

Analysis of Total Quality Management Practices in Schools-A case study of Lusaka Province in Zambia

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Abstract

Aim - This paper aims to explore total quality management (TQM) practices in secondary schools in Lusaka province in Zambia.

Design/Methodology/Approach - An exploratory research design was employed. Questionnaires and structured interviews were used to collect data. Purposive and simple random sampling was used to select 120 secondary school teachers from a total of 1740 secondary school teachers in Lusaka district. The research was anchored on the theoretical and conceptual framework and hypotheses were formed and tested.

Findings - Teamwork principle was found to be practiced though most respondents did not know the extent to which it was practiced. Continuous improvement was practiced through monthly tests and end of term examinations. For the training principle; this has been interwoven with the policy from the ministry in programs aimed at training in-service teachers and anticipated teachers. The commitment principle was practiced on the view of management working together for pupil-satisfaction. At 95% confidence level the mission statement, the motto and the vision of the school depicted quality related activities hence achieving the quality principle.

Originality/Value - The paper brings forward TQM principles often unrecognized in learning institutions in Zambia.

Key words Total Quality Management (TQM), Principles, Schools, Teamwork, Quality, Training, Continuous Improvement.

Paper Type Research Paper

1. Introduction

Total Quality Management (TQM) is a management approach that was established in the 1950's to seek sources of continuous motion of improvement to provide quality products and services to customers or clients (Pandi, 2009). This approach was later migrated to the service, banking and financial sectors in order to provide good quality services to customers.

The movement for total quality in education is of more recent origin as the surge of interest had started to occur in the nineteen ninety onwards. Since quality is a passion for excellence, education is also recognizing the need to pursue it and to deliver to pupils or students (Peters, 1999). Many of the ideas associated with TQM are now developed in higher education and it has started to become the mainstream in schools even though its users are not acquainted with the name but use its features. There are quite a number of areas in education which can be a source of quality. Amongst these can be excellent examination results, outstanding teachers, well balanced and challenging curriculum, and application of latest technology, strong and purposeful leadership and plentiful resources. It is for these reasons that the researchers set out to identify the TQM principles being practiced in secondary schools, the extent to which these principles are practiced and finally to determine the factors that affect the practice of these principles.

The principles of TQM can also be applied to different levels of high school, middle school, and elementary school educational processes as well as to training institutions. Indeed, the concepts formulated by TQM founder, W. Edwards Deming (1986), have proved so powerful that educators have applied TQM to schools (Lunenburg, 2010). Deming's 14 principles are based on the assumption that people want to do their best and that it is management's job to enable them to do so by constantly improving the system in which they work and therefore it was imperative that the research consider the extent to which these principles are practiced in secondary schools especially that, for schools the purpose of the system must be clear and shared by all stakeholders, school board members, administrators, teachers, support staff, parents, community and students.

Many studies have been conducted in developed countries to show the practice of TQM principles in secondary schools. According to a study conducted by Jamaa (2010), the effectiveness of applying TQM in public senior high school results in an effort to address the quality challenge and meets the global quality education standard. As a result of this study, the Indonesia national educational policy (No. 20, 2003) recommended the establishment of model schools in the existing primary and secondary schools which are based on international education standards. In a similar research in Malaysia, Pourrajab et. al (2011) conducted a literature review and showed that educators in Malaysia believed that applying TQM in education can enhance the performance of schools especially in improving the quality of teaching and learning in schools. Rampa (2004) argued on, how TQM can be identified and conceptualized in an education system using Deming's fourteen points. He concluded that, words such as learning and curriculum are not found in the fourteen principles. Consequently some of Deming's terminology needs to translate to schools and this can be achieved when principles of TQM are considered as management, teachers as employers, students as employees and customers, and acquiring knowledge as a product. Lunenburg (2010) and Ornstein (2008) have therefore claimed that, with these translations made, many applications to schools can be achieved. In Alaska, Cotton (1987) conducted a study on applying TQM principles to secondary education at Mt. Edgecumbe High school. He found out that, teachers attend conferences in order to improve the quality of education. These findings hinged on the TQM principle which states that management should provide training to the employees if

quality is to be achieved. Cotton (1987) further reported that seldom had that kind of event had such far-reaching impact on the school as the participation of Mt. Edgecumbe's technology/business teacher at a TQM conference. The teacher learned about the fourteen points" for quality in business operations and became familiar with the "three Cs"—which focus on customers, culture, and capacity for continuous improvement--which are the signature features of total quality environments and which many successful businesses have used to rejuvenate themselves.

Studies on the application of TQM principles in developed nation's schools have led to research on the application of the same principles in developing nation's schools. In Kenya, Ngware et al., (2006) conducted a study to establish the practices of TQM in some secondary schools. The findings revealed that the board of governors and chairpersons in secondary schools were not providing the necessary leadership that would promote TQM practices necessary for the schools' continuous improvement. However, some head teachers were providing the required leadership with a considerable number of school management empowering their employees. The majority of schools were not committed to strategic quality planning, though they did promote human resource development initiatives. In South Africa, Thokozile and Magwaza (2007) conducted a study on Educators' views on total quality management in secondary schools. The study aimed at finding out how TQM principles could be used to achieve quality teaching and learning. The results of the study indicated that, educators with a positive view of TQM principles were more likely to apply them in their teaching situations, knowing that the student is the most important customer who needs to gain satisfactory knowledge from the learning process. Also, TQM principles were practiced at different levels in secondary schools except that some educators did not even know that they were practising TQM as they delivered to the public. In Zambia, no study has been conducted on the application of TQM principles in secondary schools.

In all these studies, a number of TQM principles are practiced in secondary schools and according to Pourrajab et al (2011) continuous improvement approach requires teachers to strive for zero defects and efficiency in all processes. Pourrajab et al (2011) further mentioned customer focus as another principle in which external and internal customers are the focus of TQM systems and in this research the external customers are pupils or individuals who place orders for products from the school while internal customers in a school are co-workers or departments that accept work as it moves through the school. For a school that uses TQM, each teacher must identify his customers and determine the best way to satisfy their quality needs. Teachers must therefore identify their suppliers and communicate their quality needs to the supplier. Team involvement principle is indeed essential in the implementation of TQM in schools and therefore creating an atmosphere of teamwork and empowering workers to take the initiative to improve the processes and quality. TQM uses measurable tools such as statistical process, process mapping and bar graphs in order to make decisions for the company's improvement efforts and in the case of a school setup, schools can use these tools to track and find areas that need improvement.

According to Garvin, (1987), quality is a composition of eight different stages which include performance, suitability, reliability, endurance, utility, aesthetic, credit, and so forth. For this

research, quality is an element in TQM and therefore for a school setup, the quality approach came in as most schools contacted during the research did not show a positive mentality on quality. The efficient quality control can be provided by statistical quality control process in the frame of quality control system. The system of quality control includes administrative interventions that would be made at the stages of input, process, and output in order to produce products and services that reach the level of appreciated quality (Tekin, 1999) while according to Purkey (1978), there is a relation between administrators' education levels and their perception of quality, administrators' educational fields and their attitudes toward 'clients' and administrators' educational levels and their attitude toward determination of institutional objectives and consequently, their application of TQM principles.

According to MoE (2010), in Zambia it has been shown that the government attaches great importance to teacher education in a bid to improve the quality of education. The government has worked together with several stakeholders such as donor agencies like Japan International Cooperation Agency (JICA), non-governmental organizations and schools. The government, together with other stakeholders, have embarked on several initiatives. Some of these initiatives include Teacher Group Meeting (TGM), Subject Meetings at the Resource Centre (SMARC). Despite all these initiatives, it was still important for the researchers to conduct the research in order to identify the TQM principles being practiced and the extent to which these principles have been practiced and finally highlight the factors affecting the practicing of these principles.

2. Theoretical framework

Deming's theory (1986) provides a useful framework for TQM explanation on customer satisfaction through continuous improvement in an organisation. The sore purpose of the theory was to improve the quality of products and it was anchored on the fourteen key principles in order for managers to transform the effectiveness of the business. The Deming theory provides an intensive, long-term effort directed at the creation and maintenance of the high standards of product quality and services expected by the customers and for this research, the high quality education has to be continuously applied to students as they are the customers. The 14 points of Deming's theory which can be used to seek sources of improvement are;

1. Create constancy of purpose towards improvement
2. Adopt the new philosophy by management and workers alike
3. Do not depend on quality inspection but build quality into the product and process.
4. Choose quality suppliers over low cost suppliers to minimize variation in raw materials and supply
5. Improve constantly to reduce variation in all aspects such as planning, production and service.
6. Institute training on the job. If people are inadequately trained, they will not all work in the same way and this will introduce variation.

7. Institute leadership not supervision to get people to do a better job, not just meet targets.
8. Drive out fear. Deming sees fear as counter-productive in long-term because it prevents workers from acting in the organization's best interest.
9. Breakdown internal barriers between departments in an organization. Departments in an organization are internal customers to each other and must work together.
10. Eliminate slogans. It's not people who make most mistakes. It's the processes they are working within. Harassing the workforce without improving the processes they use is counter-productive.
11. Eliminate Management objectives instead production targets as encouraging the delivery of poor-quality goods.
12. Remove barriers to worker satisfaction including annual appraisals.
13. Encourage self improvement and education for all.
14. Everyone is responsible for continual improvement in quality and productivity particularly top management.

The research identified the key principles of TQM in secondary schools and the extent to which these principles are practiced in order to seek quality, continuous improvement and teamwork in these learning institutions. The Deming theory was used to provide a framework for TQM in order to explain customer satisfaction through continuous improvement as an effective and efficient element of the organization and its processes. For this research the principles of TQM considered are; management, teachers as employers, students as employees and customers, and acquiring knowledge as a product. Out of the fourteen key principles expounded by Deming and modified by Lockwood (1992) to form a framework for the application of TQM principles in schools, the research focused on the principles numbered 2, 6,7,10, 13 and 14. The purpose for the selection of only 6 out of 14 principles was

2.1 Conceptual Framework

In Zambia, the management of secondary schools has adopted the kind of management used in manufacturing industries with a view of producing quality educated boys and girls. This kind of management focuses on the quality of the pupil "produced" at the end of the learning process and is assessed using standard examination at either grade nine or grade twelve. In particular, Deming's principles of management have been adopted in schools in Zambia. This kind of management which is aimed at bringing out the required results involves several factors including secondary school managers, teachers, parents and pupils who work together for a common goal. Thus the quality of education denoted by the quality of pupils and expressed through performance is the result of the function of good management adopted from Deming. Thus, the quality of pupils is dependent on the practice of TQM principles and vice versa. In the conceptual framework (figure .1), the school management institutes TQM principles which involve teachers, pupils and other stakeholders including parents. Teachers

and other non-teaching staff implement TQM principles to give quality service and teaching to the pupils who gain quality information, skills, values, attitudes and many more.

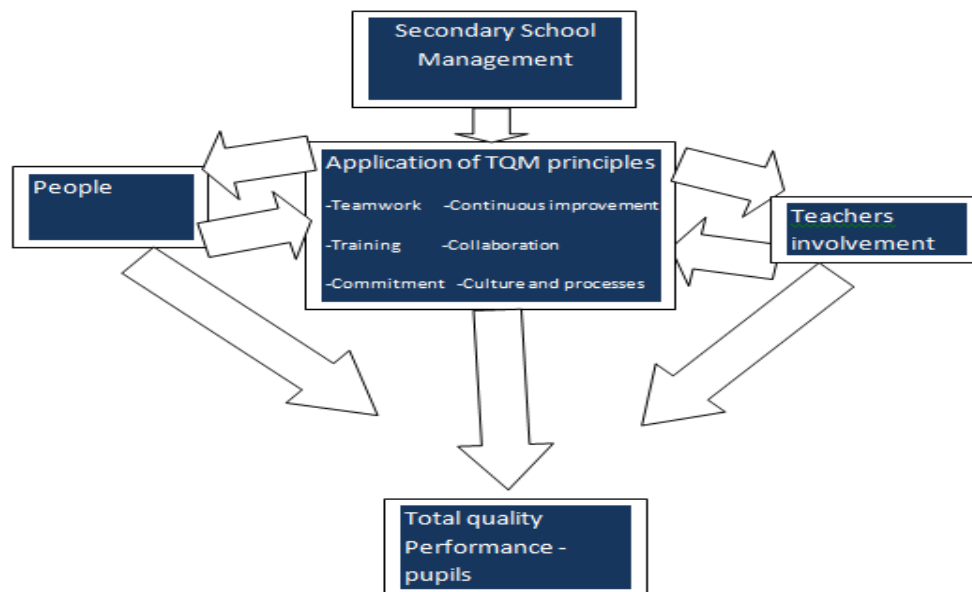


Figure 1: A model of TQM principles and its customers in education

As earlier pointed out the Deming theory does not just apply to manufacturing industries but it also applies to educational institutions. Tribus (1987) provided a compelling argument for applying TQM principles in the school setting. Tribus (1987) argued that quality in education is what makes learning a pleasure and a joy. In the education circles, managers must focus, first and foremost, on their suppliers and customers. In a TQM organization, everyone is both a customer and supplier; this confusing concept emphasizes “the systematic nature of the work in which all are involved”. In other words, teamwork and collaboration are essential. Traditionally, education has been prone to individual and departmental isolation. However, according to Bonstingi (1988), this outdated practice no longer serves educationists and one cannot boast that when he or she closes the classroom door, the pupils in the classroom becomes his or hers. This notion is too narrow to survive in a world in which teamwork and collaboration result in high-quality benefits for the greatest number of people. The application of the first pillar of TQM to education emphasizes the synergistic relationship between the “suppliers” and “customers”. The concept of synergy suggests that performance and production is enhanced by pooling the talent and experience of individuals.

The research focused on the following key principles expounded by Deming and modified by Lockwood (1992) to form a framework for the application of TQM principles in schools.

2.1.1 Have managers who become leaders for change

According to Taggar and Ellis (2007), teachers who emphasize content area, literacy and principle-centred teaching provide the leadership, framework, and tools necessary for continuous improvement in the learning process and therefore continuous improvement is made possible as that supervision in secondary schools aims at helping teachers, support staff and pupils do a better job.

2.1.2 Consistently strive to improve the service provided to students.

Organizations using a TQM system engage in incremental improvements continuously to affect the quality of the business's processes and products. A continuous improvement approach requires teachers to strive for zero defects and efficiency in all processes of the school. Continuous-improvement activities seek areas requiring improvement in a proactive manner (Taggar and Ellis, 2007).

2.1.3. Institute on the job training for all: teachers, administrators and students.

Companies provide training in the tools, concepts and techniques of the quality management system to all employees. TQM in secondary schools create an atmosphere of teamwork and empower workers to take the initiative to improve processes and quality. These systems cannot function without the involvement and encouragement of upper management. Adoption of both insights and experiences comprising knowledge either embodied in individuals or embedded in organizations as processes or practices. Porter (1985) stated that TQM in secondary schools focuses on organizational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, integration and continuous improvement of the organization.

2.1.4. Encourage team-teaching and, by so doing, eliminate the barriers between teachers or departments.

The synergy required to make quality improvements comes from people working in harmony. The team is considered to be the essential building block for delivering quality and has a number of important functions. This is also supported by Crosby (1979) who affirms that too often in education teamwork is just expected to happen, but the fact is that this is a skill which has to be learnt in order to be part of.

2.1.5 Change the focus in education from quantity to quality and by so doing remove barriers that deprive students, teachers and school administrators of their pride in workmanship.

It is important that the leaders guide, support and empower not only teachers, but all those involved in the teaching-learning process. This promotes commitment and involvement in improving students' learning. Spanbauer (1992) argues that educational leaders should guide and assist others to develop a similar set of characteristics, encouraging shared responsibility and a style which will create an interactive working environment.

2.1.6. Involve everyone in transforming the school into a quality environment.

Everybody in the school should work to accomplish its transformation. TQM systems rely on the people working in an organization to improve quality and processes. Every individual from top-level managers to the lowest level employee should be involved in the continuous improvement of processes in organizations using this system.

2.2 Hypotheses Development

Based on the conceptual framework in figure 1, the hypotheses were then developed.

Hypothesis 1

H₀: Teamwork as a TQM principle is not practiced in secondary schools in Lusaka.

H₁: Teamwork as a TQM principle is practiced in secondary schools in Lusaka.

Hypothesis 2

H₀: Continuous improvement as a TQM principle is not practiced in secondary schools in Lusaka.

H₁: Continuous improvement as a TQM principle is practiced in secondary schools in Lusaka.

Hypothesis 3

H₀: Training as a TQM principle is not practiced in secondary schools in Lusaka.

H₁: Training as a TQM principle is practiced in secondary schools In Lusaka.

Hypothesis 4

H₀: Collaboration between Management and pupils as a TQM principle is not practiced in secondary schools in Lusaka.

H₁: Collaboration between Management and pupils as a TQM principle is practiced in secondary schools In Lusaka.

Hypothesis 5

H₀: Management commitment as a TQM principle is not practiced in secondary schools in Lusaka.

H₁: Management commitment as a TQM principle is practiced in secondary schools In Lusaka.

Hypothesis 6

H₀: The School culture and its' processes as a TQM principle is not practiced in secondary schools in Lusaka.

H₁: The School culture and its' processes as a TQM principle is practiced in secondary schools In Lusaka.

3. Research Methodology

3.1 Survey Administration

The total population of secondary school teachers in Lusaka district is appropriately 2,201. However, due to factors such as serving teachers going for further training under the government programme (fast track), vocation and maternity leave and other factors contributed to a lower number of teachers. Therefore the accessible population was estimated to be 1,740 at the time the research was conducted. The research sample for this research was 120 secondary school teachers in Lusaka District drawn from 10 secondary schools which were stratified into 5 zones namely Lusaka central, Chilenje, Mumuni, Chibolya and Chunga zones.

3.2 Sampling Design

The research employed a purposive and simple random sampling where a total of 120 respondents were randomly sampled out of 1,740. Senior standards officers (SESOs) who ensure that schools are run effectively and efficiently were also interviewed. The SESOs interviewed were specialists in English, maths, social sciences and business studies. Specialists in other disciplines could not be reached as they were not available.

3.3 Data Collection

3.3.1 Questionnaires

Structured questionnaires were used to collect data from secondary school teachers across a cluster of schools from 5 zones in Lusaka district. These questionnaires were administered to secondary school teachers. Before the survey was launched, a pre-test was conducted with Arakan Boys Secondary School to identify potential problems with the questionnaires and to prevent biases therefore ensuring effectiveness. The representative sample involved 5 secondary school teachers who were used to validate the instruments that were then used. After piloting the questionnaire, adjustments were made on some questions. The questionnaire was based on 6 principles from Deming theory and modified theory by Lockwood. These theories formed a section in the questionnaire. Each section then comprised of an average of 5 questions and a probing question at the end of each section. In order to avoid ambiguity and enhance clarity of what was required from the respondents, the questionnaire had the following parts:

The first part of questionnaire focussed on demographic issues. These assessed the secondary school teachers on issues such as gender, age, marital status, and employee work position, and departmental subject, level of education and length of service as an educator.

Section A of the questionnaire aimed at exploring whether teamwork was used in schools to improve and coordinate work in order to provide quality education or not.

Section B focussed on whether continuous improvement through assessment exercises was effected in secondary schools to provide quality education or not.

Section C of the questionnaire was mainly aimed at exploring the management commitment in the provision of quality education.

Section D of the questionnaire aimed at exploring whether training of teachers was being practised or not.

Section E of the questionnaire assessed the collaboration between management and teachers

Section F of the questionnaire explored whether the school culture and processes contributed to attaining total quality management in secondary schools.

3.3.2 Interviews

Structured interviews were conducted with four senior standards officers (SESOS) at provisional level. The main role of the SESOs is to monitor whether schools in Lusaka district are providing quality education. The interviews were conducted in their offices during working hours. Even though it was a guided interview, the minimum period each interview lasted was 30 minutes.

3.3.3 Triangulation

More than one method was used in the data collection. This was done to strengthen on the weakness of using one method and to get accurate information because the two methods helped to validate the information.

3.4 Data Analysis

A total number of 100 respondents were successfully interviewed out of the 120 questionnaires which were distributed. These were from 10 Government and Government aided Secondary schools within Lusaka District. The selection of these schools was carefully tailored to capture both technical and non-technical schools covering a wider range of characteristics including historical performances. The data collected from the questionnaires was presented and analyzed using frequency tables in order to indicate variable values and the number of occurrences in terms of frequency. A frequency distribution table was used for each question to summarize the data from the respondents.

The organised data was interpreted on account of concurrence using statistical package for the social sciences (SPSS), a software package for analysing data of primary nature. Microsoft excel was also used to produce graphs based on the data analyzed using SPSS. Secondary data was analysed manually by the researcher

4. Research Findings

To determine whether the set H_0 or H_1 hypothesis were supported, goodness-of-fit tests was used. The tests show chi-square values and p-values. The p-value is the probability that the responses made are random (by chance) and that the difference observed between the expected values and observed values (i.e. Correlation, or association) are due to random sampling. A p-value below 0.05 was considered statistically significant, while one of 0.05 or greater indicated the distribution was random.

After the analysis using good-of-fit tests, all the set H_1 (positive) hypothesis were supported and the following tables are explained in detail.

Table 1: Results for the hypotheses on Teamwork

Hypotheses	Chi-square	p-value	Comments
Teachers work closely together as a team	47.06	0.000	Supported
Support Teamwork for coordination and improve quality	70.64	0.000	Supported
Management is more in favour of team recognition rather than individual recognition.	80.96	0.000	Supported
Management implements decisions which the majority of teachers want.	92.72	0.000	Supported
Do you think your school should improve working as a team?	116.40	0.000	Supported

Table 1 showed that all the positive hypotheses on teamwork were supported (p -value < .001). The distributions for all the items are leaning towards agreement. Thus, teamwork as a TQM principle was practiced in secondary schools in Lusaka district.

The hypothesis has been supported as ($X^2 = 70.64$, p -value = $4.58e-16$). At 95% confidence level there is sufficient evidence to conclude that teachers in the secondary schools support teamwork as one of the best way to coordinate work and improve quality.

The hypothesis has been supported as ($\chi^2 = 80.96$, p -value = $5.28e-16$). At 95% confidence level there was sufficient evidence to conclude that management in the secondary schools was more in favour of team recognition rather than individual recognition.

The hypothesis has been supported as ($\chi^2 = 92.92$, p -value = $1.80e-18$). At 95% confidence level there was sufficient evidence to conclude that management implements decisions which majority of teachers want.

The hypothesis have been supported as ($\chi^2 = 116.40$, p -value = $3.14e-24$). At 95% confidence level there was sufficient evidence to conclude that respondents think that the school should improve on working as a team.

Table 2: Results for the hypotheses on Continuous Improvement

Hypotheses	Chi-square	p-value	Comments
We carry out monthly tests and end of term examinations.	106.80	0.000	Supported
Pupils have time and place to carry out their	78.68	0.000	Supported

studies.			
School has effective quality improvement plans.	106.40	0.000	Supported
Change Initiatives driven by below par performance.	52.88	0.000	Supported
Educational facilities are provided adequately for pupils.	62.84	0.000	Supported*

Table 2 showed that all the positive hypotheses on continuous improvement were supported (p -value $< .001$). However, the distribution of the education facilities item was leaning towards disagreement. Overall, continuous improvement as a TQM principle is practiced in secondary schools in Lusaka district.

The hypothesis has been supported as ($\chi^2 = 106.80$, p - value $=3.50e-22$). At 95% confidence level there was sufficient evidence to conclude that the respondent's school carries out monthly tests and end of term examinations to measure excellence in service delivery.

The hypothesis has been supported as ($\chi^2 = 78.68$, p - value $=1.58e-15$). At 95% confidence level there was sufficient evidence to conclude that the pupils have the time and place to carry out their studies after classes.

The hypothesis has been supported as ($\chi^2 = 106.40$, p - value $=4.26e-22$). At 95% confidence level there was sufficient evidence to conclude that the school has effective quality improvement plans such as guidance and counselling of pupils.

The hypothesis has been supported as ($\chi^2 = 52.88$, p - value $=3.56e-10$). At 95% confidence level there was sufficient evidence to conclude that change initiatives are driven by below par performance in the school.

The hypothesis has not been supported as ($\chi^2 = 62.84$, p - value $=3.14e-12$). At 95% confidence level there was sufficient evidence to conclude that educational facilities are not provided adequately enough for the pupils.

Table 3: Results for the hypotheses on management commitment

Hypotheses	Chi-square	p-value	Comments
Management views quality as being more important than the cost	54.32	0.000	Supported
Management routinely removes barriers to	123.44	0.000	Supported

performance, innovation and quality			
Management is actively involved in communicating the school's vision for quality performance	143.96	0.000	Supported
Management is in routine contact with its teachers and pupils	164.84	0.000	Supported

Table 3 showed that all the positive hypotheses on management commitment were supported (p-value < .001). However, the distribution of the education facilities item was leaning towards disagreement. Overall, management commitment as a TQM principle is practiced in secondary schools in Lusaka district.

The hypothesis has been supported ($\chi^2 = 54.32$, p-value = $1.80e-10$). At 95% confidence level we have sufficient evidence to conclude that management views quality as being more important than the cost.

The hypothesis has been supported as ($\chi^2 = 123.44$, p-value = $5.86e-25$). At 95% confidence level there was sufficient evidence to conclude that management routinely removes barriers to performance, innovation and quality.

The hypothesis has been supported as ($\chi^2 = 143.96$, p-value = $2.57e-29$). At 95% confidence level there was sufficient evidence to conclude that management is actively involved in communicating the school's vision for quality performance.

The hypothesis has been supported as ($\chi^2 = 164.84$, p-value = $9.20e-34$). At 95% confidence level there was sufficient evidence to conclude that management is in routine contact with its teachers and pupils.

Table 4: Results for the hypotheses on training

Hypotheses	Chi-square	p-value	Comments
Serving teachers have a programmed plan in the school for further or in-service training.	84.44	0.00	Supported
Staff meets from time to time discuss educational matters under the guise of subject specialists.	140.96	0.00	Supported
There is a criterion for post training of teachers such as area of specialization, performance and academic merit of the teacher involved.	68.72	0.00	Supported
There are strict regulations with regards to those who go for post training under government sponsorship.	66.80	0.00	Supported
Training program at your school is tailored to meet the academic needs of the school.	50.72	0.00	Supported

Table 4 showed that all the positive hypotheses on training were supported (p-value < .001). However, the distribution of the education facilities item was leaning towards disagreement. Overall, training as a TQM principle is practiced in secondary schools in Lusaka district.

The hypothesis has been supported as ($\chi^2 = 84.44$, p- value =9.86e-17). At the 95% confidence level there was sufficient evidence to conclude that serving teachers have a programmed plan in the school for further or in-service training.

The hypothesis has been supported as ($\chi^2 = 140.96$, p- value =1.12e-28). At the 95% confidence level there was sufficient evidence to conclude that the members of staff in the schools were divided into subject departments and they met from time to time to discuss educational matters and day to day problems under the guidance of subject specialists.

The hypothesis has been supported as ($\chi^2 = 68.72$, p- value = 1.89e-13). At the 95% confidence level there was sufficient evidence to conclude that there is criterion for post training of teachers such as area of specialization, performance and academic merit of the teacher involved.

The hypothesis has been supported as ($\chi^2 = 66.80$, p- value = 4.74e-13). At the 95% confidence level there was sufficient evidence to conclude that there are strict regulations with regards to those who go for post training under government sponsorship.

The hypothesis has been supported as ($\chi^2 = 50.72$, p- value = 9.87e-10). At the 95% confidence level there was sufficient evidence to conclude that there was a training program at the school that is tailored to meet the academic needs of the school.

Table 5: Results for the hypotheses on collaboration between management and pupils

Hypotheses	Chi-square	p-value	Comments
School Management is aware of the level of pupil satisfaction	97.10	0.00	Supported
School Management listens to pupils' complaints	133.30	0.00	Supported
School Management uses the information collected from pupils to improve the service delivery.	106.76	0.00	Supported
Pupils have a forum to lodge their quality related complaints to the school management.	95.72	0.00	Supported

Table 5 showed that all the positive hypotheses on collaboration between management and pupils' were supported (p -value $< .001$). However, the distribution of the education facilities item was leaning towards disagreement. Overall, collaboration between management and pupils as a TQM principle is practiced in secondary schools in Lusaka district.

The hypothesis has been supported as ($\chi^2 = 97.10$, p - value = $4.07e-20$). At 95% confidence level there was sufficient evidence to conclude that school management was aware of the level of pupil satisfaction.

The hypothesis has been supported as ($\chi^2 = 133.30$, p - value = $7.67e-28$). At 95% confidence level there was sufficient evidence to conclude that school management listens to pupils.

The hypothesis has been supported as ($\chi^2 = 106.76$, p - value = $1.98e-21$). At 95% confidence level there was sufficient evidence to conclude that school management uses the information collected from pupils to improve the service delivery.

The hypothesis has been supported as ($\chi^2 = 95.72$, p - value = $4.21e-19$). At 95% confidence level there was sufficient evidence to conclude that pupils have a forum to lodge their quality related complaints to the school management.

Table 6: Results for the hypotheses on school culture and processes

Hypotheses	Chi-square	p-value	Comments
The mission statement, the motto and the vision of the school depict a quality related school	134.96	0.00	Supported
The status quo between school managers and the teachers is so pronounced that it can create fear among teachers.	36.68	0.00	Supported
Teachers are empowered to take direct action is likely to affect quality	109.40	0.00	Supported
All school processes have been designed to meet quality standards	110.72	0.00	Supported

Table 6 showed that all the positive hypotheses on school culture and processes were supported (p -value $< .001$). However, the distribution of the education facilities item was leaning towards disagreement.

The hypothesis has been supported as ($\chi^2 = 134.96$, p - value = $2.11e-27$). At 95% confidence level there was sufficient evidence to conclude that the mission statement, the motto and the vision of the school depict a quality related school.

The hypothesis has been supported as ($\chi^2 = 36.68$, p - value = $6.94e-07$). At the 95% confidence level there was sufficient evidence to conclude that the status quo between school managers and the teachers is so pronounced that it can create fears among teachers.

The hypothesis has been supported as ($\chi^2 = 109.40$, p - value = $5.49e-22$). At 95% confidence level there was sufficient evidence to conclude that teachers are empowered to take direct action whenever action is likely to affect quality.

The hypothesis has been supported as ($\chi^2 = 110.72$, P - Value = $2.89E-22$). At 95% confidence level there was sufficient evidence to conclude that all school processes have been designed to meet quality standards.

5. Discussion

The discussions on the results from the research are presented according to the objectives that were set.

According to Table 1, the study accepted the alternative hypothesis that schools in Lusaka practised teamwork as a TQM principle. In most cases, this principle was practised without knowing. This was identified during the course of conducting the research and therefore it has reflected on what government is undertaking to attain quality in schools. There are initiatives that have been undertaken by the Zambian government to explore ways of promoting quality teaching which include: school programme of in-service for the term

(SPRINT) and its components are: Teacher Group Meeting (TGM), teachers of different subjects and grades meet to discuss different issues of common interest, Subject Meetings at the Resource Centre (GRACE), Head Teacher's In-Service Meeting (HIM) are among others. Another stride which the Government has undertaken called School based Continuing Professional Development (CPD). In all these smaller factions, teamwork is encouraged and maintained in Lusaka secondary schools. All this is aimed at working together as a team in order to promote quality in secondary schools. The results from this research are supported by Cotton (1987) who conducted a similar study on applying TQM principles to Secondary Education at Mt. Edgecumbe High School in Alaska. He found out that teachers attend conferences all the time in order to improve the quality of education and that they all worked as a team.

Considering the results from the study, continuous improvement in secondary schools of Lusaka is being practiced through carrying out monthly tests and end of term examinations in order to measure excellence in service delivery. In addition, pupils are given time and space to carry out their studies after classes. This is being done through time allocated for such activities as prep and lab experiments. Additionally, the Schools have effective quality improvement plans such as guidance and counselling to pupils and change initiatives are driven by below par performance in the schools. The school management uses parents and pupils' feedback to improve the results of pupils. This is usually done on open days where parents are invited to discuss their children's results and how these results can continuously be improved. However, some teachers commented that even though there was continuous improvement, management did not provide adequate learning and teaching materials in all secondary schools. Therefore, only the question on learning materials accepted the null hypothesis that learning materials were not adequately provided. This study reveals the argument that was made by Cotton (1987) about a teacher from Mt. Edgecumbe High School who attended a conference on Total Quality Management (TQM) conference in Arizona. The teacher learned about the "fourteen points" for quality in business operations and the knowledge acquired by the teacher was later beneficial to the school. Therefore Cotton (1987) research affirms the needs to support continuous improvement in schools were learning materials are not adequate. Further Cotton (1987) views, contrasts significantly with the study in Kenya (Ngware et al., 2006) conducted to establish the practices of TQM in some secondary schools. The findings indicated that Board of Governors and chairpersons in secondary schools were not providing the necessary leadership that would promote TQM practices necessary for the schools' continuous improvement.

The researchers found that continuous training was done in different ways in Lusaka and has been interwoven with the policy of the ministry as noted in programs aimed at training in-service teachers and those not yet teachers. The government introduced a project known as "Strengthening Teachers Performance and Skills through school based continuing professional development (STEPS). The main thrust of the project was to address issues of quality with particular emphasis on capacity development of teachers of science and mathematics in both basic and high schools. These projects foster continuous improvement of teachers' knowledge, skills and instructional competences. In some schools, members of staff

are divided into subject departments and meet from time to time to discuss educational matters and day –to-day problems under the guidance of subject experts in departmental meetings. The finding in this research can therefore be compared to a research that was conducted in Turkey to determine the applicability of total quality management at vocational high schools (VHSs). From the appropriateness analysis of findings, the researchers concluded that, there was a relation between administrators' education levels and their perception of quality, administrators' educational fields and their attitudes toward 'clients' and administrators' educational levels and their attitude toward determination of institutional objectives (Tekin, 2009; Garvin, 1987). Hence the government of Turkey introduced mechanisms to continuously train teachers and educational administrators in vocational High Schools.

In some schools, it was found that collaboration between management and pupils was done through student councils. This is a student body which routinely meets administrators to discuss problems that befall them. Collaboration and teamwork were practiced unknowingly in the schools. This has been supported by Bonstingi (1988) as he affirms that the Deming's concept of TQM provides guiding principles and pillars for the needed educational reform. He further alludes that, one of the pillars is synergistic relationships where teamwork and collaboration are essential. He believes that the concept of synergy suggest that performance and production is enhanced by pooling the talent and experiences of individuals. Therefore, the researchers concluded that schools practiced TQM principles as indicated by the findings in Table 5.

It was established that in most schools, there was commitment from management of working together and bringing pupil-satisfaction and also creating a friendly environment for pupils, teachers and management on the other. Commitment to customer satisfaction in schools by management has been evidenced through various activities. For instance, it was observed that at 95% confidence level, management routinely removed barriers to performance, innovation and quality. Also at 95% confidence level, management was actively involved in communicating the school's vision for quality performance while at 95% confidence level; management was in routine contact with its teachers and pupils.

The findings of the study also indicated that, at 95% confidence level the mission statement, the motto and the vision of the school depict quality related activities. This was important in showing how and what schools are doing to improve quality. It was also established in this study that at 95% confidence level, teachers were empowered to take direct action whenever action is likely to affect quality. This system created in secondary schools was good for achieving and practicing TQM principles. These findings was similar to what Altahayneh (2014) argued. Altahayneh (2014) alludes to the fact that "a system of ongoing processes in academics should be used so that the system can be examined to identify the flawed processes that allows its participants to fail." He further argued because systems are made of culture and processes hence the improvements made in the quality of those processes largely determine the quality of the resulting product. The TQM concept however implies that students and teachers are less to blame for failure than the system in which they work. For instance, the US Department of Defence suggested TQM as both a philosophy and a set of

guiding principles that represent the foundation of a continuously improving organization. Their definition of TQM is 'a disciplined management process under the leadership of the top executive, involving everyone in the organization in a cooperative effort to achieve a quality product or service through continuous process improvement combined with continuous life cycle cost reduction to satisfy customer needs and maximize combat capability' (DOD, 1990). It can then be argued that the human factor plays a major role in TQM. The activity of everyone participating in the achievement of one objective is especially significant and valuable, leading to their taking ownership of TQM.

6. Conclusion

It is clear from the research findings that to a large extent all the identified TQM principles are being practiced in Lusaka district. There is therefore need to strengthen the practice of TQM principles by paying particular attention to some issues. In the case of the teamwork principle, there is need to strengthen the activities that involve teamwork in secondary schools by regular meetings and implementing the resolutions. For continuous improvement, there is need for providing teaching and learning materials adequately in the secondary schools as they are one of the things that slowed down the process of achieving timely continuous improvement plans. The training principle is practiced but most cases it hinges on favouritism. Management Commitment is very cardinal if TQM practices are to be implemented therefore there is need for management to take centre stage in fostering implementation of activities. Moreover, it was concluded that there was collaboration between management and pupils through student councils which were formed in schools to air out their views and grievances to management. Finally, all the secondary schools in Lusaka, school culture and processes were in conformity with the TQM principles

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