elements. This, nonetheless, involved randomization.

Questionnaires were designed to collect data. These were distributed to the sample of participants from Zambezi Portland Cement in Ndola city.

This study utilized the qualitative research method. **Qualitative research** is a scientific method of observation to gather non-numerical data. This type of research "refers to the meanings, concepts definitions, characteristics, metaphors, symbols, and description of things" and not to their "counts or measures". This research answers why and how a certain phenomenon may occur rather than how often (**Babbie, Earl 2014:303**).

Howard, et al. (2012:3) argued that qualitative research aims at discovering the underlying motives and desires, making use of in-depth interviews in order to identify a problem and search for a positive solution to it.

Target population

The target population is the entire population, or group, that a researcher is interested in researching and analyzing. It is "the entire aggregation of participants that meet the designated set of criteria" (**Burns & Grove 1997:236**). The target population in this study constituted all employees of Zambezi Portland Cement. The target units were then the individual employees from six departments, and the company provided a list of employees' names which served as a sampling frame. This sample frame consisted of managers, supervisors and subordinates.

Sample size and sampling design

Sampling involves a process of selecting a sub-section of a population that represents the entire population in order to obtain information regarding the phenomenon of interest. A sample is a sub-section of the population, which is selected to participate in a study. There are two methods of sampling, one yields probability samples in which the probability of selection of each participant is assured. The other yields non-probability samples in which the probability of selection is unknown (**Saunders et al. 2016**).

Sample size

The company's employees were chosen by using a sampling frame within the cement plant. A **sampling frame** was then drawn from this target population. The sample size of fifty-five (55) employees was randomly selected. Only six (6) departments were chosen and given equal questionnaires. These departments included; Quality, Human Resources, Operations and Production, Sales and Marketing, Finance & Accounting, and Instrumentation and Measurements departments. From these departments, six key informants were selected.

Sampling design

The type of sampling design applied was **non-probability sampling design**, using **convenience sampling**, as convenience sampling involved selecting people for the research who were available or convenient for study. The advantage of convenience sampling is the ease with which participants can be recruited and from non-intervention studies, **exploratory** since it is on small scale as well as **descriptive** and **purposive studies** will be utilized.

Data collection methods and procedure

Data collection is a systemic way of gathering information, which is relevant to the research purpose or questions (**Burns & Grove 1997:383**). Data was collected in April and May, 2019. Data was collected using a structured self-administered questionnaire and a face-to-face interview.

Data collection instruments

Self-administered questionnaires and interviews were designed to collect the data. The questionnaire included; close-ended and open-ended questions. The instrument mostly used a five-point Likert Scale reflecting a range of attitude from strongly agree to the strongly disagree, coded as [5 = strongly agree], [4 =

agree], [3 = neither agree nor disagree], [2 = disagree], and [1] = strongly disagree]. Furthermore, a total of 55 questionnaires was distributed to the participants. Then, the secondary data was collected from published works. In order to draw conclusions, qualitative research method was utilized.

Data collection procedure

Data collection was done through secondary data analysis, questionnaires and by interview data collection mode. The questionnaire had close and open-ended questions.

Fifty-five questionnaires were distributed to the selected employees in each of the six departments. In order to ensure honesty of responses, the participants were free to answer the questions at their convenient time in anonymous way. This ensured that costs in terms of time were reduced. This provided consistency, as the questions were asked in a standardized manner.

Data analysis

Data analysis is “the systematic organisation and synthesis of the research data and the testing of research hypotheses, using those data” (**Polit & Hungler 1995:639**). It also entails categorizing, ordering, manipulating and summarizing the data and describing them in meaningful terms (**Brink 1996:178**).

During the progress of this research, data was collected through questionnaires from participants’ sample that ideally represented Zambezi Portland Cement in Ndola. Data collected was purely qualitative and was analyzed by descriptive analysis. The descriptive statistical tools such as Statistical Package for Social Sciences Version 20 and MS excel were applied to extract frequencies, and percentages. Questionnaires were coded for easy analysis by the computer. The findings were discussed and the data presented in the form of

frequency tables, pie-charts and bar graphs in chapter 4. These tables, graphs and figures were used to summarize responses for further analysis and facilitate comparison.

The questionnaires distributed would sort to find out the views of the participants on the factors that influence the implementation of TQM system in manufacturing of cement in the Company.

Results

The data for the study were analyzed using descriptive statistical tools such as; frequency, pie-charts and bar charts. The results showed that there were more men employed than women in the company. This information was based on an all representing sample group of participants from Zambezi Portland Cement. Of these participants the age demography showed that most of them employed were of the age group between 31 and 50 years of age whose professional qualifications were concentrated among those with Bachelors’ degrees and High school or equivalent. The company only had 9% participants with Postgraduates.

The implementation of TQM required that all levels of employees in an organization to be educated, well trained and able to analyze information and solve critical embargos that were faced at work place. Therefore, the level of education is vital indicator as to whether TQM can be employed successfully. This can also be considered as an indication of peoples’ responsiveness to TQM awareness. Therefore, it can be stated that with respect to the qualifications of the participants, these findings were quite thrilling. **Aole and Gorantiwar (2013)** have explained how Ishikawa extended the notion of quality to include the essential role that education played in the achievement of quality. Thus, he incorporated universal education in his seven QC

tools: (Ishikawa, 1985 cited in Aole and Gorantiwar, 2013).

Nevertheless, quality management is achieved through training, good communication and customer satisfaction in the company.

In accordance with the figures obtained, it can be observed that 57% of participants strongly agreed that investment return growth was high in the company, 41% participants agreed with investment return growth being high. Additionally, 61% of the participants agreed business growth rate was improving in the market. This is in line with literature review where David Joaquin Delgado-Hernandez in 2008 contended that the UK construction sector had been challenged to adopt manufacturing concepts to improve its performance. Total Quality Management (TQM) had been suggested as one approach that could bring about benefits to the industry. The information collected showed that the industry had begun to take up the challenge and, as a result, companies had won repeat business, increased their market shares and improved their customer satisfaction levels.

As evidenced by the figure, 50% of the participants strongly agreed the average number of defects was decreasing in company production. Actually, quality is conformance to requirements. The system of quality is prevention. The performance standard should be zero defects. These explain the absolute four qualities of TQM guru, Phillip Crosby, who is best known in relation to the concepts of "Do It Right First Time" and "Zero Defects". He considers traditional quality control, acceptable quality limits and waivers of sub-standard products to represent failure rather than assurance of success. Crosby, therefore, defines quality as conformance to the requirements which the company itself has established for its

products based directly on its customers' needs. He believes that since most companies have organizations and systems that allow deviation from what is really required, manufacturing companies spend around 20% of their revenues doing things wrong and doing them over again. This is why the research data based on the sample group used, 46% of participants strongly agreed with new improved and varied products and services being increased in the organization. When the quality systems are well managed, this can be proved through statistical results based on the questionnaires indicating 37% of the workers in company believing and agreeing an organized and encouraging environment engenders invention and creation in the company.

The findings from the case studies of Zambezi Portland Cement were presented in relation to the aims and objectives as set out in chapter one of this research. However, the researcher displayed only the research findings, the in-depth discussion and implications.

The main aim of this study was to evaluate the factors that influence the implementation of TQM system in the manufacturing of cement at Zambezi Portland in Ndola City. The objectives and analysis of this research were summarized as below;

How management's commitment influence implementation of TQM

Leadership is one of the basic and the most important needs in every organization. It is often considered as the solution to most organizational issues. It can direct human resources toward the strategic objectives of the organization and ensure that organizational functions are aligned with the external environment. One of the most essential factors contributing to leadership effectiveness is the style of a leader. It is among the important

components of a leader's leadership situation, which can cause success in organizations. Leadership style is the typical pattern of behavior that a leader utilizes to influence his or her subordinates to attain organizational goals (**Syed Hamid, Alnamer M., Fayez N. & Abdullah H. 2016**).

The concept of leadership for quality is emerged from the broader framework of leadership efficiency (**Latham, 2014**). Total quality leadership is the leadership that focuses on the mainstream of TQM implementation practices and outcomes. Total Quality leadership empowers, motivates, and creates values and innovation, based on TQM implementation (**Ulle & Kumar, 2014**). Leadership is a key element of TQM as it concerns the senior executives and management's involvement in building and maintaining an environment conducive for TQM implementation. This is critical as it unleashes unity of purpose, gives employees power to implement their ideas without seeking approval, and encourages change. It determines the successful implementation of other TQM constructs (**Toga Mainford, 2017**).

Leadership is the ability to positively influence people and systems under one's authority to make a meaningful impact and achieve important results (**Sila and Ebrahimpour, 2005**).

Senior management should define a clear vision, share (communicate) vision with others, encourage involvement and empower employees, lead, coach, and mentor and behave as a change agent (**Anjard, 1998**). Leadership in an organizational role also involves co-coordinating and balancing the conflicting interests of all members.

Management and assurance of quality is traditionally considered one of the powerful forces behind quality management (**Schalk and Dijk, 2005**). This had also been shown to be true at

Zambezi Portland Cement that through obligation to quality, management's commitment is likely to build, uphold and support an organizational context that leads to high organizational performance.

Management acts as the driver for TQM implementation, creating values, goals and systems to satisfy customer expectations and to improve an organization's performance (**Rad, 2006**) and responsible for providing direction and encouragement to the organization (**Walsh et al, 2002**). Management commitment is crucial for a company's quality development since, with their support and contributions, sufficient resources will be allocated to enhance the training activities resulting in better quality measurement, improved customer satisfaction and benchmarking.

The role of customers to determine total quality management system in the company.

Customer focus addresses customer needs and an expectation, which means that customer centered organizations, are better placed to produce products that are relevant to their customers. In order to satisfy customers' needs, wants and requirements, three fundamental criteria have to be achieved, which are quality, price and delivery. While delivery and price bear a short-term effect (**Hoyle, 2007**), quality lasts the customer for the longest period (**Oakland, 2014**). Therefore, nowadays quality is considered as the most important element of company's reputation. Research has shown that once faced with dissatisfaction in terms of quality, it takes long time for organizations to regain the trust of customers and often can lead to loss of customers (**Oakland, 2014; Chen, 2017**).

Studies conducted on the past literatures show that the main goal of TQM is to fulfill the needs of consumers. Therefore, the implementation of

TQM can be considered as a failure if value added service cannot be provided to the customers consistently (**Chen, C. M. 2017**).

One example is that of Zambian government that had difficulties in collecting tax. With the help of JICA, they adopted fishbone and quality control cycles in finding the root cause of this problem. They found out that taxes could not collect themselves. They had to collect it themselves. They also had to improve on their customer services as well as the tax collection environment. In Ethiopia, still with the help of JICA, The Kaizen's principles of 5S were adopted to improve the flow of people in workplaces, to put balance in assembly lines and to improve workplace layouts and to maximize space utilization. In the same country, a milling company managed to cut flour waste by 50 percent, a shoe factory found the most efficient way to cut leather (**JICA, 2012**).

In this case, customer relationship management is defined as the continual and persistent effort in maintaining a close relationship with customers by acquiring constant feedback from customers to ensure customers' needs and requirements are met (**Elshaer et al., 2016**). An organization should determine the current and future needs of customers and consider their needs as requirements for the whole organization (**Yusr et al., 2014**). This would result in more loyal customers and higher organizational performance (**Barouch et al., 2016**).

In order to fulfill the needs of the customers, Zambezi Portland Cement needs to focus on all criteria of products and services that contribute to the value and customer's satisfaction (**Hunt, 1995**).

To achieve these objectives, emphasis should be given to the interaction between the organization and their customers (**Flynn, 1995**).

From this interaction, the organization is able to determine the critical specifications for them to obtain vital information directly. One of the key philosophies of total quality management is that customers determine good quality. This means a company should structure all of its systems to create products and services that satisfy its customer base. Managers implement procedures based on what they observe from relevant markets. While detractors of this philosophy complain that it can raise costs by requiring more training and paperwork, proponents of this philosophy believe quality-driven processes lead to greater profits. Practitioners of total quality management believe effective systems are those that change according to customer needs. Instead of breakthroughs in which there is instant change, however, this philosophy encourages evolutionary change. Managers must monitor the markets and allow culture to determine which kinds of products and services they provide as well as how they determine which tools and systems to incorporate. Likewise, all employees are encouraged to give feedback regarding workflow systems, which can also lead to change (**Uduk, 2015**).

Peter Drucker has said "a business is not defined by the company's name, statutes, or articles of incorporation. It is defined by what the customer satisfies when he buys a product or service. To satisfy the customer is the mission and purpose of every business." The question "what is our business?" can therefore be answered only by looking at the business from the outside, from the point of view of the customer and market. What the customer sees, thinks, believes, and wants, at any given time must be accepted by management as an objective fact. To the customer, no product or service, and certainly no company is of much importance. The customer only wants to know

what the product or service will do for him tomorrow. All he is interested in are his own values, his own wants, and his own reality. For this reason alone, any serious attempt to answer, "what our business is" must start with the customer, his realities, his situation, his behaviour, his expectations, and his values." (Uduk, 2015).

It is widely advocated that quality is determined by both internal and external customers. A strong competitive advantage is driven by customer wants and needs.

Customer focus is thus an organizational orientation toward satisfying the needs of potential and actual customers. It is essential to know what customers want and what products or services to be provided to meet their requirements (Taylor and Wright, 2003).

Achieving customer focus involves ensuring that the whole organization puts its customers first.

All activities, from the planning of a new product to its production, marketing, and after-sales care, should be built around the customer so as to maximize customer satisfaction at lowest possible cost (Anjard, 1998).

Operations management today pays close attention to the demands of quality, customer service, and competition. The process begins with attention to the needs of customers: What do they want? Where do they want it? When do they want it? Based on the answers, managers line up resources and take any action necessary to meet customer expectations.

To determine if 'plan, do, check and act' cycle is implemented at Zambezi Portland cement.

However, implementation of TQM principles cannot be efficient, if it is not a continuous and integrated process in the company, which is constantly reviewed and changed (Ross, 2017).

The philosophy of TQM is built from the principle of continuous improvement of the entire team in the organization to meet customer's needs (Benavent et al. 2005).

Nderitu and Nyaoga (2013:4) explain that customer satisfaction can be achieved through determined continuous improvement processes that can only be created by developing quality services. 'Constant innovation, improvement and change are stressed,' which leads 'into a cycle of continuous improvement (Sallis, 2002:25). This process involves planning, execution and evaluation (Nderitu and Nyaoga, 2013:4). To develop a continuous improvement environment management needs to trust their staff to plan and develop quality principles within their own environment. (Sallis, 2002:25). Although TQM is management-directed, employees must be involved with the designing, monitoring and evaluation process.

TQM is mainly concerned with continuous improvement in all work, from high level strategic planning and decision-making, to detailed execution of work elements on the shop floor. It stems from the belief that mistakes can be avoided and defects can be prevented. It leads to continuously improving results, in all aspects of work, as a result of continuously improving capabilities, people, processes, and technology and machine capabilities (Khurram Hashmi, 2019).

Continuous improvement must deal not only with improving results, but more importantly with improving capabilities to produce better results in the future. The five major areas of focus for capability improvement are demand generation, supply generation, technology, operations and people capability.

A central principle of TQM is that mistakes may be made by people, but most of them are caused,

or at least permitted, by faulty systems and processes. This means that the root cause of such mistakes can be identified and eliminated, and repetition can be prevented by changing the process.

There are three major mechanisms of prevention: preventing mistakes (defects) from occurring (mistake-proofing or poka-yoke). Where mistakes cannot be absolutely prevented, detecting them early to prevent them being passed down the value-added chain (inspection at source or by the next operation). Where mistakes recur, stopping production until the process can be corrected, to prevent the production of more defects (**Khurram Hashmi, 2019**).

To achieve excellent quality results the organization must have a continuous improvement approach. Continuous improvement is a 'value system stressing that processes can be improved' and that improvement is 'an integral part of every employee's job' (**Heizer and Render, 2014: 675**). The process involves every individual making some small improvement in practice to seek 'total perfection' (**Heizer and Render, 2014:675**). Continuous improvement is a conscience effort of knowing mistakes made and improving on the mistakes. TQM envisages 'a permanent shift in an institution's focus away from short-term expediency' to the 'long-term quality improvement' (**Sallis, 2002:25**). Continuous improvement implies a commitment to constant examination of the technical and administrative process in place of improved processes (**Nderitu and Nyaoga, 2013:4**).

Continuous improvement is one of the strategic focus of TQM as it places the method of measuring and controlling its activities which is geared towards achieving customer's requirements (**Weijermars 2011**).

It is a process that tends to improve business perfection and increase competitive advantage (**Goetsch and Davis 2006**) and it is an on-going process. Continuous improvement identifies and reduces the waste generated in the process or system targeting to achieve standard through continuous social, economic and environmental improvement (**Nejati and Nejati 2010**).

In other words, continuous improvement is not a specific agenda but a continuous journey that involves every element of the organization involved.

As reported in the literature review, there are many evidences that show continuous improvement can have positive impact on the performance (**Li et al. 2003**).

One technique for quality improvement is to evaluate progress regularly. This requires setting goals ahead of time to know by which standards you will make judgments. The evaluation should include managers looking at sales numbers, product life cycles, and the effectiveness of marketing campaigns to ensure there is not too much waste and profits are where they should be. Proponents of quality management will often get feedback from lower-level employees as well. Collect information from those who deal with customers on a regular basis for insight on what clients expect. The 21st century technological advancement has created quality awareness which has gained significant acceptance in manufacturing system. This has, however, caused manufacturing sector to improve in quality, productivity and competitiveness through efficient management of process for value creation in the highly dynamic market (**Matthews, et al., 1991**).

This statement is further supposed by other authors who have stated that, TQM has significantly contributed to sustainable growth of

manufacturing industries with strategic advantages in order to improve competitive abilities of the firms through a strong and positive impact on industrial performance (**David & Gunaydin, 1997**).

Therefore, TQM as a management approach will enable Zambezi Portland Cement to focus on value creation hence becoming a source of sustainable competitive advantage across the globe.

Continuous improvement refers to a philosophy whereby organizations, and the individuals within it, undertake continual improvements of all aspects of organizational life.

Bergman and **Klefsjö (2003)** argued that a constant endeavour to fulfil and preferably exceeded customer needs and expectations at the lowest cost by continuous improvement work, to which all involved were committed, focusing on the processes in the organization.

Continuous improvement can be implemented through the proper allocation of resources and training and use of quality tools for problem solving (**Sila and Ebrahimpour, 2003**).

Assessment, reward and recognition systems can be established to promote efforts towards continuous improvement (**Sila and Ebrahimpour, 2005**).

Continuous improvement is a powerful concept or factor related to the pursuit of never-ending improvement in meeting external and internal customer needs (**Schalk and Dijk, 2005**).

Kanji points out that continuous improvement require management by facts and commitment of all employees with an emphasis on teamwork to promote a bottom-up thrust for quality improvement (**Kanji, 1998**).

Continuous improvement is the philosophy of improvement initiatives that increases success and

reduces failure and must be integrated into the management of all systems and processes (**Vouzas & Psychogios, 2007**).

Conclusion of the study

In conclusion, the outcome of the reviewed literature revealed that when management commitment, customer focus, and continuous improvement are fully implemented there will be better achievement of the implementation of Total Quality Management at Zambezi Portland Cement. The research findings also showed that TQM is a strategic tool the company can employ in the quest to remain competitive. It was also discovered that for the TQM to be effectively and efficiently implemented, everybody in the company should be involved and committed from the top management level to the subordinates having the customers as the main focus. Also, the findings of this research as well as the one reported in literature support the idea that the management of the organization has a major role to play in terms of ensuring a culture which permits every member of the organization to be involved and contribute to quality improvement, as the involvement of employees in detecting and monitoring the quality performance requires a decentralized organizational structure. This structure permits for innovation as it permits everybody in an organization to seek solution to a particular quality problem.

The company should implement and follow procedures accordingly on improving quality. There is need to apply the tools that have been proved to work and commit all the energy towards it. When management is committed, the employees too are able to implement the work efficiently and effectively.

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TABLES AND FIGURES

Interpretation of data collected

During the progress of this research, data was collected through questionnaires from participants' sample that ideally represents Zambezi Portland Cement in Ndola. The questionnaires distributed sort to find out the views of the participants on the factors that influence the implementation of TQM system in manufacturing of cement in the Company.

Table 4.1 Questionnaires distributed and collected

A total of 55 questionnaires were distributed to the sample, of which 46 completed questionnaires were received for the final analysis representing a response rate of 84 %. Out of which, 9 (16%) of the questionnaires were excluded from the analysis and were not returned to the researcher. Table 4.1 illustrates the number of questionnaire respondents and response rate. This high response rate could be attributed to the efforts applied by the researcher and the level of interest of the subject matter.

The number of Participants and Rate of Response

DESCRIPTION	PARTICIPANTS	RATE OF RESPONSE
Questionnaires distributed	55	100%
Total Usable	46	84%
Unusable	9	16%

Table 4.1

Gender distribution of sample size

Questionnaire question: What is your Gender?

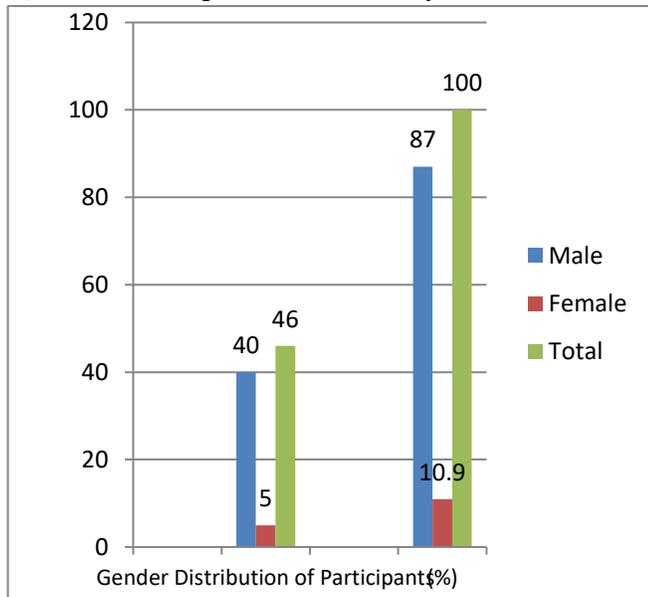


Figure 4.1

From the figure above, it can be seen that of the 46(100%) participants that made up the sample, 40(87%) were males and 5(11%) were females.

Table 4.3: Age distribution of the sample size

Questionnaire question: What is your age?

	Frequency	Percent
Less than 30 years	6	13.0
Between 31 – 50 years	32	69.6
Above 50 years	8	17.4
Total	46	100.0

Only six (13%) participants were below thirty (30) years of age, thirty-two (70%) were of the age group between thirty-one (31) and fifty (50) years of age. Another group of eight (17%) participants were above fifty (50) years of age.

Figure 4.3: Highest levels of Educational qualification of participants

Questionnaire question: What is your highest level of Educational qualification?

Table 4.4

	Frequency	Percent
High school or equivalent	17	37.0
Bachelor	24	52.2
Postgraduate	4	8.7
Total	46	100.0

The educational qualification of the participants composed of seventeen (37%) having High School or equivalent, twenty-four (52%) having Bachelors' degrees. The category of others took up 9%, which from the sample results composed of Masters' degree holders, and finally one (2%) other said had other qualification.

Table 4.5: Current position of Participants' position held.

Questionnaire Question: What is your position in the company?

Your current position

	Frequency	Percent
TQM Employee	5	10.9
TQM Manager	20	43.5
TQM Supervisor	21	45.7
Total	46	100.0

Table 4.5

From the figure above, only five (11%) participants were TQM employees. TQM managers were twenty (44%) in total, twenty-one

(46%) participants said they were TQM Supervisors.

Table 4.6: Management Levels of Participants' positions held.

Questionnaire Question: Which is your level of management in the company?

	Frequency	Percent
Top Level management	1	2.2
Middle Level Management	31	67.4
Lower Level Management	14	30.4
Total	46	100.0

From the figure above, only one (2%) of the participants was from top management. Middle management officers were thirty-one (67%) in total and fourteen (30%) participants said they were from the lower management level.

Table 4.7: Length of Employment in the Incumbent Company

Questionnaire question: For how long have you been working with your current company?

	Frequency	Percent
Less than 5 year	13	28.3
Between 5 – 10 years	31	67.4
Between 10-20 years	2	4.3
Total	46	100.0

The figure indicates that thirteen (28%) participants, are those that have been working with the company for less than five (5) years and those

with five to ten (5–10) years' work experience are thirty-one (67%). Lastly, two (4%) of the participants say they have worked in the company for a period of time, between ten and twenty (10 - 20) years.

Levels of TQM satisfaction

Questionnaire question: Describe your current TQM satisfaction?

The pie chart below shows that 87% of the participants said they are satisfied with their TQM. About 7% said they are both very satisfied and cannot say respectively. More than 50% of the participants are satisfied with their current levels of TQM.

Table 4.8 Number of years of your personal involvement in quality management issues

	Frequency	Percent
Less than 3 years	7	15.2
3 – 6 years	27	58.7
7 to 10 years	11	23.9
More than 10 years	1	2.2
Total	46	100.0

The figure says 15% of the participants, are those that have been personally involved in quality management issues for less than three (3) years and those with three to six (3–6) years indicate 59% in such quality issues. Eleven (11) participants say they have been in it for a period of time, from seven to ten (7- 10) years. Lastly, those covering more than ten (10) years had 2% of the participants in total.

Type of Company ownership

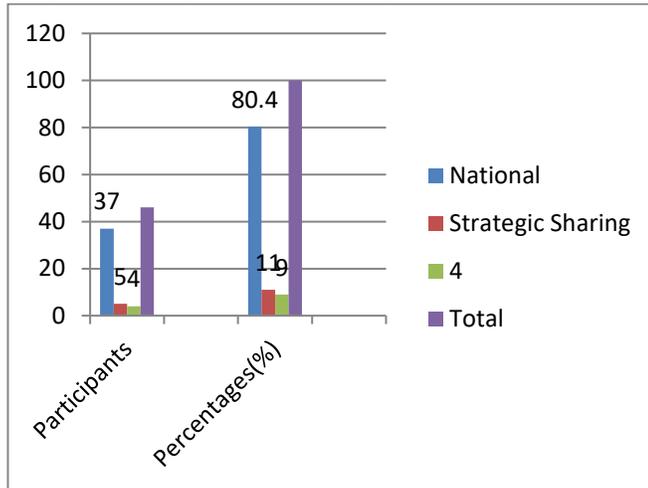


Figure 4.5

Of the total number of participants, 80% said the company type of ownership was national. The other 11% said it was a strategic type of sharing. While the rest of the 9% were indifferent.

Standardization of TQM Programme in Organization

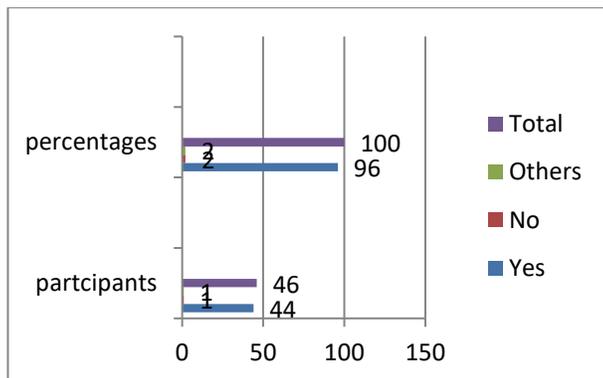


Figure 4.6

From the total number of 46 participants, 96% say there is Standardization of TQM programme in the Organization. The other 2% say there is no standardization of TQM programme at their work place. The remaining 2% seem not to be sure.

Figure 4.7 Does the company have access to training facilities?

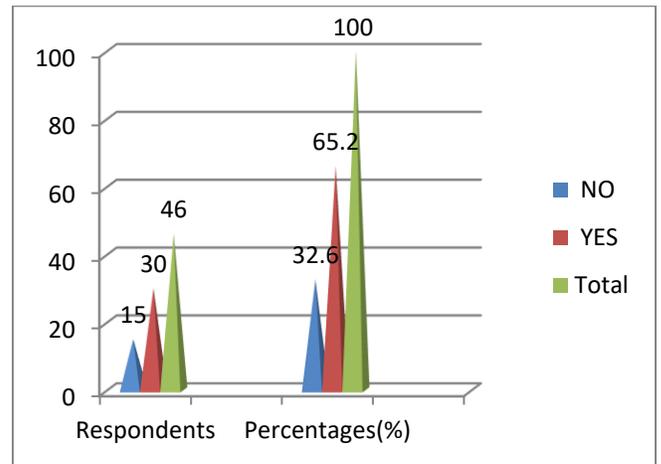
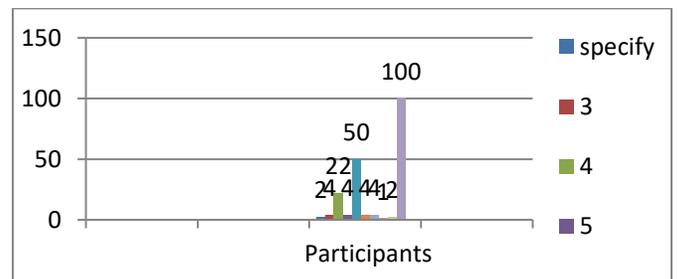


Figure 4.7

65.2% of the participants said the company has access to training facilities. The other 32.6% of the participants said they are not. 2% of them are not sure.

Figure 4.8 How long has the quality certification been used



From figure 4, it is evident that 50% of the 46 participants said quality certification has been used in the company for a period of 6 years. 22% said four years. 4% had other frequencies in mind in accordance with the practice at their places of work. These other frequencies mentioned include: 3, 5, 7, 8, and 10 years respectively, and finally others did not specify.

Figure 4.9

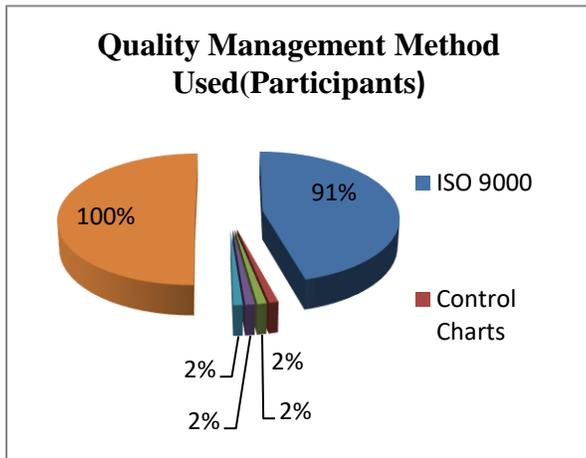


Figure 4.9

Statistical results based on the questionnaires say that 91% of the workers apply the ISO 9000 series as a quality management method in the organization, while the other 2% believes control charts, in-line inspection, outgoing quality and rest respectively are methods that are used.

Table 5.1 Which TQM key factor has been implemented in your company?

	Frequency	Percent
Continuous improvement	16	34.8
Top management commitment	9	19.6
Quality measurement and benchmarking	1	2.2
Suppliers relationships	1	2.2
Policy and strategic planning	5	10.9
Quality information systems	3	6.5
Organizational culture	1	2.2
Customer focus and satisfaction	8	17.4
Quality communications and structure	2	4.3
Total	46	100.0

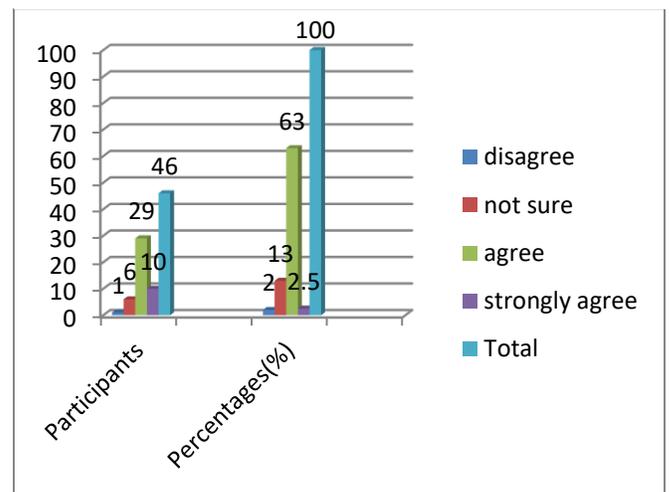
This table displays a summation of rankings of different participants. According to this figurative illustration, the most TQM key factor is the continuous improvement (35%), thereafter follows top management commitment (20%), then customer focus and satisfaction (17%), then policy and strategic planning (11%), followed by quality information systems (7%), then quality communications and structure (4%) follows after. Finally, the least factors found to be implemented in the company were quality measurement and benchmarking, suppliers' relationships and organizational culture (2%).

Top Management assumes active responsibility for the evaluation and improvement

Figure 5.0

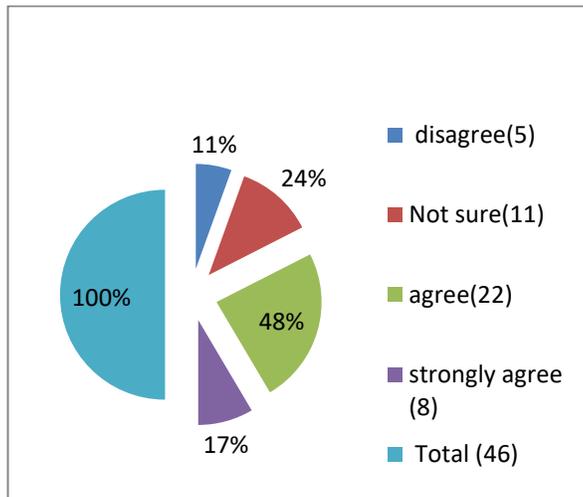
As evidenced by the figure above, 9% of the participants are unsure, the other 52% merely agree. On the other hand, 39% of the respondents strongly agree that Top Management assumes active responsibility for the evaluation and improvement.

Figure 5.1 Senior management committed to quality



According to the bar chart illustrated in figure above, 63% of the participants agree that senior management is committed to quality, 3% strongly agree to this assertion. 2% of the participants merely disagreed. Further 13% were not sure.

Figure 5.2 There is an inclination of top management to allocate adequate resources and time for quality management efforts



According to the pie chart illustrated in figure, 48% of the participants agree that there is an inclination of top management to allocate adequate resources and time for quality management efforts, 17% strongly agreed to this assertion. 11% of the participants merely disagreed. Further 24% were not sure.

Figure 5.3 Major elements of quality management structure are in place to facilitate the organization's quality strategy objectives.

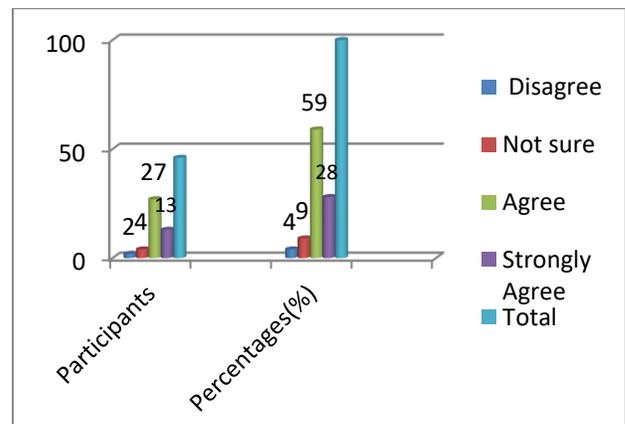
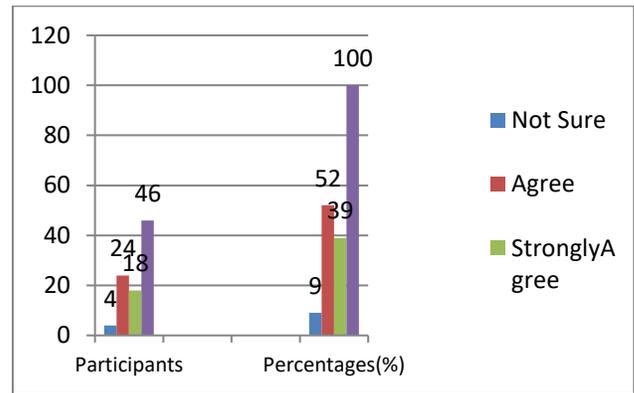


Figure 5.3

The chart illustrated in figure, 59% of the participants agree that major elements of quality management structure are in place to facilitate the organization's quality strategy objectives, 28% strongly agree to this assertion. 4% of the participants merely disagreed. Further 9% were not sure.

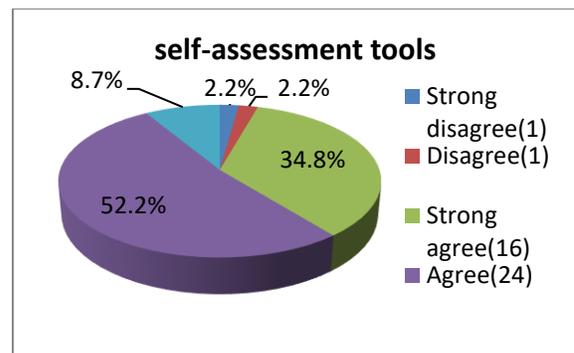


Figure 5.4

According to the pie chart illustrated in figure 5.4, 52.2% of the participants agree that there is a use of self-assessment tools and other mechanisms to track and improve performance gaps in the implementation and effectiveness of systems, practices and processes, 35% strongly agree to this assertion. 2.2% strongly disagreed. A further 2.2% of the participants merely disagreed. Further 8.7% were not sure.

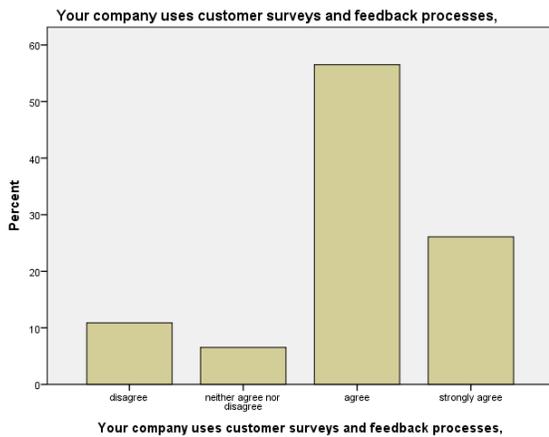


Figure 5.6

The chart shows that, 56% of the participants agree that their company uses customer surveys and feedback processes, 25% strongly agree to this assertion. 12% of the participants merely disagreed. Further 5% were not sure.

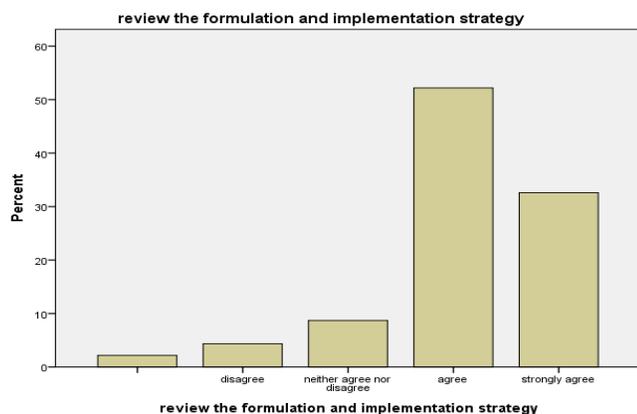


Figure 5.8

The illustrated in figure indicates that 52% of the participants agree that the company reviews the

formation and implementation strategy, 30% strongly agree to this assertion. 4% of the respondents merely disagreed. Further 10% were not sure.

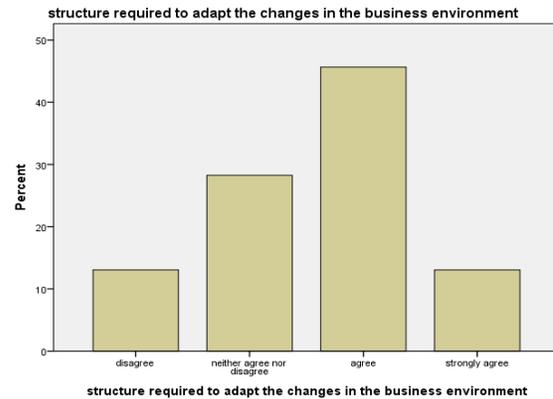


Figure 6.0

The chart illustrated in figure 4. Indicates that 46% of the participants agree that structure is required to adapt the changes in the business environment, 14% strongly agree to this assertion. 13% of the participants merely disagreed. 28% were not sure.

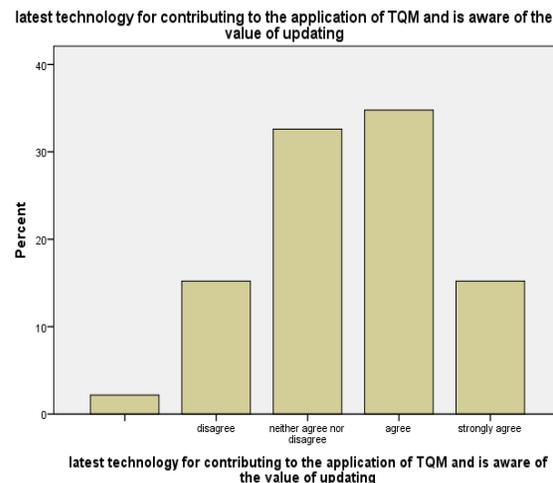


Figure 6.1

This chart illustrates that, 35% of the participants agree that the company avails to them the latest technology for contributing to the application of TQM and they are aware of the value of updating, 15% strongly agree to this assertion. 3% strongly

disagreed. Another 15% of the participants merely disagreed. Further 33% were not sure.

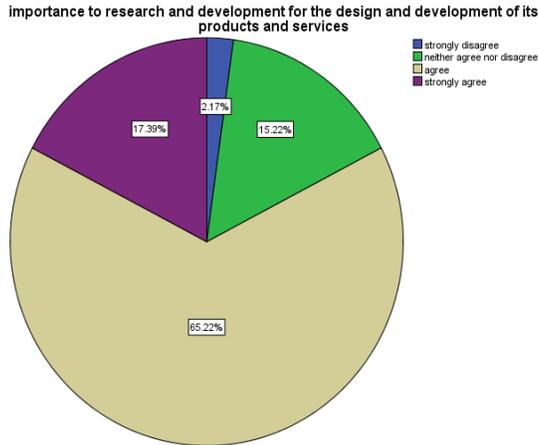


Figure 6.3

As can be seen from the pie chart above, based on the sample group used, 65.22% of the participants agree with the importance to research and development for design and development of its products and services, 15.22% neither agree nor disagree. 17.39% strongly agree and 2.17% strongly disagree with above quality factor.

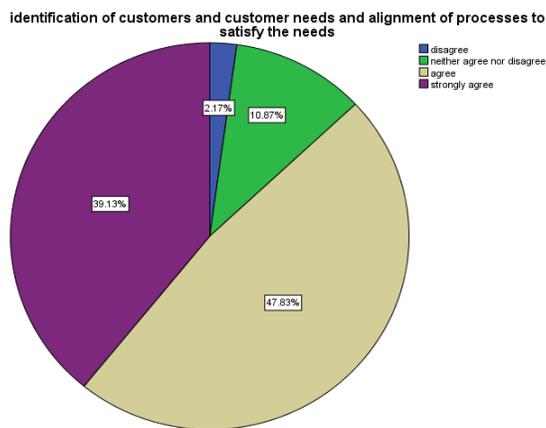


Figure 6.4

In accordance with the figure above, it can be observed that 47.83% of participants agreed to the identification of customers and customer needs and alignment of processes to satisfy the needs, 39.13% participants strongly agreed to this quality

factor. 10.87% participants neither agreed nor disagree and 2.17% disagreed to the identification of customers and customer needs and alignment of processes to satisfy the needs.

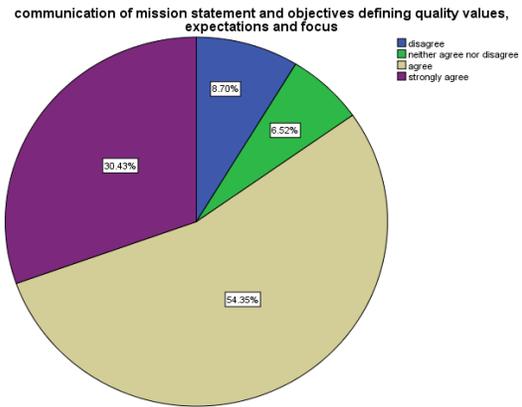
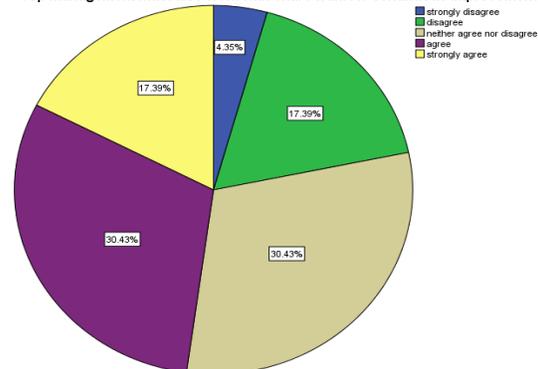


Figure 6.5

Table 6.3 The average number of defects is decreasing in company productions

	Frequency	Percent
neither agree nor disagree	2	4.3
Agree	21	45.7
strongly agree	23	50.0
Total	46	100.0

Top management must also work with entire team for continuous improvement



The pie chart indicates that 54% of the participants agreed that communication of mission statement and objectives define quality values, expectations

and focus. 30% said they strongly agree with the above statement. 9% others disagree with it, of which 7% of the sample neither agree nor disagree.

Figure 6.4

The pie chart shows that 4% of the participants said they strongly disagree that top management must also work with entire team for continuous improvement. 17% said they strongly agree with it. On the other hand, a total amounting to 30% of the participants agreed, and 17% of them disagreed. The other 30% neither agreed nor disagreed.

Table 5.9 New improved and varied products and services are increasing in your company

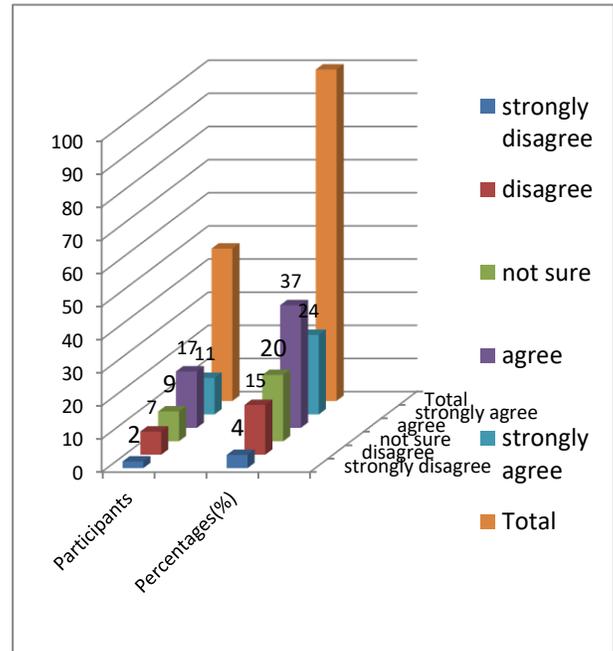
	Frequency	Percent
Disagree	3	6.5
neither agree nor disagree	2	4.3
Agree	20	43.5
strongly agree	21	45.7
Total	46	100.0

As can be seen from the figure above, based on the sample group used, 46% of participants strongly agree with new improved and varied products and services being increased in the organisation, 44% merely agree. 7% disagreed and 4% neither agreed nor disagree.

As evidenced by the figure above, 4% of the participants neither agree nor disagree, the other 46% merely agree. On the other hand, 50% of the participants strongly agree the average number of defects is decreasing in company productions.

Figure 6.5. An organized and encouraging environment engenders invention and creation in the company

Figure 6.6



Statistical results based on the questionnaires say that 37.0% of the workers in company believe and agree an organized and encouraging environment engenders invention and creation in the company, while the other 4.3% strongly agree, 19.6% neither agree nor disagree as 15.2% disagree.

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