



Empirical Analysis of the Implementation of (TQM) in the Production of Smocks in Northern Ghana for Sustainable Development

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Abstract: Total Quality Management (TQM) is a system that focuses on customer satisfaction through a notion of continuous improvement. This conception emerged decades ago to develop and increase quality management strategies. TQM is considered indispensable in any business performance improvement, and thus the need for organizations to adopt and implement. It is an integrated system of methods, principles, and best practices that provide a framework for organizations to strive for excellence in everyday processes. As a result, organizations are looking for ways of spending less and producing more. The implementation of TQM is acknowledged as a fruitful management philosophy, particularly in the manufacturing industry. The main thrust of TQM is focusing on customer satisfaction and remaining operationally efficient. The current study attempts to empirically analyse the implementation of TQM in the design and production of indigenous textiles (smocks) in Northern Ghana for sustainable development. To keep the study within manageable scopes, the study focused on indigenous textiles (smocks) producers in Northern Ghana hence, the research approach used was both descriptive and exploratory. The study was conducted using the mixed methods approach as the strategy for data collection. The data collection instruments included self-administered questionnaires as well as interview protocols. Thus, a total sample size of 120 individuals in the smock production value chain was selected conveniently from Northern Ghana who design and produce indigenous textiles (smocks). This was made up of 80 individuals involved in the actual production of smock whereas the remaining 40 were smock consumers. The SPSS was employed to analyse the quantitative data. The findings of the current study suggested that the implementation of TQM brings several benefits for businesses. These benefits can be realized in business operations, customer satisfaction and retention and adaptability to changing or emerging market conditions. Such changes were noted as improving business operations, elimination of defects and waste, higher profitability, and increased job security among others.

Keywords: Empirical Analyses, Implementation, TQM, Smock Production, Sustainable Development

1. Introduction

The global competition and market dynamics have placed companies under tremendous pressure to satisfy their customers, reduce costs and increase their service level. The textile industry in Ghana as part of the country's history, has been a strategic source of affording employment opportunities to many of its populace, Quartey [1]. Tetteh [2] there is a need for an approach that firms that design and produce indigenous textiles (smock) can use to advance their internal

processes and increase customer satisfaction. If this is properly carried out, it will lead to decreased costs related to corrective or preventative maintenance, better overall performance, and an increased number of happy and loyal customers. Consequently, there are many tools and strategies that organisations employ to achieve these goals. The implementation of Total Quality Management (TQM) is one of the strategies that can be executed by these companies to remain competitive in the market place. TQM has been a popular business strategy in many leading manufacturing

firms over the past few years. However, some companies have experienced successes, and while others have failed with TQM implementation, Ross [3]. Successful firms understand the dominant impact customer-defined quality can have on their operations. Consequently, countless competitive businesses incessantly increase their quality standards. Although several businesses are interested in TQM implementation, the percentage of firms that have a successful TQM initiative is not very high, Ross [3].

1.1. Definition of Quality

The definition of quality is contingent on the role of the persons defining it. Most consumers find it problematic to define quality, nonetheless, they recognize it when they see it. The struggle in describing quality exists irrespective of product, and this is right for both manufacturing and service organizations. Further complicating the problem is that the connotation of quality has changed over time, Evans and Lindsay [10]. At present, there is no single universal description of quality. Some perceive quality as performance to standards. Others understand it as meeting the customer's needs or satisfying the customer.

Kafetzopoulos *et al.* [5], infer that quality is a philosophical concept that lacks a general theory in the literature. For instance, Mortimore and Stone [6] identified four (4) uses of the term quality. According to them, quality is an attribute; a degree or relative value; a description of anything good or excellent, and a non-qualified trait. Ellis [7] Equated quality to standards that must be met to realize particular purposes to the satisfaction of customers. Harvey and Green [8] identified the ensuing distinct but interrelated ways of understanding quality as follows:

1.1.1. Quality as Fitness for Purpose

The main issue here is, whose purposes are to be fulfilled? Conformity with institutional missions as well as the capacity to meet customers' requirements is the primary viewpoint. There is widespread agreement on the critique that 'fitness for purpose' alone is too broad an interpretation of quality. Hence the need to complement it. The analysis of quality as the fitness of purpose linked to the adequacy of the quality - related intentions of an organisation provides a check on fitness for purpose.

1.1.2. Quality as Exceptional

This idea is similar to the traditional and elitist academic opinion that views quality as being unique, and distinctive. In educational terms, it epitomises excellence, high-level performance and passing the last set of standards unattainable. In this view, quality is achieved if the standards are surpassed.

1.1.3. Quality as Perfection

Quality, in this case, is seen as a consistent or flawless outcome. It centres on the specification of processes. The interrelated concepts of zero defects also culminate in getting things right the first time. This idea is grounded on the premise that if consistency can be realised, then quality would be achieved as a matter of course. This dimension of quality is

invariably applicable in manufacturing since they aim at delivering equal or defect - free products.

Quality as value for money: This view identifies quality in terms of return on investment. This opinion embodies efficiency, effectiveness, and accountability. It focuses on how the process efficiently uses the inputs in a manner that they can produce the desired outputs.

1.1.4. Quality as Transformation

This relates to the notion that views quality in terms of the transformation of products from one state to a different state.

There is also an emerging debate in the literature on the view of quality as a culture, Mauch [9]. This view appreciates the significance of the organisational view of quality as a process of change, where each establishment is concerned with and recognises the significance of quality. This way of conceptualisation is related to the intrinsic traits of businesses in which quality is considered as a driving force behind what everybody does in an organisation. Mauch [9] explain that quality culture is not likely to be constructed irrespective of the context in which it is located. From the above, it can be noted that quality is a construct, and its meaning is contextual. The various opinions on what constitutes quality are rooted in the values and assumptions of the different authors about nature, purpose and fundamental processes involved. Relative to a product such as appeal the ensuing has been established:

1.1.5. Conformance to Specifications

Which measures how well the product meets the targets and tolerances determined by its designers. For instance, in garment manufacturing, the dimensions of a garment-facing may be detailed by its design engineers as 2.05 inches. This would imply that the target dimension is 2 inches; however, the dimensions can differ between 1.95 and 2.05 inches. This instance demonstrates, conformance to specification and is directly measurable, although it may not be directly linked to the customer's indication of quality, Mortimore and Stone [6].

Fitness for use - which emphasises how well the product performs its anticipated function or use. For instance, an 'A' shape and flared skirt both meet fitness for use description if one considers covering their nakedness as the projected function. Nevertheless, if the description becomes more precise and assumes that the envisioned use is for wearing to an evening occasion, the flared skirt has a superior fitness for use.

1.1.6. Value for Price Paid

Which is a characterisation of quality that consumers frequently use for product or service practicality. This is the only description that amalgamates economics with customer standards. Value for price paid assumes that the meaning of quality is price sensitive. For instance, if one desires to sign up for a personal sewing workshop and realised that the same class is being trained at two different institutions at significantly different training rates. If one takes the less expensive workshop, one will think that one has received superior value for the price.

1.1.7. Support Services

This depends on how often the quality of a product or service is judged. Quality does not relate only to the product or service itself; it also relates to the individuals, processes, and organisational environment related to it. For instance, the quality of a garment manufacturing company is judged not only by the quality of staff and training but also by the efficiency and accuracy of sewing.

1.1.8. Psychological Criteria

These are a subjective description that centres on the judgmental assessment of what constitutes product or service quality. Varied dynamics contribute to the assessment, including the atmosphere of the environment or the perceived stature of the product. For instance, the garment sown may be of average fit. However, a very welcoming salesperson may leave an imprint of high quality.

1.2. Cost of Quality

Quality has gained much prominence because companies have realised the high cost of poor quality. Quality affects all aspects of a firm and has dramatic cost consequences. The most ostensible implication arises when poor quality produces disgruntled customers and ultimately leads to loss of business Mauch [9]. Evans and Lindsay [10] is a method of quantifying the full cost of quality-related efforts as well as deficiencies. Preceding its primer, the common view was that higher quality necessitates higher costs, either by procuring superior materials or equipment or by engaging more labour.

Besides, while cost accounting had developed to classify financial transactions into revenues, expenses, and shifts in shareholder equity, it had not endeavoured to catalogue costs pertinent to quality. By categorizing quality-related records from a business's general ledger, management as well as quality managers can assess investments in quality based on cost enhancement and profit improvement, Foley [8]. Nonetheless, quality has several other costs, which may be classified into two groups. The initial category comprises costs essential for realizing superior quality, which are termed quality control costs. These come in two categories: prevention costs and appraisal costs. The second category consists of the cost consequences of poor quality, which are termed quality failure costs. These include external failure costs and internal failure costs. The initial two costs are incurred in anticipation of preventing the second two Mauch, [9].

1.2.1. Prevention Costs

These are entire costs incurred in the process of preventing poor quality from arising. They comprise quality planning costs, including the costs of developing and executing a quality plan. Further included are the costs of product and process design, from gathering consumer information to designing processes that accomplish conformance to specifications. Staff training in quality dimensions is included as a portion of this cost, as well as the costs of preserving records of information and data linked to quality, Hackman

and Wageman [11].

1.2.2. Appraisal Costs

These are incurred in the process of detecting defects. They consist of the cost of quality inspections, product testing, and performing checks to ensure that quality criteria are being met. Further included in this group are the costs of worker time expended in measuring quality and the cost of tools employed for quality appraisal Hackman and Wageman [11].

1.2.3. Internal Failure Costs

These are costs associated with realizing poor product quality before the product gets to the final consumer. One category of internal failure cost is rework, which is the cost of rectifying the faulty item. Occasionally the product can be so defective that it cannot be rectified and must be discarded away. This is termed scrap, and its costs comprise all the material, labour, and machine costs expended in manufacturing the defective product. Other kinds of internal failure costs consist of the cost of equipment downtime owing to failures in the process and the costs of ignoring defective products to recover value, Liker [12].

1.2.4. External Failure Costs

These are connected to quality glitches that arise at the client site. These costs can be mostly detrimental because customer confidence and loyalty can be challenging to redeem. They comprise everything from consumer grievances, product returns, and maintenance, to warranty claims, recalls, and sometimes litigation costs resulting from product liability concerns. A final element of this cost is lost sales as well as customers. External failure may occasionally put a firm out of business almost abruptly. Firms that consider quality vital invest greatly in prevention and appraisal costs to avert internal and external failure costs. The earlier defects are discovered, the less costly they are to correct, Liker [12].

1.3. The Total Quality Management Concept

The quality management concept can be a mystifying conception due to distinct criteria based on roles in the sequence of events which are established on a person's standpoints within the value chain. Hackman and Wageman [11] defined quality as the degree of excellence of something as measured against another comparable thing. Nevertheless, within the business setting, quality is connected to product and service features and consumer satisfaction. It can differ according to diverse viewpoints including customer and organisation perspectives, as inferred by Feigenbaum [13] quality is the features through which a product or service meets the expectations of the shopper.

While quality encompasses product and service features, quality management deals with the operation process and organisation and signifies the realisation of quality. Quality is considered to have three (3) key constituents, quality assurance, quality control and quality improvement Crosby [4]. Quality management is grounded on a zero-defect philosophy. This philosophy focuses on averting unintended

errors by understanding the high cost of quality defects and thinking incessantly about where faults might arise to avert these errors if possible, to afford high quality and quantity products or services within the lowest budget, thus increasing customer satisfaction and improving firm reputation Boaden, [14]. TQM is a management tactic that has become prevalent since the early 1980s when it turned out to be an influential technique of competitiveness. According to Deming [15]. TQM is an organisation event encompassing everybody in a corporation in an entirely systemic and combined effort toward refining performance at all levels. These integrations lead to improved customer satisfaction by controlling quality, costs as well and product development. According to Van der Wiele and Dale [13] TQM is based on a continuous achievement of consumer satisfaction, through the integration of management and worker commitment, preparation, continuous improvement and good supplier relations. Total Quality Management is defined by Eskildson, [16] as a continuous process of improvement for persons, groups of individuals and the entire organisation. A quality section in an organisation is based on incorporating all organisational functions. As well as focusing on satisfying customer requirements to realize organisational aims, which can be reached by affording personnel with the needed preparation towards being self-inspired and controlled to come up with innovative concepts and approaches to undertaking the work and dealing with customers to afford a high-quality service.

According to Hellsten and Klefsjo, [17] TQM is related to the organisation itself and is perceived as an incorporation between the technical, social and human structures in any organisation. Thus, its impact on an organisation's status and client satisfaction. Thus, all sections have to amalgamate to advance the organisation's effectiveness, competitiveness, and structure. David [18] pointed out that there are several descriptions and clarifications of TQM due to the varied perceptions of quality however, they specify that TQM is the shared cooperation of everybody in an organisation and linked with business processes to offer value for money for products or services which meet and confidently surpass the requirements and expectations of consumers. David, [18] indicates that TQM includes all facets of quality management for organisations, comprising suppliers, consumers and personnel, and their amalgamation with the crucial business process. Furthermore, TQM necessitates all organisations to apply TQM philosophies in every division and at every level, with an equilibrium between technical, people and managerial matters. Hence, all departments have to integrate to attain the necessary outcome of the TQM implementation. Dahlgaard and Dahlgaard [19] points to four (4) fundamental features on which the TQM philosophy is centred these include worker involvement, empowerment and ownership, continuous improvement, consumer focus and employment of management commitment, where TQM is the basis of numerous undertakings, including management and employee commitment, meeting consumer desires, improvement teams, decreasing development cycle time, worker involvement and empowerment as well as strategic planning. David, [18]

stipulates that TQM is a management function targeted at refining effectiveness, competitiveness and liveness through strategic planning, management and worker involvement and process improvement. TQM must be a way of thinking and carrying out a job, and this includes all persons within an organisation, by refining communication and employee involvement to influence and advance quality positively. Deming [15] asserts that TQM is a technique by which management, as well as workforces, can be involved in the continuous improvement of the production of goods or services. TQM is considered a management philosophy, intended to decrease losses and increase business outcomes.

Furthermore, TQM is based on an amalgamation of management tools and seeks to incorporate all organisational functions to emphasise meeting organisational aims and consumer expectations and requirements. Consequently, there is no single, explicit theoretical formalisation of TQM, as specified by Dahlgaard and Dahlgaard, [19]. Deming [15] infer that organisations need a quality system and quality culture. They offer the fundamental assumptions of TQM as a discipline and philosophy of management which organises, plans and unceasingly advances activities in which management and personnel have to contribute to increasing processes and outputs.

Consequently, TQM is presented differently and from different standpoints. TQM descriptions differ from country to country, based on national as well as organisational culture and perception of quality, and the prerequisite of that culture. Generally, nonetheless, it is understood as a management philosophy, and the majority of scholars relate the core role of TQM implementation to the management level of commitment towards quality improvement. TQM is a shared responsibility in an organisation intended to create value-for-money products or services to meet and exceed consumer needs and expectations, Magnusson and Bergman [20]. It has been efficaciously applied in the manufacturing sector to control processes and circumvent insufficiencies, leading not only to savings in monetary terms and time but also to high levels of consumer satisfaction Boaden, [14]. Few manufacturing processes are aimed at the production of single items whereas, in textiles manufacturing, the work is considered to be repetitive and generally, garment specifications are altered with each assignment Boaden, [14]. Nonetheless, not only are many garments essentially repeated products which can be repeatedly enriched but, more significantly, the processes of textile manufacturing are recurrent in their basics from task to task.

Consequently, notwithstanding the task size, the majority of inputs into garment manufacturing are repeated. Much maintenance work also applies a repeat process. Therefore, the focus is not on the production of the garment alone but on designing and planning the production as well. Therefore, improvement tools that are presently being applied must be adapted and used in the industry. Nevertheless, defects and errors that arise during the textile manufacturing phases offer opportunities for learning and improvement. One of the key intents of TQM is to increase consumer satisfaction. It

necessitates a commitment to ruminate the consumer perspective in all processes Eskildson [16]. Several concepts have been effectively applied in the manufacturing sector to realise continual improvement and ultimately product quality. One such concept is the Juran Trilogy which integrates three (3) characteristics; quality planning, quality control and quality improvement. Juran [21], infer that quality planning is the act of satiating consumers by developing products and processes that meet their requirements. To do so, a sequence of stages is charted. They include setting up quality objectives, identifying consumer requirements, developing products that meet their demands, instituting process controls and assessing quality performance. The Juran Trilogy necessitates management to comprehend the ensuing three (3) crucial methodologies: Juran [21].

1) The Planning Methodology

This approach advances and puts in place the planned and strategic goals that must be realised to achieve financial, operational, as well as quality outcomes. Setting organisational goals is termed strategic planning. Next, there is the preparation of innovative goods or services, which must consider the needs of the consumer to attain customer satisfaction. This is referred to as quality planning which symbolises the product and process design process. The umbrella word "planning" is applied to denote the activities conducted in preparation to do something. Quality Planning institutes, among other things, precise standards and/or specifications for explicit products and processes. Financial planning sets out the financial aims and the means to realise them.

2) The Control Methodology

The next management approach is employed to avert or correct undesirable or unanticipated change. This process is termed control. More specifically, control entails measuring actual performance, equating it to the target or standard, and taking the required action to correct the difference. Control preserves the standards and/or requirements outlined during the planning phase. Its goal is constancy and stability.

3) The Improvement Methodology

The Improvement Methodology - The third approach constructs a breakthrough system to generate planned, anticipated, and managed modification. This procedure is termed breakthrough. Breakthrough is an intended change, a dynamic and influential movement to exceptional levels of organisational performance that are currently active in the strategy and upheld by existing controls. Breakthrough results in attaining higher targets, meeting competitive standards as well as specifications, decreasing waste, dipping costs, and affording superior products and services to consumers.

Considerable modifications in the culture and structure of the textile manufacturing industry are required to allow the advancements in the project process that will provide high-quality products Quartey [1]. These include changes in working conditions, skills and training, approaches to design and production and application of technology, Dean and Bowen, [22]. Furthermore, if textile manufacturing firms are

to share in the benefits of value-added performance, the goals and targets that it sets must be directly related to customer's perceptions of performance. This symbolises measures of improvement regarding predictability, cost, time as well and quality. [Consumers will then be able to recognise the enhanced value and reward businesses that deliver them performance Dahlgaard and Dahlgaard [19]. According to Liker [12] targets must also be set for enhancing the quality and efficiency of manufacturing processes in terms of safety and labour productivity. Thus corners are not cut and textile manufacturing businesses as well as their workforce share in the benefits of success to deliver continuous improvement. Nonetheless, in the current global competitive marketplace, the requirements, as well as expectations of consumers, are increasing as they desire enhanced quality products due to high competition which affords consumers more control over their choice Flynn and Sakakibara, [23]. Moreover, due to globalisation and increasing competition globally, companies are expected to keep up with their competitors and increase their market share. Hence, quality is perceived as a suitable technique to increase business competitiveness, sustainability, and performance as it emphasises the whole organisation and produces a relationship between all participants and consumers in understanding their wants and desires Ellis, [7]. The effective implementation of TQM in the manufacturing sector in some countries such as Europe, the USA and Japan has led other corporations to implement TQM to advance their performance and consumer satisfaction David, [18]. Consequently, numerous enterprises have embraced quality management tools and techniques without even comprehending the inevitability or benefits of quality management. These companies believe that devising quality management within an organisation may improve the business's status and position in the marketplace. Nonetheless, the textiles manufacturing industry equated to other sectors is viewed as one with a poor quality emphasis, Eriksson and Garvare, [24]. TQM is more and more being embraced within the textiles industry as an initiative for resolving quality concerns within the industry and to meet the incessant desires of consumers Eriksson and Garvare, [24]. Boaden, [14] infer that TQM has the potential to advance business outcomes, worker involvement and accomplishment, greater consumer orientation and satisfaction, team and improved management of workforces within the organisation, however, notwithstanding the innumerable benefits of TQM adoption, businesses have been recurrently struggling with its implementation, as it necessitates long time and cultural transformation Evans and Lindsay [10]. In keeping with the previous descriptions of TQM, it can be determined that TQM is initially perceived as a technique for reducing defects and, thus, to decrease costs and increase profit margins, while at the same time offering consumers high-quality products within the lowest budget Liker [12]. Manufacturing organisations manufacture tangible products that can be seen, touched, and directly measured, whereas, service organisations, produce products that are intangible and cannot be seen or touched but experienced. Quality, thus, is more related to management,

personnel and operational processes instead of the final products, though from consumers' opinion, quality is directly linked with the final product, since quality perceived by consumers is the difference between the pre-purchase anticipation and after acquisition performance Dahlgaard and Dahlgaard [19].

1.4. The Evolution TQM

The concept of quality has been in existence for decades, though its connotation has altered and changed over time. In the early 20th century, quality management symbolized inspecting products to guarantee they met specifications. Table 1 gives a summary of the timeline and history of TQM.

Table 1. The timeline and history of TQM.

	Some of the initial seeds of quality management were planted as the ideologies of scientific management swept through most industries in the USA.
1920s	Companies detached the processes of planning and implementing the plan, and union antagonism rose as employees were deprived of a voice in the conditions as well as functions of their work.
1930s	The Hawthorne experiments in the twilight of the 1920s demonstrated how employee productivity could be influenced through engagement Shewhart established the approaches for statistical analysis as well as control of quality. Deming taught the approaches for statistical analysis as well as control of quality to Japanese engineers and directors. This was believed to be the foundation of TQM.
1950s	Juran taught the theories of controlling quality and management breakthroughs. Feigenbaum's book TQM, a precursor to the present comprehension of TQM, was published. Crosby's campaign of zero defects paved the way for quality improvement in most firms.
1968	The Japanese titled their approach to TQ companywide quality control. Which paved the way for the term quality management systems.. Ishikawa's synthesis of the philosophy contributed to Japan's dominance as a quality leader.
At present	TQM is the term used for the philosophy of a comprehensive and systemic approach to handling organizational quality. Quality standards such as the ISO 9000 series and quality award programs including the Deming Prize and the Malcolm Baldrige National Quality Award stipulate the ideologies and processes that encompass TQM.

Source: Adapted from Dale et al. (2013)

In the 1940s, during the period of World War II, quality became more statistical as indicated in Table 1. Statistical sampling techniques were employed to appraise quality, and quality control charts were applied to monitor most production processes. In the 1960s, with the help of the professed "quality gurus," the concept took on a comprehensive connotation. Quality then began to be regarded as something that involved the whole organization, not only the production processes. As all functions were seen to be responsible for product quality and all shared the costs of poor quality, quality was seen as a concept that affected the entire organization Mauch, [9] the connotation of quality for companies altered dramatically in the late 1970s. prior to that quality was still regarded as something that required to be inspected then corrected. Nonetheless, in the 1970s and 1980s, several U. S. industries lost their market shares to external competition. In the automobile industry, companies like Toyota and Honda became major players. In the consumer products market, corporations such as Toshiba and Sony were on top. These external competitors were manufacturing lower-priced products with relatively higher quality, Hackman and Wageman [11].

To survive, businesses had to make key shifts in their quality programs. Several firms engaged consultants and established quality training plans for their staff. An innovative concept of quality was then emerging. One consequence was that quality began to have a tactical connotation. Currently, successful businesses appreciate that quality affords a competitive advantage, Evans and Lindsay [10]. These firms place the customer first and express quality as meeting or exceeding consumer expectations. Ever since the 1970s, competition created on quality has developed in prominence and created incredible attention, concern, as well as passion.

Firms in every line of business are concentrating on refining quality to be and remain competitive. In many industries, quality excellence has become a standard for doing business. Companies that do not meet this standard simply will not survive, Ellis, [7]. Thus, the significance of quality is confirmed by national quality awards and quality accreditations that are sought-after by businesses. The old concept of quality was reactive i, e. designed to correct quality issues after they happen. However, the new concept is proactive, and designed to integrate quality into the product and process design.

1.5. Benefits of TQM Implementation

Implementing a quality management system such as TQM impacts all facets of an organization's performance. Benefits of TQM according to Shewhart [25] include meeting customer needs, which aids in instilling confidence in the firm, this in turn leads to additional patrons, extra sales, and additional business. It also meets the firm's need, which guarantees compliance with guidelines and the provision of goods and services in the most cost-effective and resource-efficient fashion, making room for growth, and profits. These benefits offer added benefits, like helping to communicate a willingness to produce reliable results, averting errors, and dipping costs, guaranteeing that processes are well-defined and well-ordered, and incessantly improving the firm's offerings.

Again, TQM agendas, if efficiently implemented, can lead to considerable benefits. These benefits do not occur overnight and will only be appreciated in the long term. Institutions that implement TQM excellently have to be enduring and will witness improvement in their performance

over time Shewhart [25]. Juran [21] asserted that the projected benefits of TQM implementation include but are not limited to lower costs, greater revenues, fulfilled consumers as well and enabled personnel.

Liker [12] discovered that customer satisfaction and adeptness were the most valued benefits of introducing TQM in firms. TQM aids firms by equipping them to profit from superior customer gratification and enhanced quality through the introduction of quality improvements. Evans and Lindsay [10] discovered that the key benefits of TQM implementation include sustaining a competitive advantage, enhancing customer satisfaction, increasing sentence of quality and improving operational processes. According to Dahlgaard and Dahlgaard [19] when TQM is positively implemented, the organization will reap the benefits of continuous improvements in their products, processes as well and services, a decrease in costs, improved productivity and improved overall customer fulfilment. TQM thus affords numerous benefits when correctly implemented, including reduced scrap and rework, the eradication of defects, reduced levels of cost, improved levels of output, efficiency and enhanced staff morale. There is proof that correct TQM implementation advances firm performance and adds valued benefits including fewer faults, less rework and scrap, reduced lead times, greater flexibility and enhanced customer satisfaction. TQM execution can result in enhanced products and services, more fulfilled personnel and consumers, reduced costs and an improvement in the firm's monetary performance Flynn and Sakakibara, [23]. ASQ Quality Management enumerates the following benefits of TQM; reinforced competitive position; adaptability to shifting or emerging market settings and to environmental and other government guidelines; higher output and profitability; superior market image; and eradication of flaws and waste. The others include reduced and better cost management; enhanced client focus and fulfilment; improved client loyalty and retention; better job security; improved employee morale; enhanced shareholder and stakeholder value and improved and innovative processes.

1.6. Challenges to TQM Implementation

Confronted with a catalogue of developments, some TQM experts are convinced of the TQM philosophy as a managerial solution, while others remain skeptical, Dahlgaard and Dahlgaard [19]. Empirical studies divulge a substantial degree of invigorated consideration in initiating TQM for a wide range of corporations, Hackman and Wageman [11]. At the bottom, there are two domains of discourse. The first is theoretical, with the other empirical. Relative to the first, outstanding as it may appear, and notwithstanding several major reviews that labelled TQM programmes as failures, there is a noticeable sufficiency of logical confirmation that pushes aside any intrinsic error in the TQM concept and its philosophy, Mauch [9]. Specifically, this concern has also been addressed by David [18], regarding the several factors supporting and obstructing organizational learning. The next area for debate, is the practical facets, even though the common opinion is that the majority of TQM initiatives were

successful in practice, this view is supported by the opinions of the numerous experts who advise firms on the subject. However, a review of the literature infers the ensuing components are the barriers and challenges to TQM implementation efforts, Boaden [14].

1. Absence of senior management commitment and their evident involvement.
2. Overlapping of responsibilities of management
3. Inadequate resources
4. Work overloads
5. Lack of complete quality improvement training.
6. Lack of customer orientation.
7. Lack of transparency in measurement systems.
8. Lack of a commonly acknowledged and accurate definition of TQM features.
9. Satisfaction with customer gratification, which may obstruct exceeding customer satisfaction.
10. Established quality management.
11. Nonexistence of real people participation.

1.7. The Indigenous Ghanaian Smock

The smock or fugu is a product that is exclusive to Ghana, being fully hand woven and has its origins in the Northern regions. The smock is produced in many towns in the Northern part of Ghana, but most of its trading activities are concentrated in Tamale, Bolgatanga and Wa; the regional capitals of Northern, Upper East and Upper West Regions respectively. There are also established smock activities in smaller towns like Yendi, Daboya and many others spread across the three Northern regions. The smock industry according to Tettehfiio [2] has a historical origin and provides the traditional clothing of the people of the North. The smock historically served as the traditional wear of people in northern Ghana but has now gotten attention in the entire country and the globe. Smocks traditionally were worn by Chiefs and kingmakers of Northern Ghana. They were also worn during special occasions like festivals and casually in a few areas. In these modern times, smock has become designer clothes worn by Ordinary men, women and children in Ghana and beyond Tettehfiio [2]. Fugu or smock is a variety of loose garments sewn from strips of cloth woven on traditional looms in Northern Ghana. The Smocks of Northern Ghana are made of fabrics of pure cotton. Textiles of every country and tradition on earth have their decorative Textiles which make them unique. The smock mostly has a white background captivating colour stripes of different kinds and is not as complicated as the "Kente" Tettehfiio [2] found in Southern Ghana. Colours generally seen in the "fugu" fabric are formed by the warping design of the cloth with white being predominant. This is attributed to indigenous knowledge of the relevance of colours as white colour reflects the sun's rays to limit the heat generated. The use of white was, therefore, a measure to give comfort to users in the warm savannah climate in Ghana. Tettehfiio [2] specified that colours mostly used or mixed with white include blue, black and white with an occasional choice of green, red, violet, yellow and brown. Modern-day demands are however expanding the colour choices of smocks to

include almost all possible preferences of users.

Similar to what prevails in many other traditional textiles, smocks also have names that differentiate one weave from another. The names are assigned to different colour combinations. The most popular design is the guinea fowl pattern which is made of a pattern of white and light black or ash mixup. Tettehfiio asserts that apart from the guinea fowl pattern popularly known as "kpankobri", other patterns include: "tupalzie", "kutorfa", "bon-zie", "VIP", "bonsabinli", "cedi", "tupal-sabinli", "sanda". The commonly known ones also include "alkila", "abin makorla", "obarko", "minister", "Angelina" and many more. There are many other designs and patterns which this study cannot exhaust. These names are mostly based on the colour combinations, event for production, objects, names of persons and nature of usage. Individual weavers also assign names of their choices to designed patterns based on their own discretion, Aguilera *et al.* [28].

Smock garments are also made in different styles and lengths with each having its distinct name. Some of the distinct types include; "banaga" (short smock with sleeves), "dansiki" (short smock without sleeves) and "kutunbi" (long outer smock with long sleeves). Combinations of these fugu types with a similar hat are also made and generally referred to as "kutunbi suit" (long outer smock (kutunbi) with long sleeves, short sleeveless inner smock (dansiki), trousers and hat. In some instances, smock goes with some corresponding trousers referred to as "kpakoto", Egu [27].

1.8. Concepts of Sustainability

Sustainability is a necessity and a primary issue of the twenty-first century and is often paired with Corporate Social Responsibility (CSR) Bansal and Roth [29], an emerging green orientation at some companies and informed purchasing decisions Fletcher [30]. There are many definitions of sustainability. The three commonly used are based on an activity that can be continued indefinitely as well as doing unto others as one expects others to do unto them. And meeting a current generation's needs without jeopardizing the future of unborn generations Seidman [31]. According to Beard [32] 'sustainability is much more than our relationship with the environment; it's about our relationship with ourselves, our institutions and society as a whole.

Sustainability involves complex and changing environmental dynamics that affect human livelihoods and well-being, with intersecting ecological, economic, and socio-political dimensions, both globally and locally. Organisations are embedded in society and reflect the value they offer the community, which raises profound issues. As Diamond [33] notes, 'the difficulty associated with the fashion industry is to recognise how all the component suppliers can be secured ethically and accounted for, together with the labour used to manufacture the garment. Its transport from factory to retail outlet, and ultimately the garment's aftercare and disposal.

Sustainability is defined as the study of how natural systems function, remain diverse and produce everything they need for the ecology to continue in its scheduled balance. It also

acknowledges that human civilisation takes resources to sustain man's modern way of life Diamond [33]. There are many examples across the history of humanity where civilisation has damaged its environment and severely affected the very survival of its own (some of which have been explored in Jared Diamond's book *Collapse: How Complex Societies Choose to Fail or Survive* Lorek [34]. Sustainability takes into account how humans live in harmony with the natural world, protecting it from damage and destruction. According to Bansal and Roth [29], humans now live in a modern, consumerist and mostly urban existence and consume a lot of natural resources each day. In urban centres, people consume more power than those who live in rural settings and urban centres use more energy than average, keeping the streets, and civic buildings lit, power appliances, heating and other public and household power requirements. This does not mean sustainable living only focuses on people who live in urban centres. It is estimated that people use about 40% more resources every year than they can put back Epa [35]. Sustainability and sustainable development focus on balancing that fine line between competing needs, i.e. the need to move forward economically and technologically, and the need to protect the environments in which humans live. As Epa, [36] points out, sustainability is not just about the environment; it is also about our health as a community in ensuring that no one suffers because of environmental legislation. The present study sought to investigate the extent of TQM implementation in the design and production of indigenous textiles (smocks) in Northern Ghana; and determine the ways and the extent to which TQM can be implemented relative to the design and production of indigenous textiles in Northern Ghana for Sustainable development.

2. Methods

2.1. Methodology

The research approach was both descriptive and exploratory. The study was conducted using the mixed methods approach as the strategy for data collection. The data collection instruments included self-administered questionnaires as well as interview protocols. The quantitative approach was used to gather data from a vast number of sources about the respondents' knowledge and practices regarding TQM implementation, systems and practices in their firms. The qualitative methodology was employed to obtain data that captured the different dimensions of respondents' experiences, personal perspectives and meanings, values, norms, and beliefs regarding TQM implementation.

2.2. Population/Sample Technique

In the current study, convenience sampling was employed to select the participants from Northern Ghana who design and produce indigenous textiles (smocks). Qureshi [36] asserts that convenience sampling also referred to as haphazard sampling, non-probability or

non-random sampling where participants of the target population satisfy practical criteria, like easy accessibility, geographic proximity, availability at a specific time, or the readiness to participate are included in a study. Consequently, the convenience sampling technique was used to select the sample for the study. Zhi [37] asserts that convenience sampling is appropriate when the study aims to glean knowledge from targeted respondents deemed to have specific knowledge in the field of study based on the judgement of the researcher. Thus, a total sample size of 120 individuals in the smock production value chain was selected conveniently from Northern Ghana who design and produce indigenous textiles (smocks). This was made up of 80 individuals involved in the actual production of smock whereas the remaining 40 were smock consumers.

2.3. Instruments for Data Collection

The instruments used for this data collection were formal interviews and questionnaires. The interview guide and questionnaire were developed based on the following objectives:

1. To investigate the extent of TQM implementation in the design and production of indigenous textiles (smocks) in Northern Ghana.
2. To determine the ways and the extent to which TQM can be implemented relative to the design and production of indigenous textiles in Northern Ghana for Sustainable Development.
3. To identify the fundamental pillars required for the implementation of TQM principles in the design and production of indigenous textiles (smocks) in Ghana for sustainable development.

3. Result and Discussion

A good number of research papers have been written on smocks and their mode of production in Ghana, typical amongst them are those written by Dzamedo et al. and Abdul-Rahim et al. on topics such as; challenges and sustainability of smock weaving within the West Gongga District of the Northern region and The Smock: Exploring an indigenous industry in Tamale Metropolis of Northern Ghana respectively. Although these authors ascertain smock weaving in Northern Ghana as a potential economic activity, they have not linked them to the best business practices in the design and production processes to ensure sustainability. It was observed that producers of smocks in Northern Ghana have no idea of the implementation of TQM in the design and production of indigenous textiles (smocks) for sustainable development. the best practice which aims at increasing performance in the design and production of smocks by ensuring effectiveness in business with reduction of waste and maximizing profit, which the study is targeted at. TQM implementation is all about cost and waste reduction, resource planning and utilization, and so on. The main thrust of TQM is focusing on customer satisfaction and remaining operationally efficient. The results of the study have been tabulated and discussed descriptively.

Table 2. Age of respondents.

Responses	Frequency	Percentage
< 20 yrs.	55	32.2
21 - 30 years	38	22.2
31 - 40 years	60	35.1
41 - 50 years	18	10.5
Total	171	100.0

Table 2. shows the age distribution of respondents. Out of 171 respondents 60 representing 35.1% were within the 31-40 age range, 55 representing 32.2% were below 20 years, 38 representing 22.2% were between 21-30 years with 18 representing 10.5% being between 41-50 years. It can be noted that majority of the respondents were above 20 years.

From the responses it can be concluded that the sample was dominated by persons between the ages of 20 to 40 years. This implies that the sample was a youthful one to deal with.

Table 3. Educational qualification.

Responses	Frequency	Percentage
Basic Education	38	22.2
Bachelor's degree	70	40.9
Masters' degree	61	35.7
Other (specify)	2	1.2
Total	171	100.0

Table 3 depicts the educational qualification of respondents used for the study. From the table, 70 respondents representing 40.9% were Bachelor's Degree Holders, 61 representing 35.7% were Master's Degree holders, 38 representing 22.2% had Basic Education with only two respondents representing 1.2% possessing other qualifications. This indicates that most of the respondents were Graduates or Post Graduate Degree Holders and that they have sufficient education to make worthy contributions to the study.

Table 4. Number of workers.

Responses	Frequency	Percentage
5 - 20	16	9.4
20 - 50	15	8.8
50 - 100	13	7.6
100+	56	32.7
Not sure	71	41.5
Total	171	100.0

Source: Fieldwork (2020)

This section of the study captures the Business profile of respondents used for the study. From Table 4. 71 respondents representing 41.5% were not sure of the number of workers in their companies, 56 representing 32.7% had over 100 workers, 16 representing 9.4% had 5-20 workers, 15 representing 8.8% had 50-100 workers with 13 representing 7.6% having 5—100 workers.

This implies that the majority of the respondents were not sure of the number of workers in their companies.

Table 5. Business have a full manufacturing process.

Responses	Frequency	Percentage
Full process	97	56.7
Sub-contractor	57	33.3

Responses	Frequency	Percentage
Not sure	17	9.9
Total	171	100.0

Source: Fieldwork (2020)

Table 5. Of 97 respondents 56.7% said their business has a full process manufacturing process, 57 representing 33.3% asserted sub-contractor with 17 representing 9.9% being not sure of the manufacturing process used by their business. This suggests that the majority of the businesses had full manufacturing processes.

Table 6. Years in operation.

Responses	Frequency	Percentage
0 - 10 years	32	18.7
11 - 25 years	39	22.8
> 25 years	86	50.3
Not sure	14	8.2
Total	171	100.0

Source: Fieldwork (2020)

Table 6 shows the number of years businesses have been in operation. From the table 86 respondents representing 50.3% asserted their businesses had been in operation for more than 25 years, 39 representing 22.8% asserted 11-25 years, 32 representing 18.7% asserted 10 years or less with 14 representing 8.2% not being sure. It can be noted that most of the businesses had been in operation for more than 10 years and hence have acquired sufficient experience to contribute meaningfully to the study.

Table 7. Quality system in place in the business.

Responses	Frequency	Percentage
None	41	24.6
Six Sigma	60	35.9
TQM	66	39.5
Total	167	100.0

Source: Fieldwork (2020)

Table 7 shows respondents' views on the quality system their businesses have. From the table, 66 respondents representing 39.5% asserted their businesses have TQM, 60 representing 35.9% asserted Six Sigma 41 representing 24.6% indicated none. From the responses, it can be concluded that most of the businesses surveyed have instituted the TQM system. However, it is worth noting that a significant number of the businesses surveyed are into the implementation of the Six Sigma system.

Table 8. The reasons for implementing TQM.

Responses	Frequency	Percentage
Customers' requirement	69	40.4
Marketing purpose	52	30.4
Others	50	29.2
Total	171	100.0

Source: Fieldwork (2019)

Table 8 shows respondents' views on the reasons for

implementing a quality system. From the table, 69 respondents representing 40.4% asserted customers' requirements, and 52 representing 30.4% indicated marketing purpose as the reason for the adoption of Total Quality Management in their operations. However, it is worth noting that a total of 50 respondents 29.2% indicated other reasons for the implementation of the system.

It can therefore be concluded that most businesses adopted quality management systems because of customer requirements as well as marketing purposes for other businesses. So a significant number of businesses also cited other reasons.

Table 9. Difficulty level of the implementation process.

Responses	Frequency	Percentage
Others	5	3.0
Easy	21	12.4
Challenging	51	30.2
Difficult	66	39.1
Extremely difficult	26	15.4
Total	169	100.0

Source: Fieldwork (2020)

From Table 9, 66 respondents representing 39.1% indicated that the implementation process for the quality systems was difficult, 51 representing 30.2% said it was challenging, 26 representing 15.4% said it was extremely difficult, 21 representing 12.4% said easy with only five representing 3% indicating others.

This shows that the implementation of various quality systems was difficult in various businesses.

Table 10. Business encourage staff development.

Responses	Frequency	Percentage
Yes	153	89.5
No	18	10.5
Total	171	100.0

Source: Fieldwork (2020)

Table 10 shows respondents' views on whether their businesses encourage staff development. Out of 171 respondents, 153 representing more than two-thirds 89.5% of the respondents said Yes to the fact that their businesses encourage staff development with 18 representing 10.5% asserting No. This implies that the businesses surveyed ensure that their staff obtain some form of development to enhance their competencies.

Table 11. How often does business send employees to training.

Responses	Frequency	Percentage
Regularly	95	55.6
When there is a need	76	44.4
Total	171	100.0

Source: Fieldwork (2020)

As indicated in table 11, out of 171 respondents, 95 representing 55.6% indicated that their businesses send employees to training regularly while 76 representing 44.4%

indicated that their businesses send employees to training when there is a need. This implies that the businesses that

were surveyed regularly send their employees to training.

Table 12. Descriptive statistics on the challenges of the Implementation and Practice and TQM.

Statements	N	Min	Max	M	±SD
Employees resistant to change	167	1	5	3.68	1.065
Poor planning	167	1	5	3.66	.973
Lack of management commitment	167	1	33	3.44	2.509
Lack of proper training	170	1	5	3.35	1.034
Lack of quality planning	170	1	5	3.38	1.027
Absence of leadership in the development of a quality culture	169	1	5	3.52	.995
Insufficient resources for TQM implementation	168	1	5	3.53	1.049
Lack of customer orientation.	166	1	5	3.41	.935
The inability to change the business philosophy (culture)	165	1	5	3.52	.894
Ineffective or unsuitable methods in the implementation of TQM	166	1	5	3.34	.872
Absence of motivation and reward systems	166	1	5	3.39	.920
Lack of use of quality measurement and benchmarking	166	1	5	3.36	.901
Poor managerial communication.	167	1	5	3.44	.967

Source: Fieldwork (2020)

Table 12 shows the descriptive statistics on respondents' responses on the challenges of the implementation and practice of TQM in the Design and Production of Indigenous Textiles. This was measured on the five-point likert scale of 1-strongly disagree, 2- disagree, 3-not sure, 4- agree and 5-strongly agree.

Moreover, most of the respondents agreed that absence of leadership in the development of quality culture ($M=3.52$, $\pm SD=.995$), insufficient resources for TQM implementation ($M=3.53$, $\pm SD=1.049$), lack of customer orientation ($M=3.41$, $\pm SD=.935$), inability to change business philosophy ($M=3.52$, $\pm SD=.894$), ineffective or unsuitable methods in the implementation of TQM ($M=3.34$, $\pm SD=.872$), and absence of motivation and reward systems ($M=3.39$, $\pm SD=.920$) also posed challenges to the implementation and practice of TQM in the design and production of indigenous textiles.

From the table majority of the respondents agreed that

employees resistance to change ($M=3.68$, $\pm SD=1.065$), poor planning ($M=3.66$, $\pm SD=.973$), lack of management commitment ($M=3.44$, $\pm SD=2.509$), lack of proper training ($M=3.35$, $\pm SD=1.034$) and lack of quality planning ($M=3.38$, $\pm SD=1.027$) impedes the successfully implementation and practice of TQM.

Finally, majority of the respondents also agreed lack of use of quality measurement and benchmarking ($M=3.36$, $\pm SD=.967$) and poor managerial communication ($M=3.44$, $\pm SD=.967$) pose threat to the successful implementation and practice of TQM.

The discussions suggest that the challenges to the implementation and practice of TQM could be attributed to most employees resisting change, problems of planning, training, ineffective methods, poor managerial communication, lack of customer orientation etc.

Table 13. Descriptive statistics on the Prospects/Benefits of TQM implementation.

Statements	N	Min	Max	M	±SD
Gradually improving the operations of the business	170	1	5	3.64	.868
Strengthened competitive position	169	1	5	3.49	1.070
Adaptability to changing or emerging market conditions and to environmental and other government regulations	171	1	5	3.48	1.019
Higher productivity	171	1	5	3.77	.861
Enhanced market image	171	1	5	3.42	1.022
Elimination of defects and waste	171	1	5	3.45	.959
Reduced costs and better cost management	169	1	5	3.50	.958
Higher profitability	171	1	5	3.70	.915
Improved customer focus and satisfaction	170	1	5	3.48	.950
Increased customer loyalty and retention	170	1	5	3.69	1.115
Increased job security	171	1	5	3.45	.959
Improved employee morale	171	1	5	3.49	.966
Improved and innovative processes	171	1	5	2.74	1.386

Source: Fieldwork (2020)

Table 13 shows respondents' views on the prospects/benefits of TQM implementation in the Design and Production of Indigenous Textiles. This was measured on the five-point Likert scale of 1-strongly disagree, 2- disagree, 3-not sure, 4- agree and 5-strongly agree.

From the table majority of the respondents agreed that TQM implementation gradually improves the operations of the business ($M=3.64$, $\pm SD=.868$), strengthen competitive position ($M=3.49$, $\pm SD=1.070$), helps companies adapt to change ($M=3.48$, $\pm SD=1.019$), ensures higher productivity

($M=3.77$, $\pm SD=.861$) and enhances market image ($M=3.42$, $\pm SD=1.022$).

That notwithstanding, most of the respondents agreed to the following prospects of TQM implementation; elimination of defects and waste ($M=3.45$, $\pm SD=.959$), reduced costs and better cost management ($M=3.50$, $\pm SD=.958$), higher profitability ($M=3.70$, $\pm SD=.915$), improved customer focus and satisfaction ($M=3.48$, $\pm SD=.950$) and increased customer loyalty and retention ($M=3.69$, $\pm SD=1.115$).

Finally, most of the respondents agreed that the implementation of TQM increases job security ($M=3.45$,

$\pm SD=.959$), and improves employee morale ($M=3.49$, $\pm SD=.966$). However, majority were not sure of whether TQM implementation ensures improved and innovative processes ($M=2.74$, $\pm SD=1.386$).

It can be noted that the implementation of TQM brings several benefits for businesses. These benefits can be realised on business operations, customer satisfaction and retention and adaptability to changing or emerging market conditions. Such changes were noted as improving business operations, elimination of defects and waste, higher profitability, increased job security among others.

Table 14. Descriptive Statistics on Practical Implications for Improved Practices of TQM.

Statements	N	Min	Max	M	$\pm SD$
The business profits will improve	171	1	5	3.60	.878
Problems in the technical processes will decrease	171	1	5	3.47	.990
Defects/errors in the finished products will decrease	171	1	5	3.74	1.082
Customer satisfaction will show improvement	170	1	5	3.66	.884
Employee morale will be high	171	1	5	4.26	.883
There will be a culture of excellence in the business	171	1	5	3.94	.875
Market share will increase	171	1	5	4.22	.866
The customer base will increase	171	1	5	3.94	.893
Asset base will increase	171	1	6	4.13	.819
Communication within the company will improve	171	1	5	4.44	.704
The number of products defects, errors, or failures found by the customer will decrease.	171	1	5	4.20	.804

Source: Fieldwork (2020)

Table 14 shows the descriptive statistics of respondents' views on the practical implications for improved practices of TQM. This was measured on the five-point Likert scale of 1-strongly disagree, 2- disagree, 3-not sure, 4- agree and 5-strongly agree.

From the table most of the respondents agreed that business profits will improve ($M=3.60$, $\pm SD=.878$), problems in the technical process will decrease ($M=3.47$, $\pm SD=.990$), defects/errors in finished products will decrease ($M=3.74$, $\pm SD=1.082$), customer satisfaction will show improvement ($M=3.66$, $\pm SD=.884$), and employee morale will be high ($M=4.26$, $\pm SD=.883$).

Moreover, majority of the respondents also agreed that there will be a culture of excellence in the business ($M=3.94$, $\pm SD=.875$), market share will increase ($M=4.22$, $\pm SD=.866$), the customers will increase ($M=3.94$, $\pm SD=.893$), and the asset base of the business will increase ($M=4.13$, $\pm SD=.819$).

Finally, most of the respondents agreed that communication within the company will improve ($M=4.44$, $\pm SD=.704$) and the number of products defects, errors, or failures found by the customer will decrease ($M=4.20$, $\pm SD=.804$).

It can be noted from the above discussions that the Practical Implications for Improved Practices of TQM is enormous when considering business operations. Most improved TQM practices predominantly improve businesses, resolves technical problems, rectifies defects/errors, increases employee morale, improves communications and ensures a culture of excellence in businesses.

4. Conclusion of Questionnaires

From the analysis of the questionnaire responses, it could be

concluded that most of the businesses that are into the design and production of indigenous textiles (smocks) had full manufacturing processes. Additionally, it was concluded that most of the businesses had been in operation for more than 10 years and that most of the businesses had adopted the TQM system. However, it was also found that a significant number of the businesses surveyed are not into the implementation of the TQM system. Again, it can be concluded that most businesses did not adopt quality management systems because of customer requirements as well as marketing purposes for other businesses. Again, a significant number of businesses also cited other reasons. This shows that the implementation of various quality systems was difficult in various businesses. This implies that the businesses surveyed ensure that their staff obtain some form of development to enhance their competencies and by so doing they regularly send their staff to training. Furthermore, a small number of businesses that have implemented TQM in the design and production of indigenous textiles have a quality policy in place, showed commitment to quality, involved employees in decision-making and encouraged teamwork. Moreover, businesses communicated business objectives and measured quality performance and customer satisfaction with employees being satisfied working for their businesses.

The questionnaires also concluded that it was relevant for businesses to consider several factors when implementing TQM in the Design and Production of Indigenous Textiles. Such factors include clarifying vision, mission and values, involvement of management, identification of critical success factors, soliciting customer feedback, surveying customer groups, and monitoring and determining quality costs.

It can be noted from the responses that various fundamental pillars are required to effectively implement TQM principles in the Design and Production of Indigenous Textiles. Such pillars include the creation of a quality management environment, development of teamwork, focus on the customer, focus on supplier relationships, improvement of processes and the introduction of change through instruction, communication, recognition, performance, behaviour and teamwork.

Again, it was concluded that the challenges to the implementation and practice of TQM could be attributed to most employees resisting change, problems of planning, and training, ineffective methods, poor managerial communication,

lack of customer orientation etc. and that the implementation of TQM brings several benefits for businesses. These benefits can be realised on business operations, customer satisfaction and retention and adaptability to changing or emerging market conditions. Such changes were noted as improving business operations, elimination of defects and waste, higher profitability, and increased job security among others. Also, the practical implications for improved practices of TQM are enormous when considering business operations. Most improved TQM practices predominantly improve businesses, resolve technical problems, rectify defects/errors, increase employee morale, improve communications and ensure a culture of excellence in businesses.

5. Hypothesis

Table 15. Hypothesis Testing.

Hypothesis	Tests	df and Level of Sig.	Chi-Square (P-Values)	Decision
1. There is no significant association between the adoption of best practices in TQM implementation and operational performance of Design and Production of indigenous Textiles	Chi-square Tests	(5%)	17882.02 (.260)	Accept
2. There is no significant association between TQM practices and sustainable development	Chi-square Tests	4 (5%)	58973.86 (.001)	Reject

Source: Fieldwork (2020)

Hypothesis 1: There is no significant association between the adoption of best practices in TQM implementation and operational performance of Design and Production of indigenous Textiles (Smocks) in the Ghanaian context

Chi-square was conducted to test this hypothesis. The hypothesis asserts There is no significant association between the adoption of best practices in TQM implementation and operational performance of Design and Production of indigenous Textiles (Smocks) in the Ghanaian context.

The test results value of ($\chi^2=17882.02$, $p=.260$), suggests that the hypothesis is supported implying that there is no statistically significant association between the adoption of best practices in TQM implementation and operational performance of Design and Production of indigenous textiles.

Hypothesis 2: There is no significant association between TQM practices and sustainable development

Statistical analysis of the responses proved with a chi-square value of ($\chi^2=58973.86$, $p<.05$) which stated that there is no significant association between TQM practices and sustainable development. Reference from Table 15 shows that the null hypothesis was not supported which goes to show that there is indeed no statistically significant association TQM practices and sustainable development.

Hypothesis 3: The size and type of a textile firm have a significant effect on the implementation of TQM practices

This hypothesis sought to assess the effect of firm size and type on the implementation of TQM practices.

Table 16. Pearson's correlation analysis of Hypothesis.

		Firm size	Firm Type	TQM implementation
Firm size	Pearson Correlation	1	.505**	.641
	Sig. (2-tailed)		.000	.017
	N		171	171
Firm Type	Pearson Correlation		1	.874
	Sig. (2-tailed)			.090
	N			171

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

From Table 16, the results sought to assess the effects of firm size and firm type on the implementation of TQM. From the Pearson's correlation analysis, it could be observed that there was a moderate, positive correlation between firm size and the implementation of TQM in the businesses, which was statistically significant ($r=.641$, $n=171$, $p=.017$).

Additionally, the results show that there was a strong,

correlation between firm type and the implementation of TQM in businesses. However, this strong correlation was not statistically significant ($r=.874$, $n=171$, $p=.090$).

From the results it could be concluded that there is positive effect of firm size and firm type on the implementation of TQM among businesses into the design and production of indigenous Textiles (Smocks).

6. Conclusion of Mathematical Analysis

It can be concluded from the mathematical analysis that there is no statistically significant association between the adoption of best practices in TQM implementation and operational performance of the Design and Production of indigenous textiles and also, there is indeed no statistically significant association between TQM practices and sustainable development. Again, the size and type of firm and type have some level of effect on the implementation of TQM among businesses in the design and production of indigenous Textiles (Smocks).

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