The Development of a Sustainable Quality Management Framework for Libyan Higher Education System

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Abstract

An increasing interest in implementing Total Quality Management (TQM) in the Higher Education Sector has been observed over the past decade. However, TQM sustainability is one of the major challenges facing this task. In this context, experts have emphasised on the need for understanding the synergies between TQM and sustainability models. The topic "Sustainable Quality Management"(SQM) explored through this research is an evolutionary future-oriented concept that is synonymous with "Sustainable TQM". This paradigm aims to integrate TQM with economic, environmental, and social an aspect which is commonly referred as the Triple Bottom Line (TBL).

The aim of this study was the development and evaluation of a framework for SQM in the Higher Education Sector with a particular focus on the Libyan system. A sequential exploratory design was adopted to achieve this objective that involved quantitative, qualitative, and mixed methods techniques. Through a review of key literature Eight Critical Success Factors (CSFs) and 72 Quality Action Programs (QAPs) concerning SQM were identified. Also, the links between the design criteria adopted by TQM models (Deming, PDSA, and EFQM) and Sustainability models (TBL and Five Capitals).

These links were analysed in the cultural context of the Arab and Libyan Higher Education System, and five types of QAPs implementation gaps visible in the Libyan Higher Education System were evaluated. Through a structured questionnaire comprising 72 questions on various QAPs, responses collected from 678 academic and non- academic staff of two Libyan Universities, National Quality Centre and the Education Ministry were statistically analysed for trends and significant differences among the 26 groups classified for the study. These results were combined with 31semi - structured interviews that portrayed opinions of the Libyan Higher Education experts, using mixed methods techniques.

This study identified several environmental and ethical QAPs that are relevant to be applied through TQM models in the TBL perspective of University campuses. In general, low levels of implementation of SQM QAPs was observed in Libyan Higher Education System due to lack of awareness, inadequate knowledge of quality management tools and techniques, the absence of quality training, incompetence towards evolving SQM policies and strategies and lack of measurement of key results.

The thesis concludes with the SQM framework for steering the leadership of the Libyan Higher Education System towards improved sustainable quality standards and associated policy and strategy.

Keywords: Sustainable Quality, TQM, Critical Factors, Quality Action Programme, Higher Education Quality, Libya, PDSA, EFQM, TBL, Five Capitals.

Dedication

To my parents, my brothers, my sisters, my all friends, all staff at De Montfort University, Al Jabel Al Gharbi University - Gharyan, and Ministry of Higher Education and Scientific Research - Libya.

Acknowledgments

﴿ بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ ﴾

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ ﴿١﴾ خَلَقَ الْإِنسَانَ مِنْ عَلَقٍ ﴿٢﴾ اقْرَأْ وَرَبُّكَ الْأَكْرَمُ ﴿٣﴾ الَّذِي عَلَّمَ بِالْقَلَمِ ﴿٤﴾ عَلَّمَ الْإِنسَانَ مَا لَمْ يَعْلَمْ ﴿٥﴾

صدق الله العظيم

Read! In the Name of your Lord, Who has created (1) has created man from a clot (2) Read! And your Lord is the Most Generous (3) who has taught by the pen (4) has taught man that which he knew not (5).

My heartfelt praises are due to the Grace of Allah, which has rendered me with good health, strength and perseverance to carry out this work, despite many challenges I had to face during the difficult times that Libya has gone through the past few years. I hope Libya's stability to reach the happiness and access to security and safety.I would like to thank my supervisor Prof. Mark Lemon for his continuous help, guidance and sound advice throughout the study which has made this project achievable.

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Table of Abbreviations

ABET	Accreditation Board of Engineering & Technology
ACGU	Academic staGharyan University
ACTU	Academic staff, Tripoli University
AMS	Accreditation Management System
BEA	Business Excellence Awards
BNQP	Baldrige National Quality Program
BPCs	Basic People's Congresses
CERA	Cambridge Energy Research Associates
CHE	Conference on the Human Environment
CPD	Continuous Professional Development
CSD	Commission on Sustainable Development
CSFs	Critical Success Factors
CSR	Corporate of Social Responsibility
EFQM	European Foundation for Quality Management
FF	Forum for the Future
FRD	Federal Research Division
GACs	Group Averages for Critical Success Factors
GAE	General Authority for Environment
GAQs	Group Averages for Quality Action Program
GAM	Global and Arab Models
GCR	Global Competitiveness Report 2005-2006
GDP	Gross domestic product
GPCs	General People's Congresses
HDI	Human development Index
HEFCE	Higher Education Funding Council of England (HEFCE)
HEQC	Higher Education Quality Council's
HES	Higher Education System
ICT	Information and Communication Technologies
ISO	International Organization for standardization
KWMR	Kruskal-Wallis Mean Rank
LEQAAC	Libyan Education Quality Assurance And Accreditation Centre
LME	Libyan Ministry of Education
LNR	Website of Studio Ricerche Social Libyan National Report
MBNQA	The Malcolm Baldrige National Quality Award
MENA	The Middle East and North Africa
MWMR	Mann-Whitney Mean Rank.
NAHE	Non- Academic Staff, Higher Education Secretariat
NAQC	Non- Academic staff, Quality Centre
NASR	National Authority for Scientific Research
NCES	National Centre for Education Statistics
NI	Online publication of Net Industries
PDSA	Deming's Plan - Do - Study- Act
QAAC	Quality Assurance and Accreditation Centre
QAPs	Quality Action Programs

QCI	Quality Consciousness Indices
QCSE	Quality Consciousness State Efficiency
QM	Quality Management
SD	Sustainable Development
SI	Sustainability Index
SIM	Sustainability Index Programs
SM	Scientific Management
SPC	Statistical Process Control
SPCHE	Secretary of the Peoples Committee on Higher Education
SPSS	Statistical Package for the Social Sciences
SQM	Sustainable Quality Management
SRS	Website of Studio Ricerche Social
TBL	Triple Bottom Line
TQM	Total Quality Management
TQMII	Total Quality Implementation Index
TUT	Third Universal Theory
TWHED	The World Higher Education Database
UNCED	United Nations Commission on Environment and Development
UNDP	United Nations Development Programs
USDE	The United States Department of Education
USDS	Annual Report on International Religious Freedom. U.S. Department of State
USCB	Population Pyramids of Libya. U. S. Census Bureau
WCED	The World Commission on Environment and Development
WSD	Whole System Design

Table of Contents

List of Figures

List of Tables

Chapter 1 Introduction

1.1 Background

Rapid developments in Total Quality Management (TQM) in many industrial sectors in the past few decades were primarily driven by global economic competition that leads to excellence in products and services (Deming, 1986). Scholars such as W. Edwards Deming, Joseph Juran, Philip Crosby and others provided major contributions that revolutionised quality thinking (Youssef, 2006). Although the origins of TQM were particularly oriented towards the manufacturing sector, other sectors also chose to adopt TQM primarily because of its success in manufacturing. The term "Total" implies that quality is important in every part of the organisation including processes, services, products, suppliers, customers, and internal and external stakeholders (Dias, 1998b).

The challenges faced in long – term sustainability of TQM have stressed the need for research in this area (James,1994), TQM integrates a set of values, tools, and techniques, Sustainability of TQM implies sustainability of these values, tools, and techniques (Svensson, 2006). Dale (1996) identified this as a critical issue of TQM and this view was further supported by Elkington (2011):

"On the sustainability side, we often forget the intense evolutionary curve that the quality movement raced up in the 1980s as new standards and expectations triggered immense changes in business. So, the fact that TQM does not yet fully embrace sustainability today does not rule out a powerful convergence in the future".

The primary focus of this study was to explore a framework towards a "Sustainable TQM" that leads to an understanding of the synergies between sustainability and TQM in a higher education context. Therefore, the framework of "Sustainable Quality Management" (SQM) explored through this study, is predominantly oriented towards sustainability of TQM values, tools, and techniques (Dale, 1996; Svensson, 2006).

It is logical that a Sustainable Quality Management framework should explore the synergies between the paradigms of sustainability and TQM. Sustainability offers solutions for pursuing development while ensuring conservation of economic, environmental, and social resources for the present and future generations; these three dimensions are referred as the Triple Bottom Line (TBL) and are often used to measure sustainability in organisations (Lozano-Ros, 2003). The TBL is based on the common

perception that sustainability, in addition to economic performance, also requires that environmental and social concerns be addressed. According to Harris (2000), the TBL dimensions can be addressed through three basic structures which include, firstly, the economic dimension whereby economically sustainable systems should produce goods and services on a continuing basis maintaining manageable levels of government debt, and avoiding sectorial imbalance. Secondly, the environmental dimension which refers to an environmentally sustainable system that maintains a stable resource base, avoids exploitation of renewable resources and depletion of non-renewable resources to the extent of the investment in substitutes, related activities include maintaining biodiversity, atmospheric stability, and other elements of the ecosystem not normally classed as economic resources. Finally, the social dimension which requires a socially sustainable system that achieves distributional equity, social services provision, gender equity, and political participation and accountability. A further discussion of these three dimensions is presented in Section 4.8 .

During the past decade, several authors reported on integrating TBL dimensions into management quality practices (Isaksson and Garvare, 2003; Svensson, 2006). Some of the aspects of this integration included the development of basic philosophies, evaluation of sustainability and synergies between quality and sustainability. A more detailed discussion of these issues is presented in Section 4.8 some examples of these initiatives identified the effect of critical factors related to TQM sustainability which is listed in Table 1.1.

Table 1.1: Evolution of Sustainable Quality Management: Focus of Selected past works

Authors	Focus of work and findings
Schneider et al. (1996)	Emphasised on creating a climate and culture for sustainable organisational change.
Curry and Kadasah (2002)	Considered that the core of TQM is continuity in time which is sustainability; therefore, without sustainability TQM initiatives may end up in operational failures.
Robson et al. (2002)	Identified that TQM drivers have significant influence on operational performance, and then business performance, but only limited impact on sustainability
Issakson and Garvare (2003)	Presented a process model focused on TQM values that are related to sustainability
Jung (2003)	Identified that factors such as individual training, project involvement and organisational structure can influence employee participation in TQM activities that are important for TQM sustainability

Table 1.1 depicts that a Sustainable Quality Management (SQM) framework essentially depends on several Critical Success Factors (CSFs) such as Continuous Improvement, People Focus, and Process Management. A more detailed investigation revealed that eight such CSFs are more often presented in previous studies, and are used the present study (Section 4.10).

1.2 Research Problem

This research has investigated good practice for quality management globally and builds on these practices to identify where Libyan Higher Education can be developed and improved.

Libya's public expenditure on education is about 4% of GDP, which is approximately the average for the Middle East and North Africa (MENA) countries (Youssef, 2006). Despite this the country still faces many challenges to improve quality management in higher education. Although Libya's spending on education has resulted in a remarkable increase in enrolment, this increase has not been met by a corresponding increase in quality. This is, in part, due to a number of concerns that have been expressed about education quality and sustainability. There is a growing body of literature available

about TQM and sustainability, and to the synergy between the two in higher education in developed countries. However, this synergy is still lacking in developing countries and in Libya specifically.

The motivation for this research arose as a consequence of the researcher's own experience during her academic work at the Gharyan University in Libya where she encountered various issues concerning education quality and sustainability. A literature survey revealed a limited number of studies in these areas in the Libyan education sector. Studies conducted in the country generally focused on overall educational issues, most of them at primary and secondary level education. Few studies were concerned with higher education institutions and were oriented towards a cause and effect, rather than a whole system, approach and failed to link quality and sustainability.

In the literature examined, the fundamental notion of sustainability is that resource exploitation should be minimal while resource conservation is maximised so that resources are available for the future. Thus, sustainability can be viewed as a balance between resource exploitation and resources conservation as depicted in Figure 1.1. In this figure, the arrow of this balance points to the centre of the Triple Bottom Line (TBL) which represents sustainability. A deviation of this arrow from the centre implies that imbalances are encountered due to the following:

- Inadequate representation of environmental and ethical dimensions of TBL in Quality Models (for example key TQM literature revealed that little work has been done on Quality Action Programs (QAPs) such as enhancing biodiversity in university campuses and the inclusion of TBL accounting in financial processes of university systems).
- Unsustainable values, tools, and techniques are implemented in TQM processes (for example, if the sustainability value that neutralises harmful

waste is not considered by an organization while implementing TQM processes, it can lead to a TBL imbalance).

In Figure 1.1 these imbalances are represented by red arrows and are drag forces on the balance that can destabilise sustainability causing the pointer to move away from the centre; this means that the TQM implementation moves away from the union of the TBL. On the contrary, the destabilising drag forces can be counteracted by sustainability orientation in TQM through the following:

1. Identification of SQM, CSFs, and QAPs
2. Gap analysis and level of implementation of these QAPs in HE
3. Link analysis of TQM and QAPs.
4. Evaluation of SQM in Libyan Higher Education Sector using the developed framework.

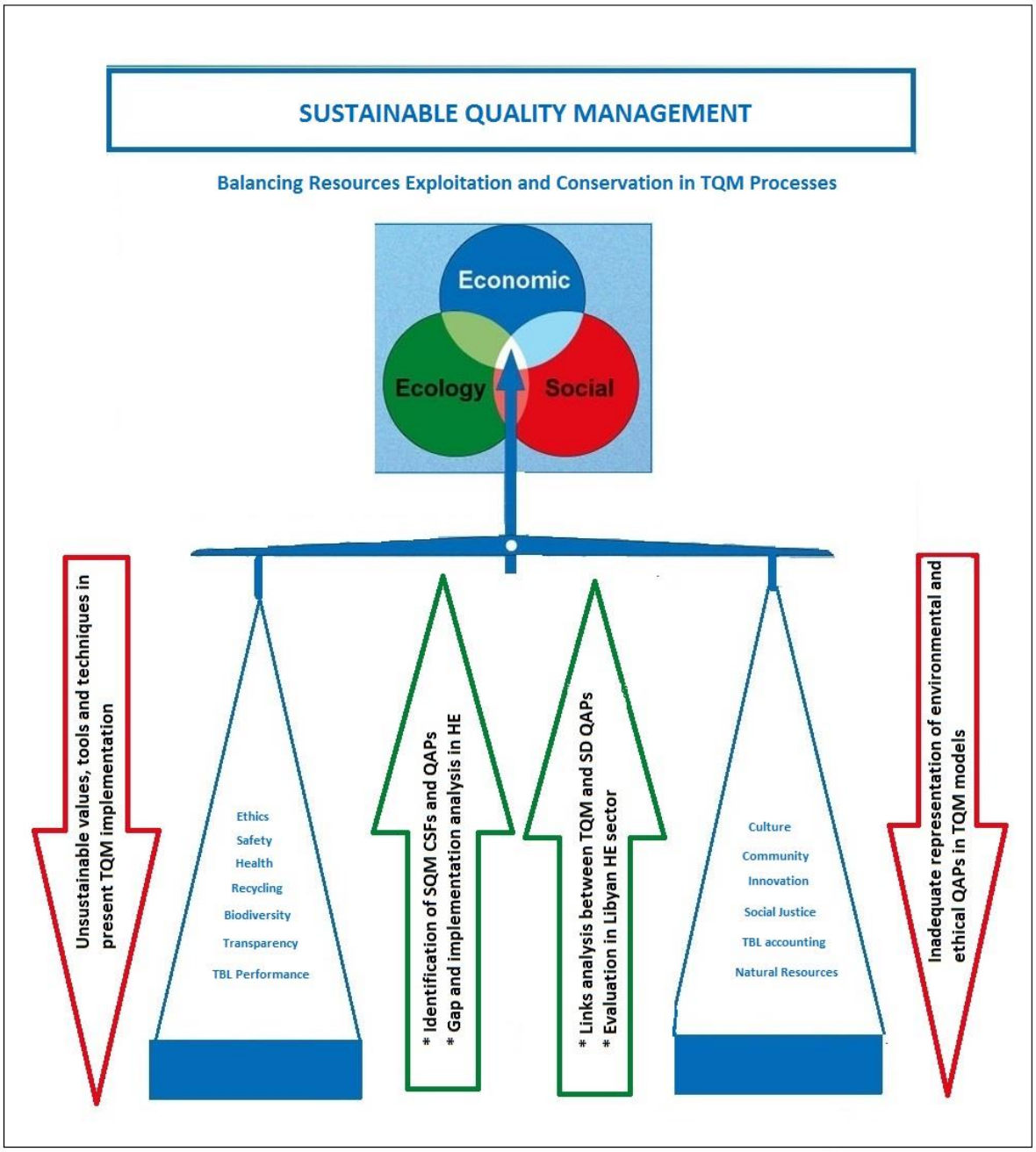

Figure 1.1: Sustainable Quality Management (SQM)

The above model depicts sustainable quality as a balance between exploitation and conservation in Total Quality Management (TQM) processes. The red arrows, which represent unsustainable values, tools and techniques and inadequate representation of environmental issues in Total Quality Management (TQM), create a drag force that results in an imbalance in the sustainable TQM. This can be counterbalanced by the green arrows, which represent the identification of SQM CSFs and QAPs, the gap and

implementation analysis, links analysis between TQM and sustainability and the evaluation of Higher Education (HE) in Libya that brings balance to the TBL in TQM approaches. For these factors in the above model, few studies have been conducted in higher education institutions in Libya. These were oriented towards cause and effect approaches that resulted in what should be done and the discussion on quality matters was found to be limited.

The synergies between quality and sustainability criteria, shown in the example for leadership in Figure 1.2, also exist for other CSFs as well, as shown in the related literature.

Many Critical Success Factors (CSFs) have been identified for SQM (Kumar et al., 2004). Leadership, in the provided example, is one of such CSFs, which can be viewed from both quality and sustainability perspectives. The review of the literature revealed several criteria of this CSF within both the quality and sustainability dimensions as shown in Figure 1.2. The Deming and EFQM models and other past works describe leadership criteria in the quality dimension based on relational and functional aspects of TQM; these include vision, planning, communication with employees, learning, implementing innovative ideas and continuous improvement. On the other hand, the Five Capital Model (FCM) describes leadership criteria in the sustainable development dimension which includes awareness of natural resources, social justice, ethics, and sustainability in financial processes as depicted in Figure 1.2.

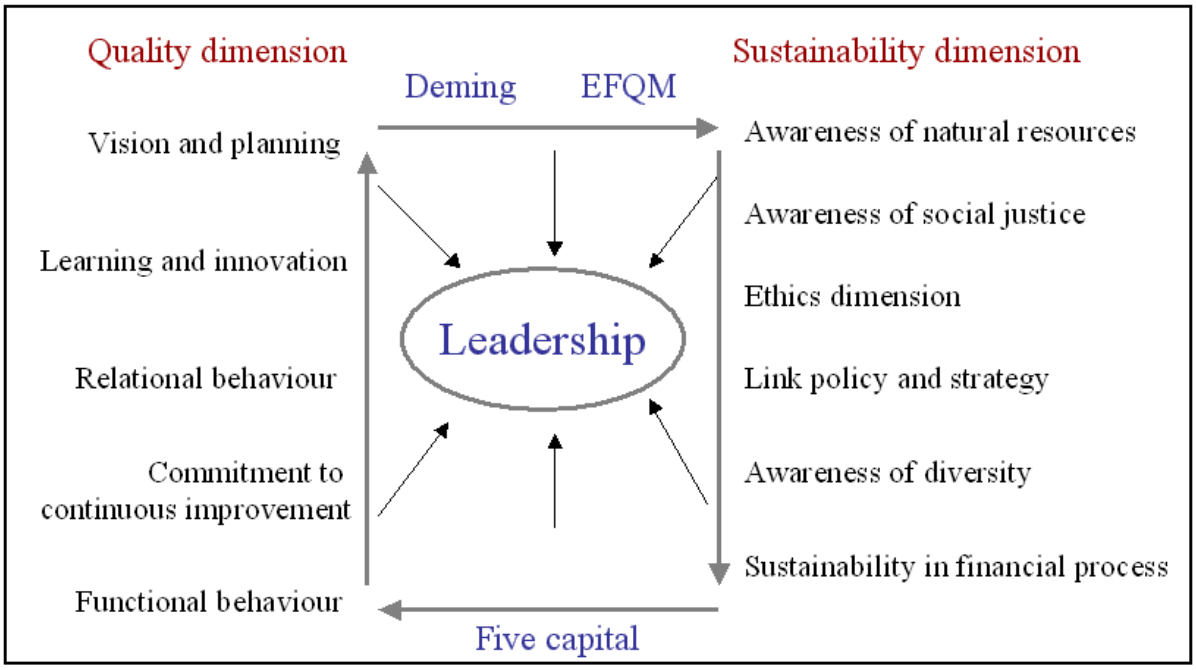

Figure 1.2: An example, describing the linking criteria between quality and sustainability for leadership as the Critical Success Factor

1.3 Research Aim and Objectives

The main aim of this study was to develop and evaluate a framework for Sustainable Quality Management (SQM) in the Libyan Higher Education System. Specific objectives of the study are:

1. To explore and evaluate how sustainability is addressed in key quality management models (Deming PDSA and EFQM).
2. To identify and examine Critical Success Factors (CSFs) as defined in the Deming PDSA and EFQM literature; based on this Quality Action Programs (QAPs) will be evaluated at sub – criteria level of the CSFs identified.
3. To analyse the outcomes of objective (1) and (2) above towards identifying Critical Success Factors (CSFs) of SQM as main criteria and Quality Action Programs (QAPs) a sub-criterion of SQM.
4. To carry out two university-based case studies for examining the validity of these CSFs and QAPs.
5. To develop a framework for SQM in Libyan HE sectors and evaluate this framework through semi – structured interviews at the case study locations.

1.4 Research Questions

The purpose of this study is to explore and develop an SQM framework for higher education based on Deming PDSA and EFQM models. With this general aim, the research questions were specified by combining the objectives of the study with the outcomes of the literature survey and the theoretical gap analysis, presented in chapters 2, 4 and 5 respectively. Specific research questions are:

1 What are the Critical Success Factors (CSFs), as main criteria, and Quality Action Programs (QAPs), as sub–criteria, for achieving Sustainable Quality Management in (SQM) in Higher Education?
2 How is sustainability issues linked to Deming PDSA and EFQM models?
3 How are the (CSFs) and (QAPs) implemented in Libyan Higher Education Institutions and what gaps are visible at various levels of the Libyan HE system?
4 What are the perceptions of Libyan HE stakeholders about the present level of implementation of the SQM and QAPs identified? Are there other issues to be considered and implemented towards enhancing and sustaining quality?
5 What elements are included in an (SQM) framework model that can contribute to enhancing sustaining quality in the Libyan Higher Education system?

1.5 Significance of the Study in the Higher Education Context

The quality of education is a prime theme of this century - the century of knowledge (Verma, 2004). Improvements in educational attainments are accompanied with many remarkable improvements in the society including health and longevity of the population and economic growth of a country. Therefore, the concept of learning has taken an important position in our society, which is connected, to economic growth and social development (Svensson, 2006).

Higher education by its very nature is an international social enterprise that is facing many challenges today (Kaivola and Rohweder, 2007a), this is particularly the case in many developing nations (Grünberg, 2007). Studies by Avdjieva and Wilson (2002) have revealed that universities in developed countries are facing political and cultural barriers to quality improvement programmes. Therefore implementing and sustaining quality in educational institutions has been gaining importance during the past decade (Svensson, 2004; Karsten and Pennink, 2007)

Additionally, the higher education sector is facing increasing levels of market accountability precipitated by legislative processes and the need for higher education managers to justify their actions and demonstrate quality and effectiveness have never been greater (Holmes and McElwee, 1995). Examples of responses to this need include the quality assessment and audit programs of the Higher Education Funding Council for England (HEFCE) and the Higher Education Quality Council's (HEQC) which are instrumental in bringing the required changes in the UK.

Higher Education Institutions (HEIs) also face challenges that increased pressure on them to enhance and sustain the overall quality of education. Many organisations have opted to implement quality programs but often find it difficult to sustain them after one year (Lund and Thomsen, 1994). According to whether quality ethos sustains the very organisation or not is often ignored by the leadership (Schneider et al., 1996). A study conducted by Found (2006) observed that at least 50% of improvement programs of firms met with failures in the longer term. Therefore, long-term implementation or sustainability of quality programs requires evaluating organisations for external factors such as a changing environment in addition to internal parameters such as profitability and cash flow. According to Robson et al. (2002), TQM enablers have the greatest impact on operational performance, but its impact on measures of sustainability such as business growth; competitive advantage and change management were found to be limited. Thus, sustainability is critical for TQM (Dale, 1996).

The present study aimed to resolve these issues by providing support systems and tools for achieving a synergy between quality and sustainability towards a sustainable quality management development framework for Higher Education in Libya. Thus, this study is a contribution to the body of knowledge about TQM, particularly sustainability as a core value of TQM that has been addressed in previous studies.

Therefore, there are wider implications associated with quality and sustainability in higher education and need to address these issues in HE in Libya because of the wider reaching implications for society in general.

1.6 Structure of the Thesis

Based on the research objectives and research design this thesis has been divided into eight chapters. Chapter one presents a background to the research, the research problem, aims objectives and questions and its significance and contribution to knowledge.

Chapter Two introduces the demographic, economic, political, social, and cultural situation related to Higher Education in Libya. Chapter Three presents the methodology for the study, which includes the research paradigm, adopted methods and justification for their use and methods for data analysis. Chapter Four is a comprehensive review of the literature in the fields of TQM and sustainability with particular reference to Higher Education.

Chapter five identifies the eight critical success factors for implementing TQM. These are based on the literature explored in Chapter Two, previous empirical studies, and primary research involving interviews with international experts in the field of quality and opinions elicited from experts in Libyan manufacturing companies. Chapters Six and seven present the study findings and analysis of the quantitative and qualitative data including a discussion of each critical success factor. Chapter eight presents the conclusion to the study, which includes a summary of the findings, contributions of the study and its limitations, and recommendations for the future implementation of SQM in Libyan Higher Education and for future study.

1.7 Summary

This chapter introduced the issues of TQM and sustainability as well as the need for cooperation between them in addressing SQM requirements in higher education in Libya. On this basis, the research problem considering the motivation for the study was presented. The chapter also described the research questions, aim and objectives of the study towards the development of a framework for SQM in higher education and the potential benefits of the application of that framework for addressing SQM in Libya. Accounts of the background, research problem and its significance, as well as the structure of the thesis, are also included. The next chapter will provide the background for integrating the proposed Sustainable Quality Management (SQM) framework within the Libyan higher education system.

Chapter 2 Libyan Higher Education: Back to the Future

2.1 Introduction

Ancient and modern history depicts a picture of Libya not only with many wars and invasions but also a unique cultural identity that persevered these external influences (FRD, 1987; NI, 2009). Along with the frequent shifts in the power regimes, Libya's education system has also changed with impacts on its quality and sustainability. Moreover, another factor, which had some influence on Libya's education system, is religion; despite all of Libya's invaders, the Arabs endured influence on its religion and Islam took a prominent position in defining the Libyan culture (NI, 2009). During the Gaddafi regime, Libya had a political system known as Jamahiriya that has been instrumental in enhancing student enrolment (Youssef, 2006; GSPLAJ, 2004). However, Libya's higher education system is facing some challenges in the area of quality (Checkpoint, 2006; T.A. Rafik*, n.d).

Education in the early twentieth century in Libya was mostly pursued through religious schools until the first college was established in the 1950s after independence. With these marks in the timeline, it can be said that Libyan higher education has a recent origin, that it carries some memories of the past and that the religion and culture are woven into its fabric. Despite these uncommon characteristics, the system has achieved remarkable enrollment and a high literacy level. All these aspects are related to the Critical Success Factors (CSFs) involved in the proposed study and require a depth understanding.

This chapter presents a general country profile of Libya followed by an analysis of secondary data on Libyan education. These discussions lead to deriving inferences on quality and sustainability in higher education in Libya. A brief historic background of Libya is presented (Section 2.3 followed by a country profile (Section2.4). Sub - topics discussed in this section include demographics, religion, political system, socio – economic scenario, culture, pre–university education and higher education. An account of the higher education system of Libya before and after independence is discussed in Section 2.5 , this is followed by a description of quality management issues of higher education (Section 2.6) and an analysis of the challenges facing the system (Section 2.7 Section 2.8 summarises the chapter.

2.2 Higher Education in the Arab World

Higher education in the Arab world is characterised by a low enrolment of students when compared to other regions of the world (Fergany, 2000) (Figure 2.1). Another feature is the low enrolment of female students (Figure 2.2).

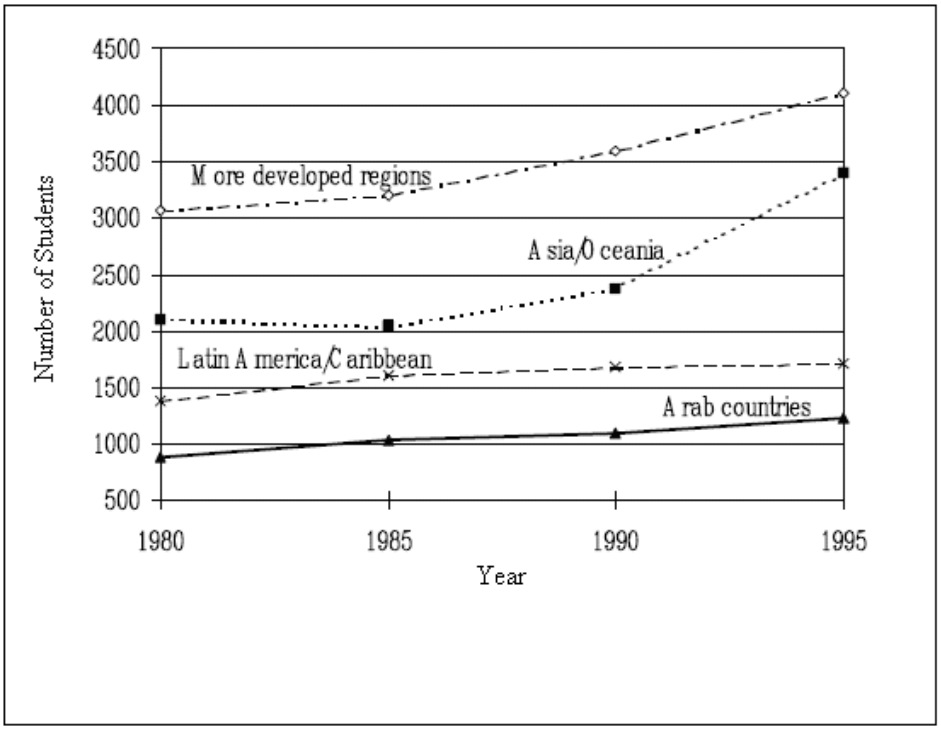

Figure 2.1: Number of higher education students per 100,000 inhabitants (Fergany, 2000)

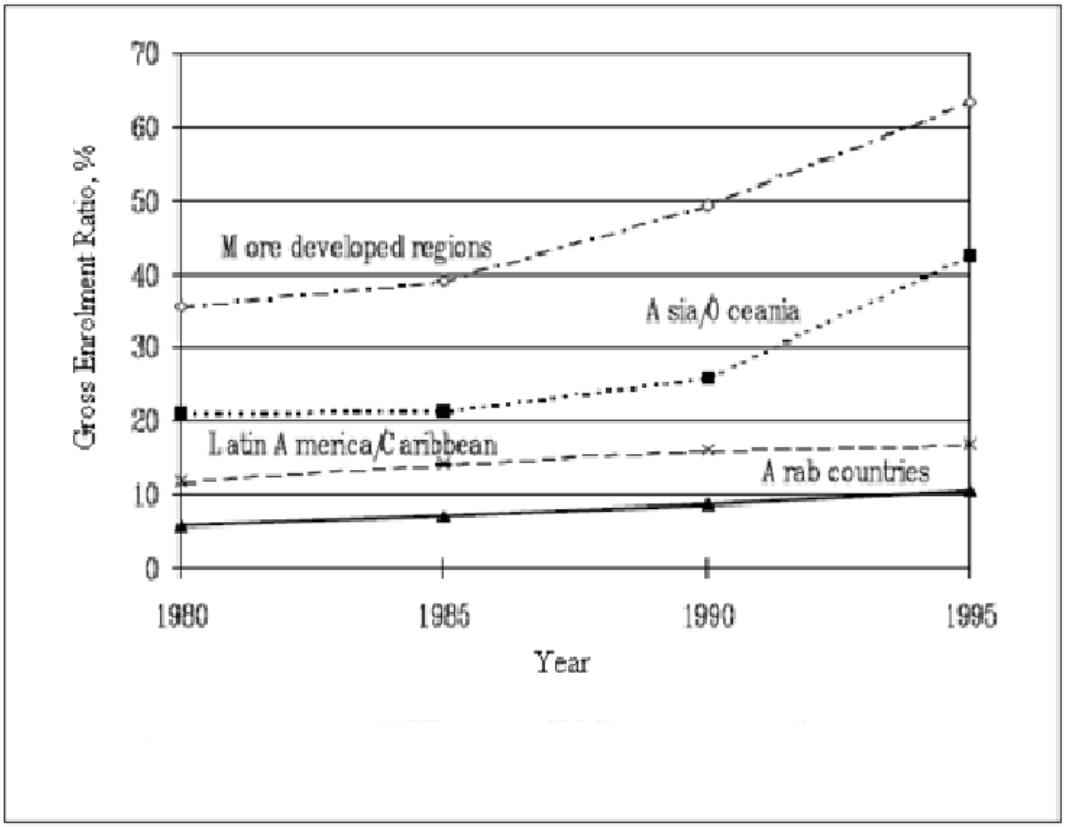

Figure 2.2: Gross Enrolment Ratio of Female Students in Higher Education

(Fergany, 2000)

A lack of data and information on higher education is more prominent in the area of quality in the Arab world, although the number of universities has grown from ten at the time of World War II to 132 at the beginning of this century. The fact that half of these universities were founded only after 1980 raises serious doubts about the quality of education in this region. Below is an overview of higher education issues in Arab states (UNDP, 2005):

1. The aims of many programs are insufficiently clear.
2. Little use of external reference in curriculum development.
3. Faculty staff finds a little time for research.
4. University assessments lack challenge and depth.
5. Individual written feedback is a rarity.
6. Lack of audit in student marking and potentials for unfairness.
7. Project work is strength in the region.
8. Attrition is high in about 50 percent of the universities in this sample

9. Need for value-added programs for higher achieving students.
10. Need for more systematic collection and analysis of data on student progression, achievement, and employment.
11. Good practice in teaching, learning and assessment needs to be shared within universities
12. Library resources are usually weak. New libraries continue to be built, but this will not address prevalent book and journal stock problems.
13. Number and type of personal computers are adequate; however, their organisation needs attention in several cases.
14. The provision of software is generally appropriate to student needs.
15. The use of networks, the Internet, and local Intranets is at best adequate. Universities are not currently taking full advantage of these networks as educational platforms and resources.
16. While many universities operate procedures, which address aspects of quality assurance, few can be said to manage quality in a unified, systematic, and fully documented manner that includes all aspects of university life.

In 2007, the Association of Arab Universities and the Arab Quality Assurance and Accreditation Network agreed to establish a permanent neutral forum for the classification of Arab higher education institutions (AARU, 2007). To date, Jordan is the only Arab state that has established a body concerned with accreditation of higher education (UNESCO, 2009) and the Trans-European Mobility Program for University Studies (TEMPUS) has a branch in Lebanon which has initiated an accreditation program for engineering colleges.

2.3 Historic Background of Libya

Evidence shows that coastal Libya was occupied by the Berbers during the Neolithic or New Stone Age period (8000 BC) when the humans had developed to the extent of using tools made of stone, farming wild crops and keeping sheep and goats (Bellwood, 2004). In the same period in the Sahara Desert of southern Libya, nomadic hunters and herders occupied pastures and reared domestic animals (FRD, 1987). After 2000 B.C., due to desertification and invasions, these communities migrated towards the north and were absorbed within the Berber community. Until now, the origin of the Berber community is not well established although evidence suggests that large numbers of

Berbers have migrated as far as Scandinavia. Berbers present a broad range of physical types and speak a variety of mutually unintelligible dialects that belong to the Afro-Asiatic family (FRD, 2005).

In the later periods leading up to the Fifth Century BC, the Berbers were either colonised or conquered by the Phoenicians, Greeks and Romans (Herodotus, 430 BC) (FRD, 1987). The three regions of ancient Libya – Oea, Leptis Magna, and Sabratha were united by the Romans, and the name of the present capital city–Tripoli (implying three cities) were derived based on this unification.

In 655, King AIqba Ibn Nafi conquered Libya and brought it under Islamic rule. Following this, the Islamic rule continued under other kings. The Ottoman Turks conquered Libya in the 16th century and ruled it until the Italy – Turkish War in 1911 and soon after the Italian forces colonised all the three regions of Libya simultaneously.

2.3.1 The Sansui Movement

The Sanusi religious movement of Cyrenaica region of Libya formed a resistance system to the Italian colonial regime (FRD, 1987). A prominent leader of this movement – Omar Mokhtar, originally a Quran teacher, organised many battles against the Italian forces (Wright, 1981). Although the unified resistance to the Italian forces gained momentum initially, the Italian forces over – powered and destroyed Sanusi religious and educational centres during the 1930s. It is noted that such historic events have a profound impact on the education of future generations.

After the World War II, the allied British and French forces occupied the Italian colony of Libya. During this period, the United Nations General Assembly passed a resolution affirming that Libya should gain its independence before January 1, 1952 (FRD, 2005). Libya declared its independence as a constitutional, hereditary monarchy under King Idris on December 24, 1951, thus becoming the first country to gain its independence through the UN. Following this, major oil reserves were discovered in Libya in 1959, transforming it into a wealthy country.

2.3.2 The 1969 Revolution

On September 1, 1969, a military action took place, and the leader of this action - Muammar Al-Qadhafi, declared the new Libyan Arab Republic. Libya's new regime was being governed by the Revolutionary Command Council under the leadership of Al-Qadhafi. The Al-Qadhafi regime created new political structures and made a

determined effort at economic development financed by oil revenues (FRD, 2005). It is noted that oil revenues played a major role in Libya's educational reforms.

2.3.3 Economic Sanctions

In the 1980s, Libya witnessed antagonising situations with the West and its neighbours over terrorism and defence related matters. As a result, the UK and the USA governments severed all relationships with Libya, the USA being the largest importer of crude oil from Libya, imposed trade sanctions.

2.3.4 Isolation and Economic Decline

The 1990s were years of political and economic isolation for Libya. The sanctions and trade embargoes brought about rising import costs and inflation in Libya's domestic economy, affecting the life of its citizens. As a result, Libya's higher education was considerably affected.

2.3.5 Lifting of Sanctions

During the period 1999–2003, the Libyan government fulfilled all the terms of the UN Security Council that were required to lift the sanctions. In 2004, the United States lifted all trade, commercial, and travel sanctions against Libya and fresh relationships were established with the UK (FRD, 2005).

2.4 Country Profile

In 2013, Libya had a total population of 6.2 million (World Bank, 2015) with an annual population growth of 0.8 percent for the same year (UNESCO, 2014). Berbers and Arabs constituted 97% of the population. The remaining 3% included Greeks, Maltese, Italians, Egyptians, Pakistanis, Turks, Indians, and Tunisians (CIA, 2008). Libya had a population growth rate of 1.54% between 2005 and 2010 (United Nations, 2012). Although overall population density is about three per square kilometre, ninety percent of the people live in less than ten percent of the land; primarily along the coast that covers a distance of 1800 kilometres (FRD, 2005; Youssef, 2006). More than half the population is urban, mostly concentrated in the two largest cities - Tripoli and Benghazi. This has led to an increase in the number of educational institutions in these cities.

2.4.1 Religion

Ninety-seven percent of Libyans follow the faith of Sunni Islam and the rest follow various other religions (Checkpoint, 2006). The government controls most mosques and

Islamic institutions, and even mosques endowed by prominent families generally remain within the government-approved interpretation of Islam.

There are small Christian communities, composed almost exclusively of foreigners, predominantly African immigrants (USDS, 2004). Members of minority religions are allowed to conduct services. Christian churches operate openly, and the Government routinely grants visas and residence papers to religious staff from other nations (USDS, 2004).

The religion has influenced the education system historically, and most institutions teach subjects in Arabic language (Checkpoint, 2006).

2.4.2 Political System

Before the downfall of the Gaddafi regime, Libya had a political system known as the Jamahiriya meaning the "Republic of the Masses" (Youssef, 2006). Governing took place through a series of popular entities which function as local governments called “Basic People's Congresses” (BPCs). Each BPC chose a secretary to represent them in Libya's highest legislative organ, the General People's Congress (GPC). The GPC chose "Secretaries of the Secretariat” or Cabinet Ministers. These Secretaries from the cabinet called the General People's Committee, which is presided over by the Prime Minister.

The Libyan government has implemented extensive and popular welfare programmes by substantially subsidising water, power, housing, medical and education requirements of its population. In 1992, as part of its decentralisation drive, the government identified 1500 communes with their own budget and legislative and executive powers. Also, in 2000 most government executive functions excluding defence, trade, social security, health, education, and infrastructure were transferred to 26 municipal councils represented in the GPC.

Since the demise of the Gaddafi regime in 2011 Libya was under a transitional government, and in 2012 the General National Congress elected a prime minister who elected an interim government, however, because of fighting between rival factions the government collapsed in 2014 (BBC, 2015). At present, there is no resemblance of government. Thus, the government structure in terms of executive functions is difficult to determine.

2.4.3 Socio – Economic Scenario

In 2013, Libya had a GDP per capita of $17,534 with an annual GDP growth of 2.1 percent (UNESCO, 2014).

Gaddafi's Green Book advocated an ideology for economic development and suggested it as an alternative to Capitalism and Marxism (Youssef, 2006). It is derived based on socialist principles in combination with Arab nationalism and Islam. Accordingly, at that time the state controlled the economy, and the private sector had only a minimal role.

Although the UN's Human Development Index, which ranks standard of living, social security, health care and other factors for development, placed Libya at the top of all African countries, Libya's economy was far weaker in the 1990's than it was in the early 1980's, due to the sanctions (Looklex, 2009). More recently, Libya, in 2013 still ranked the highest in Africa for human development where it ranked 55 globally (UNDP, 2014).

2.4.4 Culture

Islam has a prominent position in defining the Libyan culture (NI, 2009). Of all of Libya's invaders, the Arabs have had the most enduring influence, and Islam took a prominent position in Libyan culture (NI, 2009). In this context, while defining the fundamental approach to its education system, the Libyan National Report on Education stresses the need to confirm and highlight the features of the Arab-Islamic identity and the privacy of the Libyan culture and the national memory of the Libyan people (GSPLAJ, 2004). A study conducted by Salem and Pitt (2008) indicated that cultural issues are significant in benchmarking of the manufacturing industries in Libya; it is noted that the sensitivity and behaviour of managers are more influenced by vivid descriptions rather than by statistical information on benchmarking.

Some of the core cultural values, which affect work environment in Libya, are the following (Abubaker, 2008):

1. Libyan culture is characterised by high power distance - a parameter that differentiates between individualism and collectivism; due to high power distance, individuals do not take part in collective activities quickly, in order to avoid uncertainties.

2. Muslims believe that God (Allah) is the greatest being and that He created them and arranged all their life affairs. Therefore, in conducting their business, Muslims believe that they have to do their best, and the success or failure is dependent on the will of God.

3. According to Islamic work ethics, hard work and respecting people in the place of work are considered virtues. Therefore, one needs to be attentive and careful in generating good relationships with colleagues and the peers. At times, this also leads to communication problems in decision-making processes.

4. All these aspects cause an average Libyan to focus intensively on his own hard work and worship of God in his day to day life; usually participation in other social or political activities are minimal.

5. Direct communication with the opposite sex in places of work and public places is a sensitive matter in Libya as it is the case with most Arab countries. This aspect has affected the learning process in higher education which depends on effective communication.

2.5 Education in Libya

Libyan school facilities and teaching methods are not regularly benchmarked against any international standard or any systems with other countries (Youssef, 2006). Furthermore, the strong links between research institutions and business, which are typically seen in developed countries, do not exist in the Libyan economy (UNESCO, 2011).

Literacy for those aged 15 and above in Libya has steadily increased from 60.2 percent in 1984 to 89.9 percent in 2012 (Figure 2.3), for those in secondary and tertiary education, between the ages of 15 and 24 literacy is much higher at 99.9 percent in 2012, increasing from 89.3 percent in 1984 (Figure 2.4) (UNESCO, 2014). Fortunately, females in secondary and tertiary education are on a par with males at 99.9 percent literacy in 2012; this is in contrast to 1984 where males had a literacy rate of 97.9 percent in comparison to females with only 80.3 percent for the same year (see Figure 2.4).

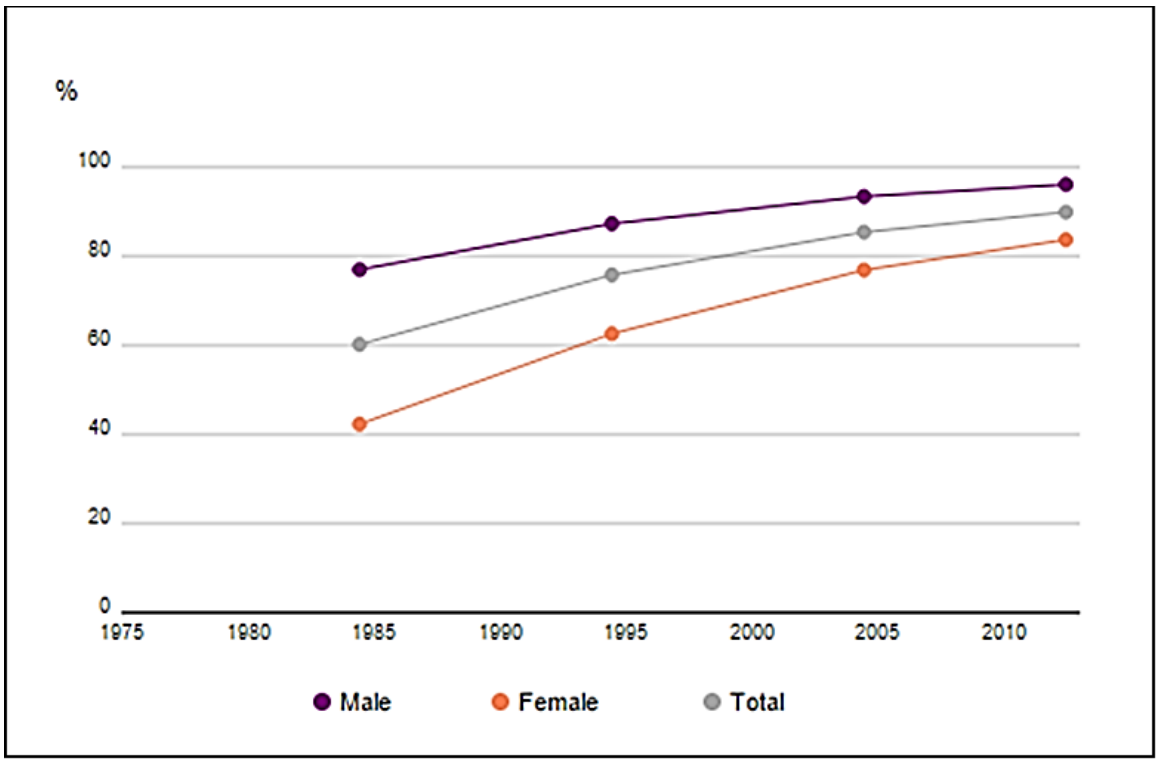

Figure 2.3: Literacy rate over time (UNESCO Institute for Statistics, 2014)

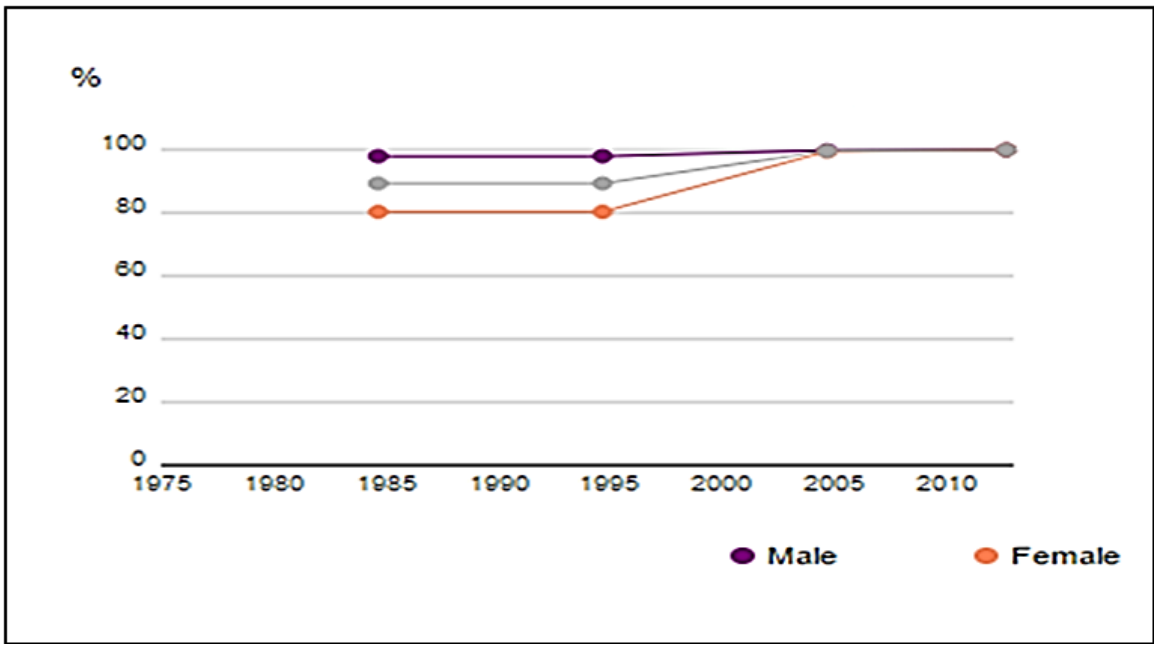

Figure 2.4: Literacy rate among the population aged 15-24 years. (UNESCO Institute for Statistics, 2014)

Libya's public expenditure on education was about 4% of GDP, which was approximately the average for the Middle East and North Africa (MENA) countries

(Youssef, 2006) and between 2006 and 2012 it decrease to 2.7 percent of GDP and Reported adult literacy levels are among the highest in the region at 84%; with youth literacy reaching 100% and female literacy considerably better than many MENA peers. However, there are very few institutions, which cater to the needs of industrial training. Libyan public companies have difficulty in identifying the training required for their employees, and most employees are not confident of doing their job professionally (Agnaia, 1996).

2.5.1 The Religious Schools

Until the Twentieth Century, the Ottoman Empire encouraged Quran schools in Libya (NI, 2009). Section 2.2 . The Quran schools were affiliated with mosques and taught children to read the Quran and write Arabic script. Higher order religious training was available through other institutes and students could also study law. During the period of King Idris, additional courses were offered in the subjects besides religion which included astronomy, science, geography, history, mathematics, and medicine.

In 1939, Libya had 418 Arab Quran schools and 93 Italian schools under the colonial regime. The Italian schools were meant for the exclusive education of Italian settlers. Although these schools had comparable standards to those in Rome, Libyans could not attend them (NI, 2009). In addition to these schools, there were sixteen Jewish schools and one Greek school. In general, it was observed that Libyan students graduated with a lower standard of education when compared to their counter - parts from the Italian schools.

2.5.2 Post–Independence Scenario

After independence, Libyan education was enhanced through improved textbooks and syllabi developed in the Arabic language. The government built many primary and secondary schools throughout Libya and reopened the Quran schools. With a strong religious element, Libyan education grew rapidly during this period and despite a shortage of teachers, female enrolments rose quickly; a vocational education stream was introduced and Libya's first university was inaugurated in 1955 at Benghazi. Total enrollment at the end of the colonial era was 34,000 and in 1962 it was increased over four times to 150,000; eventually just before the revolution, in 1969 enrolment had

increased to 360,000 students. Open cases, tents and mobile and prefabricated classrooms were used during this period to meet ever-increasing enrollment. In 1986, 1.2 million students or almost one-third of the Libyan population was enrolled in school or in some other form of educational endeavour. Between 1970 and 1986, Libya built 32,000 new classrooms for primary, secondary, and vocational schools. During the same period, the number of teachers rose from 19,000 to 79,000. Unfortunately, this rise in the number of teachers was not met with an increase in the quality of teaching and the quality of education suffered (NI, 2009). A plot of the trends in enrollment and number of teachers shown in Figure 2.5 depicts exponential trends over time and that the system grew at a faster rate, particularly after the 1970s. In addition, the widening gap between the curves depicting enrollment and number of teachers leads to the further conclusion that the teacher - student ratio was also increasing steadily during this period, supporting the argument that there were fewer teachers per number of students.

The Libyan education story depicts a national education system that was restarted almost from scratch in 1951 (NI, 2009). It suggests that most people of the previous generation had little chance to get educated and that the parents' literacy, as a historical factor, affected their children's education (Escudero and Marchionni, Undated). Despite these limitations, in 2005 Libya recorded a remarkable literacy level of 84% (UNDP, 2008). The major contributing factor for this achievement was its oil revenues, which rose substantially from the year 1959 (Yahia, 2008).

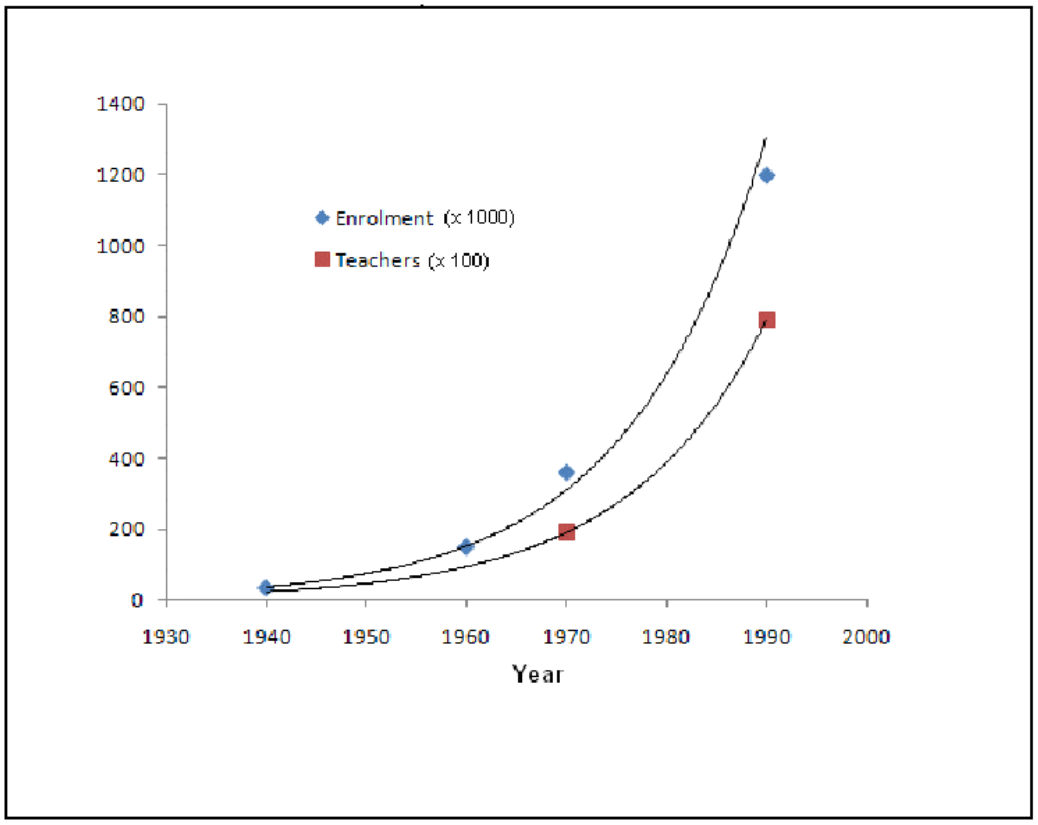

Figure 2.5: Student enrollment and number of teachers in Libyan pre–university education (NI, 2009)

2.5.3 Pre-University Education

Pre-university education is primarily divided into two sections: primary and secondary (Checkpoint, 2006). The first nine years of education are compulsory which consists of six years of primary and three years of secondary school. The six years of primary school is divided into a four-year period followed by a two-year period. The secondary education covers six to seven years divided into a three-year compulsory schooling followed by and a three to four-year intermediate term. Students who drop out before completing are allowed to enrol in vocational programs of one to three years' duration. Vocational training offers skills-based programmes for 44 vocations covered by seven major fields.

Recently the government has signed a Memorandum of Understanding (MOU) with One Laptop per Child (OLPC) - a non-profit organisation in the United States, towards

supplying one laptop computer to each of its 1.2 million schoolchildren (Checkpoint, 2006).

2.5.4 Higher Education in Libya

Ever since the first College of Arts and Education was founded in 1955 in the city of Benghazi, the higher education scenario in Libya witnessed considerable growth. In 1999, there were 14 universities, which grew to 27 by the year 2005.

The Global Competitiveness Report ranks Libya 113 globally and 103 for higher education (World Bank, 2013). Between 2012 -2013 in the North African region Libya ranks 2nd for higher education and training with a score of 3.6 after Botswana with a score of 3.7, the average for the region was 3.46 (1 = not well at all; 7 = very well) (World Bank, 2013).

The enrolment in higher education has increased from 13000 in 1975 to 270 000 in 2003. In 1995, there were 188000 students among Libya's population of 5.9 million which works out that there were 3186 students per 100000 inhabitants. This figure is not only above the rest of the Arab world but also comparable with the enrolment in the developed world (Fergany, 2000). For the period 2003 to 2012, 61% of people of tertiary education age were enrolled in higher education (UNDP, 2014). Similar trends are also noted for the case of female enrolment shown in Table 2.2.

Table 2.1: Student Enrolment in Libyan Universities: (INHEA, 2015).

Year	No. of Students in Universities	No. of Students in Higher Technical Institutes	Total
1975-76	13,418	-	13,418
1980-81	19,315	1,130	20,445
1984-85	32,770	3,080	35,850
1989-90	50,475	3,916	54,391
1992-93	101,093	12,921	114,014
1993-94	116,473	16,912	133,385
1995-96	160,000	28,106	188,106
1996-97	160,112	54,080	214,192
1997-98	168,123	58,512	226,635
1998-99	165,447	58,877	224,324
1999-00	204,332	64,970	269,302

Table 2.2: Female Students in Libyan Universities: (INHEA, 2015).

Year	Number of Students		Total	Percent Female
	Male	Female		
1980-81	15,259	4,056	19,315	21
1991-92	40,094	32,805	72,899	45
1992-93	52,568	48,525	101,093	48
1993-94	64,069	52,413	116,473	45
1995-96	66,775	60,499	136,274	51
1996-97	90,112	70,000	160,112	51
1998-99	81,807	83,640	162,447	51

Moreover, the gross enrolment ratio for tertiary education in Libya is the highest for all the African countries (seeFigure 2.6).

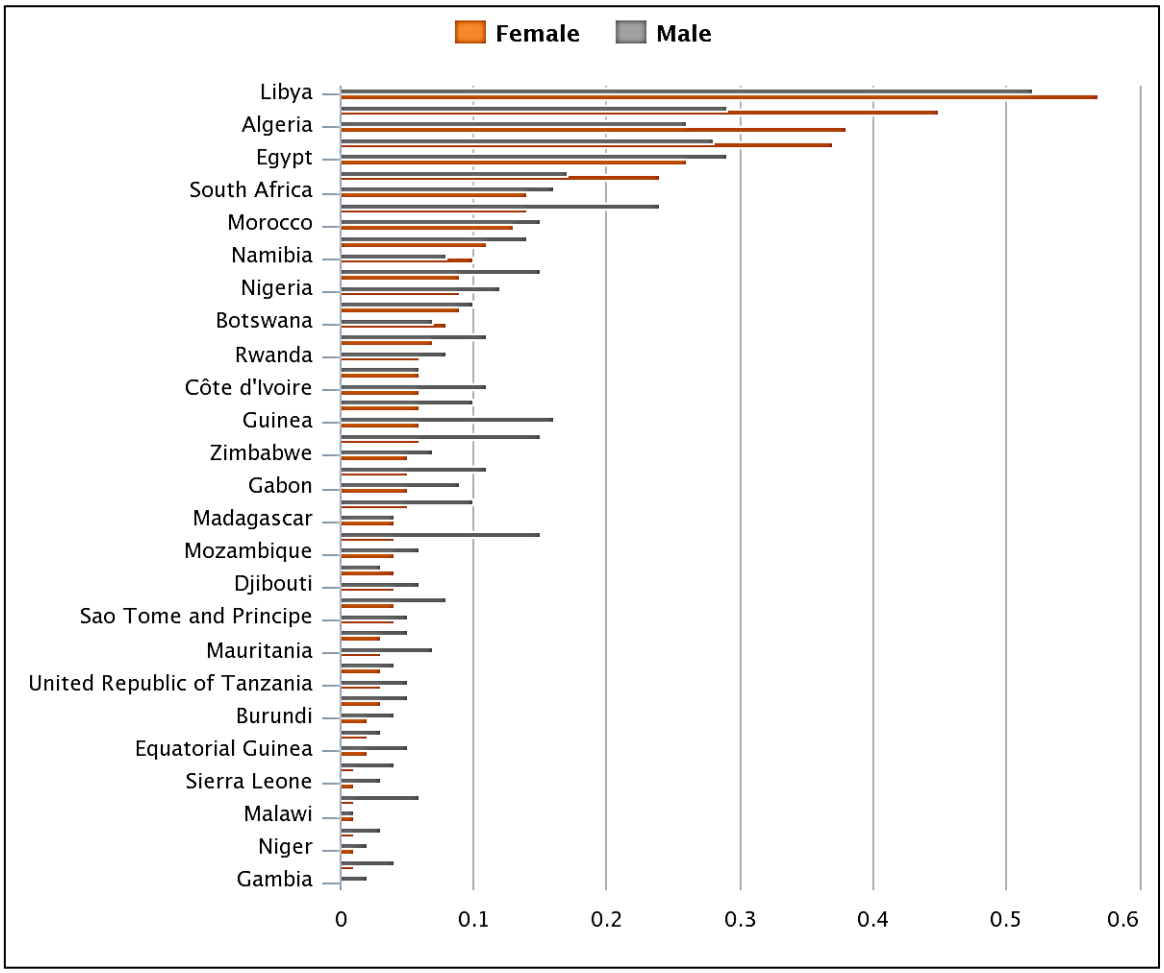

Figure 2.6: Gross enrolment ratio in tertiary education, by sex for African countries (INHEA, 2015)

From Table 2.2 it is clear that female enrolment exceeds male enrolment in tertiary education in Libya, this trend continued and in 2003 where the ratio of female enrolment was 0.57 and the ratio for males was 0.52 (see Figure 2.7).

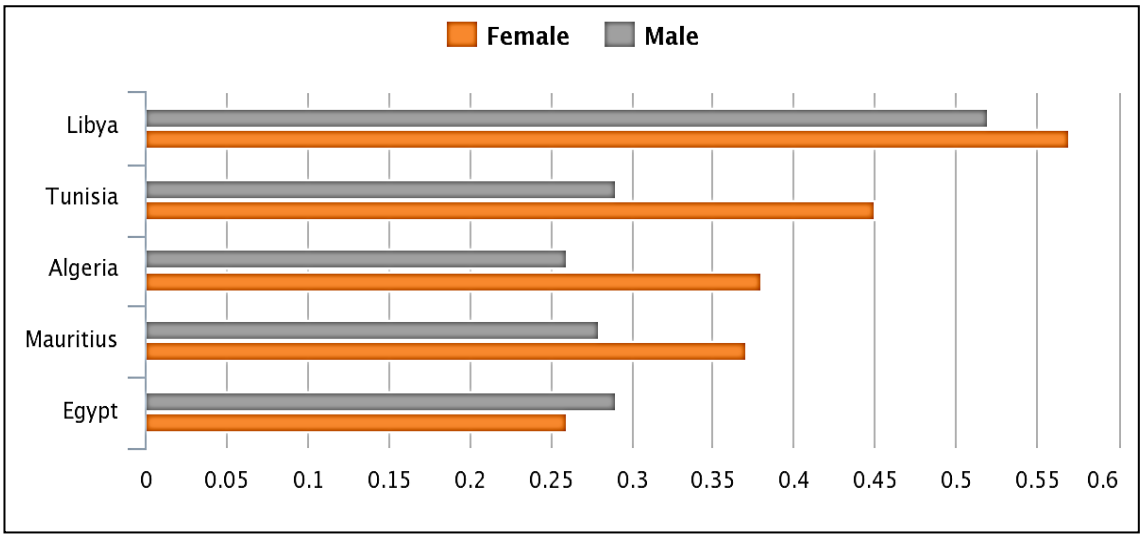

Figure 2.7: Gross enrolment ratio in tertiary education, by sex (INHEA, 2015)

Libya has a history of sending university students abroad. In 1978, more than 3,000 students were studying in the United States alone, however, by 2002 that figure had dropped to just 33 because of sanctions imposed. Officials from the British Council estimate that there are currently more than 3000 Libyan students enrolled at British institutions of higher and further education. Of those, 90 percent are said to be on Libyan government scholarships.

Higher education in Libya includes three major categories:

- University education, lasting four to seven years
- University vocational and technical education, lasting three to five years
- Advanced graduate studies

Higher education institutes have undergone many developments during the 1990s. These include administrative and organisational changes, the establishment of new scientific departments and faculties (UNESCO, 2004). University education includes a wide range of fields of study, such as basic sciences, humanities, languages and literature, engineering, industrial, medical, and agricultural sciences, economics and commerce, environmental studies, Islamic studies, and studies of international civilisation. The number of students has increased from 19,315 in 1981 to 279,150 in 2007. It is projected that this number will reach half a million by 2025 (NRGLJ, 2008).

Some success in the expansion of the education system has prompted the Libyan government to view the concept of education in a broader perspective involving the following objectives:

1. Continuing the dissemination of education for all.
2. Building human capacity for all segments of the population as is the case in the developed world.
3. Linking education needs and expectations to all segments of society.
4. Further development of the specialised secondary education system with amendments.

A more detailed official statement on the objectives of Libyan education. In summary, these statements lay emphasis on retaining Arab cultural values and the Arabic language as a medium of instruction. These objectives have been pursued through measures such as the introduction of new specialisations, continuation of free education, e – learning, structural modifications in examinations, exchange of international experience and career advancement for university faculty staff. In this context, while implementing an Information and Communication Technology (ICT) project for Education, Hamdy (2007) noted enablers and limiting factors (or barriers) given in Table 2.3.

Table 2.3: Enablers and limiting factors pertaining to ICT education project in Libya (Hamdy, 2007)

Aspect	Enablers	Limiting Factors
Policy framework	Policy framework was launched successfully	Collaboration of all government entities, the private sector, and the donor community is needed to be achieved
Advocacy and Leadership	The Libyan leadership and the Ministry of Education are fully committed	Constraints imposed the sanctions
Collaboration	The UNDP / UNESCO has mechanisms with the government and work in tandem	Existing ICT infrastructure
Human Resources	Investment	Lack of qualified personnel
Rural – Urban divide	Concept of mobile schools in remote areas	Some parts of the country in the Sahara are hard to reach
Gender issues	Commitment from leadership. Recently schools have enrolled more female students than male students	
Learning material	Support for the national policy objectives	Quality of education material requires enhancement
Sustainability	End of sanctions is in favour of sustainability of the programs.	

Libya has recently allowed the establishment of private institutions of higher education through what are known as educational co-operatives. In addition, the possibility of developing partnerships between the public and private sectors to finance higher education is being explored.

More recently, after the removal of Gaddafi rebuilding and improving higher education is now taking place. Although the country is in a transitional phase politically, both the interim transnational leadership and the General National Congress which followed are committed to developing the country's education system. This is hoped will resolve the country's unemployment problem, at 30 percent, through developing the human resource (Clark, 2013).

2.6 Quality and Sustainability Issues in Libyan Higher Education System

The literature presented above indicates that education in Libya has quality issues to be resolved. Problems are associated with the quality of inputs, such as curricula, teachers,

educational infrastructure, and a number of structural issues. These include the lack of reliable and objective standards, planning and monitoring, allocation and lack of resources (CERA, 2005). Quality management of higher education generally in the Arab world is facing many challenges (Fergany, 2000). Low enrolment of students, gender issues, and lack of credible data and late arrival of corrective programmes are some of the issues requiring further attention. Although Libya reflects the Arab world in many aspects concerning higher education, the recent advancements in enrolment are remarkable (INHEA, 2015).

The United Nations Human Development Index, which ranks standard of living, social security, health care and other factors for development, places Libya at the top of all African countries (INHEA, 2015). Additionally, Libya also displayed the highest literacy rate in the Arab world with education being free to everyone from elementary school right up to university at home or abroad, yet, Post-Graduate study may involve some expenses (Hamdy, 2007) for example the cost of a master's degree course at the Academy of Postgraduate Studies in Tripoli, Libya may cost up to USD $2,300 for three years. The Open University is the only institution within the public sector that relies to some extent on tuition fees paid by students, but the fees are much lower when compared to the fees in the open universities of developed nations. For example, an undergraduate degree in the Open University of Libya costs about $1808 compared to $ 5960 for a similar programme in the UK.

While the low cost of education can be attributed to the steady increase of enrolment in Libyan universities, much has still to be accomplished on the quality front (T.A. Rafik*, n.d). Between 2012 and 2013 the quality of primary education in Libya was ranked at 134 globally and for the overall quality of the educational system it ranked 142 In reference to the quality of primary education, Libya ranks 134 globally (World Bank, 2013).

The Libyan government considered decentralisation for education improvement and in March 2000, the GPC for Education and Vocational Training dissolved and its responsibilities were transferred to the regional people's committees. However, between 2012 and 2013 the picture for the extent of educational staff training in Libya was poor, where the country ranked 140 globally In reference to the quality of primary education, Libya ranks 134 globally (World Bank, 2013).

As an example of a quality issue in Libya, a major problem facing Libya's engineering education is the quality of its graduates and the lack of conformity of their number and training with the requirements of social and economic development the labour market (T.A. Rafik*, n.d). The national human resource in Libya is relatively small and this influences the supply of a skilled labour force and economic progress was dependent upon the continued employment of foreign technical manpower to fill in the skills gaps.

In contrast to the engineering education situation, the Libyan medical education was considered much superior to other Arab countries in the 1970s to the mid-1980s (Daw and Elkhammas, 2008). It is noted that this system waned in due course because it could not sustain the same standard of physician training found in Britain. In addition, leadership in the medical schools and hospitals is considered as another issue that has an influence on the quality of medical education. In this scenario, parallel hypotheses can be drawn on the discussion on leadership and sustainability and some core values of TQM.

Finally, an issue from a broader perspective of quality and sustainability in higher education is the impact on Libya's environment. It is noted that the growth in population can exert pressure on the fragile Libyan environment that is characterised by a world - record for the hottest maximum temperature (58 °C), dusty winds from the Sahara desert and vulnerable and rapidly depleting water resources (Tantawi, 2005).

2.7 Higher Education: Some Challenges for the Future

During the period of 1990 – 2007 a higher rate of enrolment was recorded in Libyan higher education (Figure 2.8). Data on education flow rates in the year 1995 revealed that the secondary education sector reported an admission rate of 99 percent but the universities have attained an enrolment rate of only 14 percent; this indicates that fewer students opt for the university education after completing school (GSPLAJ, 2004). This also points to the fact that the Libyan achievement in literacy does not imply that its higher education output is correspondingly proportional. Therefore, the challenge is to increase university enrolment.

In 2010, 1.78 million people in Libya were under the age of 15 and 1.17 million were between 15 and 24 years (United Nations, 2012) a group that is eligible to enrol in some form of higher education. Given a birth rate of 27.2 and a death rate of 3.5 per thousand

respectively, the age group that would seek higher education in the future will increase dramatically. A graph showing the projected population distribution indicates that the higher education system will have to meet the challenge of 15% increase in enrolment in the near future.

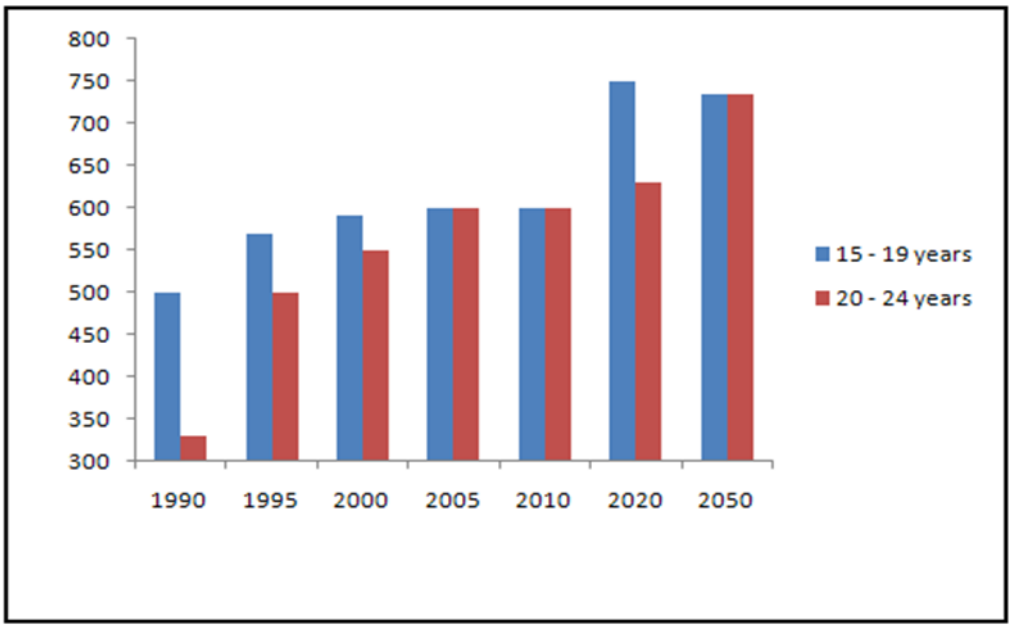

Figure 2.8: Age distribution of youth in Libya (USCB, 2008)

With the above trends in demographics, data projected in Figure 2.9 shows that the enrolment in Libyan universities will almost double its size in the year 2025 (considering the year 2000 as the baseline). Given that the current system is faced with innumerable difficulties even with half the size projected, the enormity of the task ahead can be considered as one of the greatest challenges facing the GPC in higher education history.

Part of the transitional government's response to improving higher education has been to seek help from abroad. There is a need to change the education system away from one that is based on political loyalty, ideology and patronage and this can only be achieved through collaboration with international partners, an example of which is an agreements signed in 2013 between TVET UK, an organisation dedicated to exporting the capabilities of the education sector, and the Libyan Board of Technical and Vocational Education (NBTVE) in order to facilitate partnerships between the two countries (Clark, 2013).

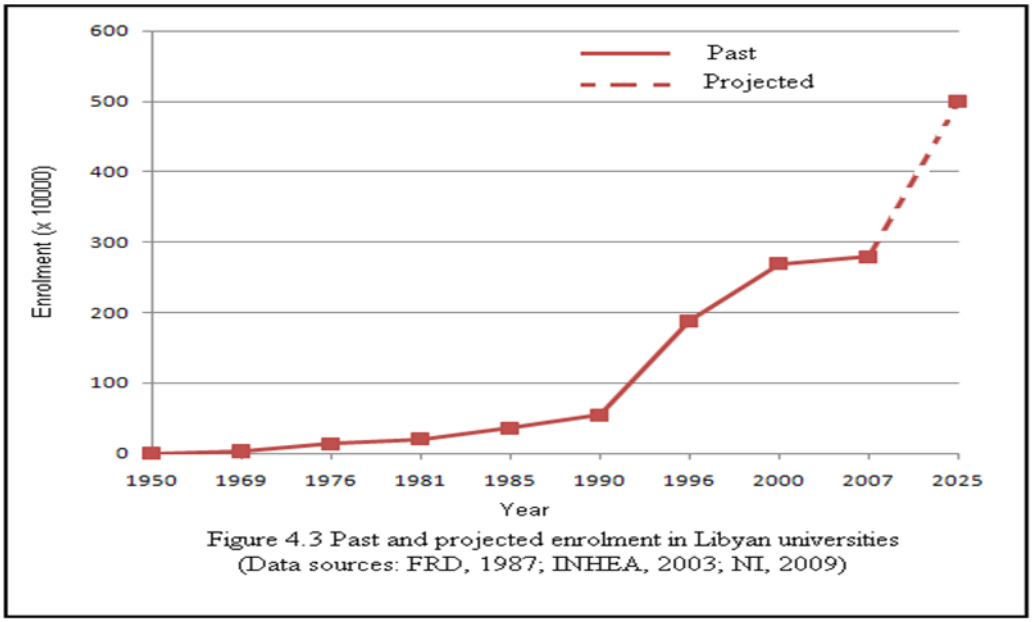

Figure 4.3 Past and projected enrolment in Libyan universities
(Data sources: FRD, 1987; INHEA, 2003; NI, 2009)

Figure 2.9: The Past and projected student enrolment in Libyan higher education (Fergany, 2000; GSPLAJ, 2004; USCB, 2008)

2.8 Summary

This chapter began with a brief overview of Libyan history and the influence of past and present governments on its education system. Unlike the rest of the Arab world, Libya has made significant progress in student enrolment in recent years. At present, a lack of data hampers the measurement of quality of higher education, which calls for further research in this area. A quality management ethos is suitable for Libyan higher education provided the country's unique cultural and social fabric is carefully woven into these quality management systems.

The fragile education system of Libya was subject to external influences which affected its quality and sustainability. An analysis of the secondary data on Libyan enrolment revealed that pre – religious schools dominated independent education, and during the post-independence periods the enrolment rose remarkably which was attributed to the oil economy. Libya also posts a higher enrolment ratio when compared to the rest of the Arab nations. A positive aspect of the Libyan system is the free higher education, but its quality is disputable, for example, the Libyan medical education, held in high regard by other Arab nations until the 1980s, waned slowly. Therefore, SQM in Libyan higher education is a crucial step forward.

An analysis of the flow rates showed that fewer students opt for university education after completing school and that achievement in literacy does not imply that its higher education output is correspondingly proportional. Age distribution of Libyan youth appears to be a major concern for the Libyan higher education system and it faces a historic challenge to double enrolment by 2025.

Overall, there was a call for SQM approaches of Libyan universities campuses, through holistic and future-oriented approaches. The next Chapter explain how these approaches were considered in the research design of this study.

Chapter 3 Research Methodology

3.1 Introduction

Research is defined as a systematic investigation to find answers to a problem (Burns, 2000). According to Saunders (2003), the term "methodology" refers to:

'How research should be undertaken, including the theoretical and philosophical assumptions upon which research is based and the implications of these for the method or methods adopted'. Saunders (2003) and Kumar et al. (1999) suggested that research objectives can be met by thinking and critically examining the various aspects of a subject area; this requires understanding and formulating guiding principles that govern the subject area and developing new paradigms for further enhancements. It also considers formulated research questions based on objectives and literature review, a comprehensive research design, tools and techniques used towards finding answers to research questions, data collection and analysis methods, and finally, reliability and validity of the chosen methods are all important elements of research methodology (Knight, 2008). This chapter presents a detailed description of these aspects of the present research study.

In the previous chapters' aspects pertaining to the literature about SQM followed by the relevance of its application in the Libyan HE context was discussed. These included interfaces between the TQM models (Deming PDSA and EFQM) and sustainability principles, descriptions on strong and weak sustainability derived from the Triple Bottom Line and Five Capitals approaches, the importance of ethical and cultural issues in a Libyan context, and finally, how all these issues are linked in the higher education sector. Based on these aspects the research questions and methodology for this study were formulated and are explained in this chapter in detail. The methods used in this study range from simple empirical tests to advanced statistical analysis; the choice of particular approaches generally depended on the rigour required for meeting a particular aspect of the study and the nature of data available or collected from various sources. For example, a simple rank frequency analysis was done for the group average scores of the questionnaire responses but for analysing significant differences at the QAP level the Kruskal Wallis Mean Ranks and Mann Whitney Mean Ranks tests were adopted using SPSS computer software.

The importance of this chapter can be realised from the fact that unlike the manufacturing and industrial sectors, quality and sustainability initiatives are relatively new to the higher education sector (section 4.5.2). It was observed that the business-oriented approaches embedded in quality management required some modifications to conform to the measurement of higher education quality, and more importantly, its sustainability (Srikanthan and Dalrymple, 2002). In this context, this research focused on exploratory approaches applicable to the Libyan HE system; these included literature search on TQM models (PDSA and EFQM) and sustainability models (TBL and FCM), pilot status studies based on ontological and epistemological perspectives, theoretical gap analysis in the Libyan Higher Education system, developing a questionnaire design based on two pilot studies and adoption of semi – structured interviews that provided more freedom to the participants towards exploration. Broadly, four stages of data collection were involved in this study including preliminary surveys at the case study universities, exploration of available secondary data relating to them, semi – structured interviews at all levels of the Libyan Higher Education System and primary data collection through the distribution of a questionnaire to the relevant parties of the Libyan Higher Education System.

In section 3.2 and 3.3 of this chapter the research objectives and research questions of the study are presented. Solutions to these research questions are presented in the research design in Section 3.4 and the theoretical and philosophical considerations involved in various analyses and inferences of the study are presented in Section3.5 . Following this, a discussion on quantitative and qualitative methods and how they are combined using triangulation approaches is presented in3.6 , 3.7 and 3.8 respectively. A detailed account of various aspects of the questionnaire design and implementation is presented in Section 3.9 followed by a description of the data collected through the questionnaire and semi – structured interviews in Section3.10 . Reliability, validity, and limitations of the questionnaire data are discussed in Section 3.11 . In Section 3.12 and 3.13 the rationale and procedures used for the statistical methods for analysing the quantitative data are discussed. Section3.14 summarises this chapter.

3.2 Research objectives

The research objectives presented in Section 1.3 are repeated here so that they can be viewed in conjunction with the research questions presented in the section that follows.

The main aim of this study is to develop and evaluate a framework for SQM in the Libyan HE sector and the specific objectives are as follows:

1. To explore and evaluate how sustainability is addressed in key quality management models (Deming PDSA and EFQM).
2. To identify and examine Critical Success Factors (CSFs) as defined in the Deming PDSA and EFQM literature; based on this Quality Action Programs (QAPs) will be evaluated at sub – criteria level of the CSFs identified.
3. To analyse the outcomes of objective (1) and (2) above towards identifying Critical Success Factors (CSFs) of SQM as main criteria and Quality Action Programs (QAPs) a sub-criterion of SQM.
4. To carry out two university-based case studies for examining the validity of these CSFs and QAPs.
5. To develop a framework for SQM in Libyan HE sectors and evaluate this framework through semi – structured interviews at the case study locations.

3.3 Research Questions

The purpose of this study is to explore and develop a SQM framework for higher education based on Deming PDSA and EFQM models. With this general aim the research questions were specified by combining the objectives of the study with the outcomes of the literature survey and the theoretical gap analysis, presented in chapters 3, 4 and 5 respectively. Specific research questions are:

1. What are the Critical Success Factors (CSFs), as main criteria, and Quality Action Programs (QAPs), as sub – criteria, for achieving Sustainable Quality Management in (SQM) in Higher Education?
2. How are sustainability issues linked to Deming PDSA and EFQM models?
3. How are the (CSFs) and (QAPs) implemented in Libyan Higher Education Institutions and what gaps are visible at various levels of the Libyan HE system?
4. What are the perceptions of Libyan HE stakeholders about the present level of implementation of the SQM and QAPs identified? Are there other issues to be considered and implemented towards enhancing and sustaining quality?

5. What elements are included in a (SQM) framework model that can contribute to enhancing sustaining quality in the Libyan Higher Education system?

The research design presented in Section 0focuses on how these questions will be addressed through the various strategies, tools and techniques listed in Figure 3.1. The links between Figure 3.1and these research questions are presented in Table 3.1 .

3.4 Research Design

The plan, structure and strategy of a research program, aimed at answering specific questions were presented in a research design (Kerlinger and Lee, 2000). A schematic of the overall research design for this study is presented in Figure 3.1. Prior to the commencement of the main data collection activities, pilot surveys were conducted at Libyan universities to evaluate the level of understanding and clarity of the questions related to SQM topics; this is followed an exploratory analysis of links between PDSA and EFQM models. By combining these data with the first semi – structured interview, a gap analysis at various levels of Libyan Higher Education System was conducted.

Table 3.1: Links between aspects of the research design (Figure 3.1**;**Figure 3.2**) and research questions**

Research Question	**Links to elements illustrated in Figure 3.1 and 3.2**
1. What are the Critical Success Factors (CSFs), as main criteria, and Quality Action Programs (QAPs), as sub – criteria, for achieving Sustainable Quality Management in (SQM) in Higher Education?	Preliminary status survey 1 & 2, literature survey and exploratory semi – structured interviews with Libyan experts.
2. How are sustainability issues linked to Deming PDSA and EFQM models?	Literature survey analysis based on PDSA and EFQM models and Five Capital Model and Triple Bottom Line approaches.
3. How are the (CSFs) and (QAPs) implemented in Libyan Higher Education Institutions and what types of gaps are visible at various levels of the Libyan HE system?	Theoretical gap analysis based on TQM models and Sustainability principles; semi- structured interviews conducted with Libyan Higher Education experts.
4. What are the perceptions of Libyan internal stakeholders within HE about the present level of implementation of the SQM QAPs identified? Are there other issues to be considered and implemented towards enhancing and sustaining quality?	Statistical analysis of final questionnaire survey and Sustainability Index Model evaluation; analysis of semi- structured interviews with Libyan higher education experts
5. What elements are included in a SQM framework model that can contribute to enhancing sustainability and quality in the Libyan Higher Education system?	Combined quantitative and qualitative findings analysis through data and methodological triangulation.

Broadly, it can be seen from Figure 3.1 that the study followed four streams of exploration: (1) Pilot surveys (2) Quantitative data collected through a questionnaire (3) Analytical Sustainability Index Model and (4) Qualitative data collected through semi – structured interviews. A convergence of these streams was accomplished through the data and methodological triangulation approaches discussed in Section 3.8

The study progressed from general to more focused themes over a timeframe as depicted in Figure 3.2. It can be seen from this figure that the initial steps of the study include the beta questionnaires distributed to Libyan Higher Education staff members to get feedback on their understanding of sustainability and quality. Theoretical analysis and design criteria analysis were carried out during the mid–phase of the study. During the final phase of the study more specific aspects of the study, including data analysis of the questionnaire and combine these results with those of the semi – structured

interview was conducted. An important milestone in this progression was the PDSA and EFQM link analysis at sub–criteria level that facilitated a more specific design framework. Strategies for the questionnaire and semi - structured interviews and questionnaire design evolved from these steps.

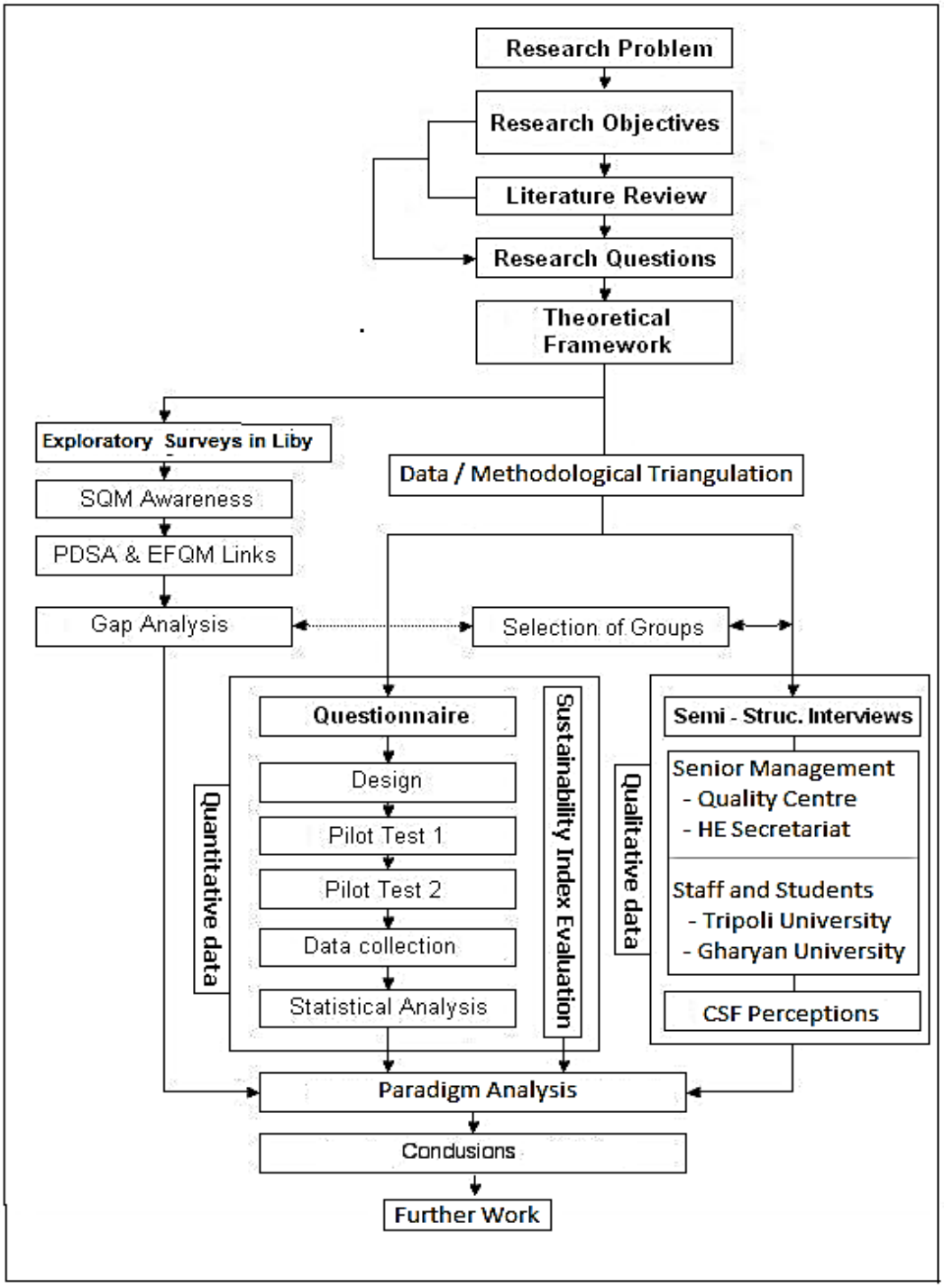

Figure 3.1: Schematic representation of the research design of the study

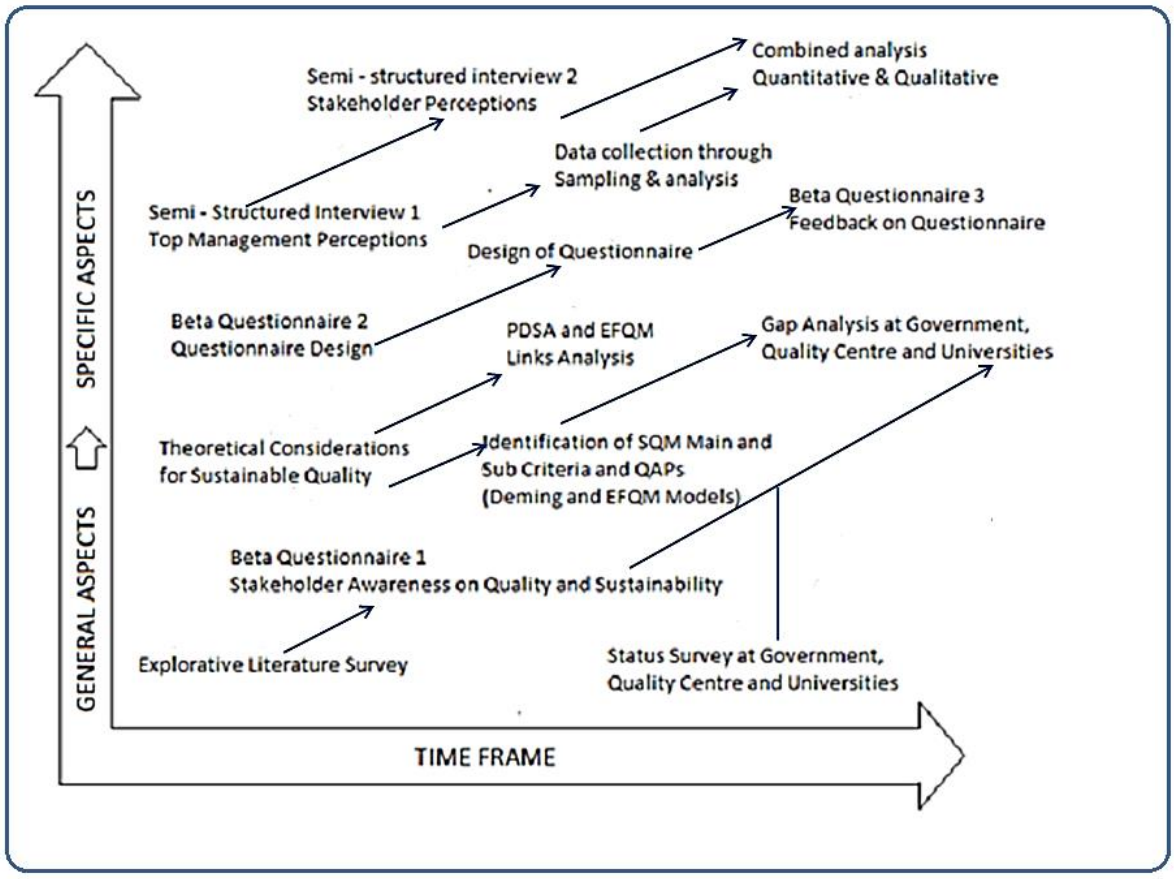

Figure 3.2: A Schematic showing how the elements of the research design progressed in timeframe from general aspects to specific aspects

3.5 Theoretical and Philosophical Considerations

The way of thinking adopted by the researcher towards the development of knowledge is based on the adopted research philosophy (Saunders, 2007). The philosophical approach to a research method relates to its assumptions in expressing the real world situation; reality, reason, truth, nature of knowledge, and proof of knowledge are some of the elements of the research philosophy (Hughes, 1997).

Ontological principles focus on the existence or being of the things under consideration according to our view of the world. This is based on the assumption that to investigate something means it has existed before the investigation started, and therefore, the fundamental questions of 'what existed' and 'in what modes it existed' are investigated. This is also followed by the knowledge of the object and its relationship to external and

internal properties. Epistemology distinguishes 'propositional knowledge' which is different from knowledge gained by knowing how to do things or by an acquaintance (Grbich, 2012). This implies that certain beliefs among people that exist as 'propositional knowledge' may or may not be true and that is realised only after an actual experience. For example, a person may initially believe that the building is strong and this was proved true until the building collapsed after some period of time. Therefore, the knowledge based on the belief of the responses from people is subjective and could deviate from the truth and needs to be viewed in the epistemological perspective.

The preliminary surveys conducted at the Libyan universities and other quality related government organisations were approached in the perspectives of ontology and epistemology due to the explorative nature of the present study. Positivist and phenomenological approaches have dominant positions in various schools of management research (Collis and Hussey, 2013). In the positivist approach, the researcher stands objectively at a distance while observing the phenomenon identified. Removal of idiosyncrasies of an observed phenomenon is predominant in the positivist approach. According to Stiles (2003), this aspect is considered important for data reliability. A questionnaire approach followed by data collection, aggregation of parameters and statistical hypothesis testing are well-adopted subjects within the domain of positivism (Stiles, 2003). According to Collis and Hussey (2013), five important features of positivism are:

1. It is deductive approaches that require testing theories based on observations.
2. Generally, relationships between variables are explained
3. It is depicted by frequent use of quantitative data
4. It allows room for aggregation of parameters and testing statistical hypothesis
5. It facilitates methods which can be replicated in the field

On the other hand, the phenomenological approach relies on the fact that through people understanding, a social world is created (Louis, 1991). Therefore, in contrast to the positivist approach, it depends mainly on a subjective understanding of the information available. With this information, the researcher evaluates the environment of the

information gathered and tries to gain an understanding of the phenomenon investigated. In this context, the phenomenological approaches tend to favour qualitative data collection methods (Stiles, 2003).

In summary, it can be inferred from Table 3.2 that while objective approaches and statistical probability characterise positivism, subjective approaches and theoretical abstraction are considered important in phenomenology. In the present study, both positivist and phenomenological approaches were used. The positivist approach was used for drawing inferences from the questionnaire (Section 3.9 However, the gap analysis presented in chapter 4 and the information collected through semi – structured interviews is primarily based on the phenomenological approach (Section3.10 3.10).

Table 3.2: Comparison of Positivist and Phenomenological Thinking (Twaissi, 2008)

	Positivism	Phenomenology
The observer	Must be independent	Is part of what is being observed
Human interests	Should be irrelevant	Are the main drivers of science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation
Research progress through	Hypotheses and deductions	Gathering rich data from which ideas are induced
Concepts	Need to be operationalised so that they can be measured	Should incorporate stakeholder perspectives
Unit of analysis	Should be reduced to simplest terms	May include the complexity of whole situations
Generalisation through	Statistical probability	Theoretical abstraction
Sampling requires	Large number selected randomly	Small number of cases chosen for specific reasons

3.6 Quantitative Methods

Quantitative methods deal with the numerical representation of observations and analysis for the purpose of describing a phenomenon (Babbie and Halley, 1995).

Generally this method requires data collected in the form of numbers which are subjected to statistical analysis. The data collected usually represents a large population that is controlled through specified sampling methods. Some characteristics of quantitative research methods are the ability to predict based on theoretical considerations, increased objectivity of the researcher and statistical reliability of the results and effective translation of results by quantification (Dillman, 2000).

Quantitative methods used in this study can be grouped into two categories:

1. Methods which correspond to ontological and epistemological perspectives (Section3.6 : These methods are primarily focused on existence type questions such as 'is there quality and sustainability related awareness in Libyan higher education institutions?' To clarify the questions, two pilot questionnaires were distributed to a limited number of staff members (Appendix B).

2. Methods which correspond to positivist approaches (Section 3.5): These methods focused on how the beliefs of the stakeholders are related to the actual reality of SQM status in the Libyan higher education system. A detailed questionnaire was developed on the basis of pilot tests and analysed using non – parametric tests valuation using the Sustainability Index Model (SIM) is also included and is reported in section 3.13 .

A more detailed description of questionnaire design, samples and data collected, pilot tests and analysis, and statistical parameters evaluated are presented in Sections 3.8 to 3.12 and methods and procedures followed for SIM analysis are presented in this chapter.

3.7 Qualitative Methods

Past studies have observed that the most valuable information can be obtained from a relatively small group of people or individuals who have specialised knowledge in the topic under research. According to Corbin and Strauss (1990), any research that is not an outcome of statistical procedures or other means of quantification can be included in qualitative methods. Features of qualitative research can be summarised as follows (Strauss and Corbin, 1990):

1) Some areas of interest of the study are deduced from information gathered from the subject specialists although the researcher has not previously identified them;

2) Data is mainly collected by the researcher and it can include words, pictures, or objects.

3) Conclusions are verifiable through analysis of different sources of information.

Qualitative survey samples were based on purposive sampling (Miles et al., 2013). They enabled the researcher to gather more reliable information based on the previous experience and expertise of those in the top and middle management positions at the Libyan Education Quality Assurance and Accreditation Centre and secretarial staff at the Ministry of Education in the Libyan government. As discussed in Section 3.5 of this chapter, phenomenological approaches were considered appropriate for interpreting the information gathered through the semi – structured interviews with this sample.

3.8 Triangulation of Quantitative and Qualitative Data

The diverse approaches discussed in previous Sections 3.5 and 3.7 can be subject to a combined analysis in order to maximise the value of the data collected (Twaissi, 2008). According to Mangan et al. (2004), quantitative and qualitative data are connected through the research paradigms Positivism and Phenomenology discussed in Section 3.5 Some deviant samples collected as part of a quantitative data set may not provide an adequate explanation for certain specific issues. Such inadequacies of the quantitative method can, in part, be addressed by the explanations gathered through qualitative methods (Jones, 1997; Twaissi, 2008).

Triangulation is a research strategy that can be used to combine two or more techniques adopted in a study which can be utilised to develop a holistic approach towards a problem (Bryman, 2003; Hoque, 2006). The term triangulation is comparable to the technique used in land surveys wherein different surveyors view the same site from different angles to measure various parameters. In management research triangulation is generally adopted to overcome the weaknesses encountered by using a single method. Four types of triangulation are as follows (Collis and Hussey, 2013):

i. **Data triangulation**: In this method data collected from many sources such as primary and secondary sources are triangulated. In addition, it also facilitates to triangulate data collected at different times.

ii. **Investigator triangulation**: When different researchers collect data independently about the same phenomenon.

iii. **Methodological Triangulation**: When different methods of data collection are involved (for example quantitative and qualitative).

iv. **Theoretical Triangulation:** When a theory grounded in one discipline to explain a phenomenon can be used to help explain another phenomenon in another discipline.

In this study two types of triangulation were adopted. Firstly, data triangulation was undertaken through an analysis of interrelationships between various types of data collected. These include questionnaire responses received from academic staff and students of the two universities selected and non – academic staff at the National Quality Centre and Higher Education secretariat and semi – structured interview responses. Secondly methodological triangulation was applied to study links between the quantitative and qualitative data collected; this included the results of pilot survey responses, non-parametric statistics of the main questionnaire survey, the results of the sustainability Index Model and information gathered through semi–structured interviews.

3.9 Design of the Questionnaire

The questionnaire used in the present study was designed based on principles and approaches described in PDSA, EFQM and sustainable development models. The background theoretical analysis for the development of the questionnaire is presented in chapter 4 in the gap analysis and Appendix I, in which various links to the sub – criteria of these models are presented. Before distribution of the questionnaire, two pilot tests were conducted on aspects relating to format, scale, content, and clarity of the questionnaire (Section3.9.2).

Content, clarity of the language used, the order of questions, and length of questions are some of the important criteria for designing a questionnaire (Janes, 1999). A poorly designed questionnaire can tend to increase non-sampling errors (Robson, 2002). Characteristics of a well-designed questionnaire are clarity and specificity of the questions, understand ability, and ease of responding, the motivation of the respondent and authenticity and reliability.

The content of the questions chosen for the study was limited to the seven Critical Success. Factors (CSF) see Section 4.9 ; Table 4.5. Questions were organised under the heading of each CSF. The first page of the questionnaire concerned the general information about the respondent.

The respondent should fill the questionnaire independently and freely; therefore, it requires avoiding questions which are threatening in nature and those that affect the privacy of the respondents. In this context, the De-Montfort University' policy requires filling with an ethical approval form that seeks that the voluntary consent of the respondents participating in the questionnaire will be acquired (Appendix G). This procedure was followed in the present research.

3.9.1 The Questionnaire Survey

According to Collis and Hussey (2013), a questionnaire is a list of carefully structured questions which are distributed after testing in order to get meaningful responses from the sample. This method is considered efficient and most widely used because the researcher can replicate the information collected and administer data collection in a number of ways such as personal, postal or internet (Collis and Hussey, 2013). There are other advantages of using a questionnaire such as cheaper costs, the anonymity of the responses and absence of bias of the interviewer in the interviewing method.

3.9.2 Thematic Aspects for the Questionnaire Design

Initially, key literature collected for this study was classified and subject to a content analysis under various CSFs considered for the study. A more detailed account of these is presented in Section 2.5 . Thematic areas considered for the study were also derived

from expert opinions obtained through the semi–structured interview responses (Section 6.3).

3.9.3 Questionnaire Piloting

It is recommended that a questionnaire is tested several times before distributing to respondents so that it can address the research objectives effectively (Sekaran and Bougie, 1992). Pilot testing carried out before circulation of a questionnaire is considered as good practice for the evaluation of its clarity, presentation and format. This process should also ensure that the questions are understood by the respondents and weaknesses in language, structure and format, ambiguity and answering difficulties are resolved. Collis and Hussey (2013) reported that it is useful to test the questionnaire through a small group of respondents before the actual process of distribution. In this study two such pilot tests were conducted, the first during the process of questionnaire design and the second after completion of questionnaire preparation.

Pilot Test 1: Format and scale of the questionnaire

Four types of the format were chosen for the study, which depicts a combination of two formats of question expressions with Likert scales 5 and 10 (Appendix B). In these combinations, two types of wordings were used, the first with simple and common words for ease of understanding and the second with complex phrases and more detailed expressions. These questionnaires were circulated to 20 respondents asking for their opinion on the preference of a given format and confidence in scoring using a given scale. Based on this feedback the questionnaire was designed and prepared in Format 4 (Appendix C).

Pilot Test 2: Content and Clarity of the questionnaire

The prepared questionnaire was sent to 40 respondents (including various stakeholders and experts) in higher education for the purpose of testing content and clarity. The feedback revealed the improvements which can be made in the following aspects:

1. Originally the questionnaire was designed in MS Excel so that the responses can be automatically compiled under each Critical Success Factor (CSF) heading using a specifically written computer program (a screen capture sample of this is presented in Appendix D). Many respondents expressed their difficulty in either using the MS Excel program or did not have the skills or the

software to score on the Likert scale provided. Hence, the questionnaire structure was changed to MS Word format, (Appendix E).

2. Elaborating or shortening of questions

3. Rephrasing complex statements

4. Simplification of words that were not understood

3.9.4 Cover Letter and Consent Form

A cover letter which accompanied the questionnaire is presented in Appendix F. This explained the purpose of the questionnaire, how to enter the responses, the research nature of the survey and confidentiality statements. It also requested the participants to answer the questionnaire based on their own and unbiased experience in their respective institutions. The cover letter was appended with a "General Information Sheet" that sought certain general particulars of the respondent.

In addition to these a “Consent form” was sent to the respondent seeking their consent to participate in the survey. A statutory format of the Ethical Committee of De Montfort University was followed by the consent form (Appendix G).

3.10 Data Collection

The study involved the collection of both primary and secondary data. The questionnaire and semi - structured interviews discussed in these sections 3.9 and 3.10 pertain to primary data. The secondary data included the literature search and the collection of reports from the National Higher Education Quality Centre and the Higher Education Secretariat at the Education Ministry in Tripoli. While the former enabled the researcher to gain insight into the present research problem to higher education, the latter was used for compilation of data related to the background on the higher education system of Libya presented in chapter 3 of this dissertation.

A number of methods were considered to be relevant to the Libyan context. For primary data collection with a view to enhancing the response rate (Youssef, 2006). In addition, a combination of methods was used to increase the response rate when compared to anyone.

Single method. In this study, the researcher has employed methods including telephone, personal visit to the respondent, postal mail, and email systems for collection of primary Data.

3.10.1 Sample Size for Questionnaire

Due to limited financial resources and time constraints the researcher was unable to include all universities and higher educational institutions of Libya. Hence a non-probabilistic sampling method was followed that included two universities and two non–academic HE institutions. Under this method convenience sampling was adopted for the two universities and two non – academic Higher Education institutions. However, random sampling was adopted for choosing respondents within these institutions. The sample institutions selected for the study are found within the Libyan higher education system and included, the Higher Education Secretariat at the Ministry of Education, LEQAAC, Tripoli University and Gharyan University. It is noted here that Tripoli University is a national level university and Gharyan University is a regional university. This approach facilitated the collection of data that reflected both national and regional viewpoints of the respondents. The respondents of the study can be broadly classified into the following categories:

1. Ministerial and HE Secretariat staff of the Libyan Ministry of Education (LME).
2. Staff at the Libyan Education Quality Assurance and Accreditation Centre (LEQAAC)
3. Academic and research staff of the two universities selected
4. Administrative staff of the two universities selected
5. Students of the two universities selected (Table 3.3)

Table 3.3: Number of questionnaires distributed and responses received from various institutions in Libya

Organization	Number of questionnaires distributed	Number of responses received	Number of responses from staff members	Number of responses from students
Tripoli University	500	336 (67.2)	293	43
Gharyan University	500	292 (58.4)	241	51
LEQAAC	50	27 (54.0)	0	0
Secretariat	50	23 (46.0)	0	0
Total	1100	678 (61.6)	534	94

* Numbers in brackets are percent response

3.10.2 Questionnaire Distribution

The questionnaires were distributed to students and staff of the two universities during April and September 2012. The researcher personally explained the questions whenever respondents asked questions. During these interactions, it was observed that in general, the students were less capable of answering some complex questions on the subject (For example, the question involving the Triple Bottom Line (TBL)). In addition, less working hours, lack of quality management training among some sections of the staff and post – war situations were constraints faced during the questionnaire data collection. In all a total of 678 responses received amounted to 61.6 percent of 1100 questionnaires distributed (Table 3.3). A higher response rate was obtained from Tripoli University when compared to the Gharyan University this can be

Attributed to the fact that Tripoli University is a National University and has many collaborative activities at LEQAAC on higher education quality management.

3.10.3 Semi–Structured Interviews

Combining interviews with a questionnaire supplements with information that is generally not answered by any one of these methods (Creswell and Clark, 2007). A number of semi – structured interviews were conducted during this study; during the initial phase; these interviews focused on quality and sustainability awareness among the higher education staff. During the later phases, the interviews focused on the research questions listed in Section 5.3 An interview can be structured, semi – structured and unstructured (Saunders, 2003). For structured interviews, the researcher is aware of the kind of information to be gathered and a set of standard questions are prepared to this effect. Usually "what" and "how" questions dominate the structured interview rather than "why" questions because with the latter the answers can often deviate beyond the boundaries set for the structure of the interview. While the standard format answers collected can be considered as an advantage when a large number of structured interviews are conducted they often lack flexibility and may result in less useful information being collected to meet the research aims.

On the other hand, unstructured interviews are considered informal and the researcher does not plan the sequence or pre – determine the list of questions (Oppenheim, 2000). This kind of research, however, requires the researcher to have a clear idea of the various aspects of the topic under investigation. While the respondents can speak freely about various issues in this type of interview and this method is suited to exploratory pilot research that can bring preliminary insights and themes to the surface (Sekaran and Bougie, 1992). The inherent limitation of this method is that discussions may proceed uncontrollably to irrelevant topics leading to constraints in data analysis (Collis and Hussey, 2013).

Semi–structured interviews follow the middle path between structured and unstructured interviews. The interviewer plans a list of themes and sequence of questions but gives some leverage to the respondent in answering them. In addition to this, either the interviewer or the respondent have the opportunity to ask "why" questions to follow up on a response. This technique is generally applied in social sciences research and in subjects where understanding a particular phenomenon is considered more important than measuring it. In addition, this approach permits the interviewer to discuss a topic in

advance and has the flexibility for them to answer and clarify the issues raised while the interview is in progress.

This study involved the exploration of SQM topics and new required an understanding of new phenomena relating to quality management. While this aspect needed flexibility in interviewing it also required structuring according to the eight Critical Success Factors (CSF's) chosen for the study (Section 4.9 Based on these considerations a framework for semi – structured interviews was designed (Appendix H). Questions were to be asked of respondents in predetermined sequential order with and were linked to the themes presented in chapter 5. The questionnaire survey of this study was also combined with semi-structured interviews conducted with 31 interviewees, all of whom also answered the questionnaire. The reason for this can be considered in two perspectives. Firstly, a combined analysis has the potential to provide more insight into the subject matter as many experts in the field of Libyan HE participated in the interviews. Secondly, the researcher could identify additional thematic areas of SQM as a result of the semi – structured interviews.

3.10.4 Semi-Structured Interview Process of the Study

In the first phase of the research, 10 exploratory interviews were conducted with quality and sustainability management experts in Libyan Higher Education Institutions (LHEIs). In the second phase, 31 follow -up semi-structured interviews were conducted with selected respondents. The interviews were carried out in two phase (Table 3.4). In the first phase, appointments were arranged with the HEI leaders to provide a list of potential interviewees at different levels in LHEIs based on their qualification, experience, and knowledge in higher education sector related issues. In the second phase, LHEI colleagues of the researcher were interviewed. The sampling technique was 'target' and 'convenience sampling' respectively. Prior to an interview, as stipulated by the DMU guidelines on ethical issues, the interviewee's identity was assured to be safe guarded, and data confidentiality and right to withdraw, ensured. In the face to face interview, following the elicitation of general information of the participant, specific questions were asked on various issues relating to SQM and further comments recorded. During the interview, similar tone, voice, and wordings were used

so that the attention of the participant was not diverted. Tape recordings were made with participants' agreement; otherwise hand–written notes were taken.

Table 3.4: Libyan Higher Education Institutions Interviews Participants

Institutions	Number of Academic Staff responses	Number of Leaders responses	Number of Director responses	Total of participants in the interviews
Tripoli University	6	4	4	14
Gharyan University	5	2	4	11
Quality assurance Centre	0	1	2	3
Higher Education Secretariat	0	2	1	3
Total	11	9	11	31

3.11 Reliability and Validity of the Questionnaire Data

Reliability and validity of the questionnaire data collected were tested using the methods described in the following sections; this was undertaken with a particular emphasis on assessing whether the features of the questions depict the purpose of the research.

3.11.1 Reliability

The reliability of data collected depends on how far a given variable produces the same value for repeated measurements (Newman and McNeil, 1998). In the context of a questionnaire, this also implies how far the questions are related to each other. Hence, this procedure can support the exclusion of items (Seale, 1999). Three prominent methods of reliability tests are described below:

(a) Test-retest method: In this method, the same set of participants respond to a questionnaire at different times (Litwin, 1995). The data obtained is correlated to find if the responses are significantly different. Correlation coefficients are used for such comparisons.

(b) Alternate form method: This method either rephrase the questions or changes their order (Cooper and Schindler, 2013). And the different versions are distributed to the respondents at different times. Higher correlations indicate more reliability.

(c) Internal consistency method: Internal consistency is used to measure how two groups measure the same value in the Likert scale provided; this is done using the coefficient Cronbach's Alpha that reflects the homogeneity of scale. This coefficient ranges between zero and one. Higher values indicate better internal consistency and hence considered more reliable.

In the present study method (c) mentioned above was adopted; the Likert scale data obtained from 678 respondents was arranged according to the groups and input into SPSS software for Estimation of Cronbach's Alpha value.

The results are presented in Table 3.5. It is observed that all question items have scored Cronbach Alpha values higher than 0.7 and the overall Cronbach Alpha value is 0.94. This indicated an acceptable level of internal consistency of the data collected as a Cronbach's Alpha value of 0.7 or more is acceptable as a good indicator of reliability (Litwin, 1995).

Table 3.5: Cronbach's Alpha computed for question items under various CSF's

CSF	Number of Questions	Cronbach's Alpha
Leadership	9	0.776
Policy and strategy	15	0.809
Continuous improvement	11	0.774
People focus	17	0.881
Stakeholder approach	5	0.741
Process management	7	0.733
Training	3	0.744
Key results	5	0.779
All	72	0.940

3.11.2 Validity

The purpose of a validity test is to make sure that the questions are measuring the parameters intended to be measured (Aaker, 2011). This can be denoted by the extent to which respondents agree that the list of words used in various items of the questionnaire have the intended meaning. In general questionnaire validity is ensured through interviews with experts and researchers working in similar fields. In this study, the validity of the questionnaire was tested through interviews with experts in this field at

Tripoli and Gharyan Universities and at the Libyan Education Quality Accreditation and Assurance Centre.

3.11.3 Limitations of Data Collection

The different components of data collection for the study were carried out in phases over a period of three years starting in 2009. During the latter phases of the study the process was significantly affected by the Civil war in Libya that lasted over a year. During this period and until now all academic institutions were closed and some academic infrastructure damaged. This affected to some extent the data collection process in terms of delays in scheduled interviews and collection of questionnaire data and the potential safety of the researcher.

3.12 Statistical Analysis of Questionnaire Data

The questionnaire was designed using a Likert scale wherein the respondents would choose a value of one to five for each question. Generally, statistical data which can be obtained can be grouped into four categories (Vigderhous, 1977):

Nominal data: This type of data represents only the weakest level of measurement; Numerical representations of the other categories are generally absent.

Ordinal data: In this type of data is represented by orders or ranks of responses. However, measuring distances between the ranks are generally not possible.

Interval data: Generally, this is integer type data. Ordering and distance measurement are permissible in this type of data, but decimals and fractions between variables are not possible.

Ratio data: In this type of data ordering, distance measurement, decimals and fractions between variables are all possible.

Based on the nature of data mentioned above, two general types of statistical analysis can be employed in a research study, parametric or non–parametric. For applying the parametric tests, the following criteria need to be satisfied (Vigderhous, 1977):

1. The scale measured should be of interval data type or fractions permissible
2. The sample should be taken randomly from a normally distributed population
3. The variances are equal or homogeneous

4. Observations are independent of each other

The Likert scale data is generally considered as “ordinal data” and is distinguished from the other three types mentioned above. This is because in the present study the five-point scale ranged from “Strongly Disagree” (Valued 1) to “Strongly Agree” (Valued 5) and the distance between every two values cannot be considered as same. This heterogeneity in distance between two scale values arises due to two reasons; firstly, the explorative nature of the questions involved in the relatively new subject of SQM and secondly the low level of understanding of this subject by the Libyan respondents (Section 2.5). The characteristics of the interval data in terms of distance measurement and a fraction allows it to be tested through parametric tests that follow a normal distribution. To subject ordinal data such as the data collected through Likert scale requires examination of the data in terms of distance measurement. While mean and standard deviation which are based on normal distribution are considered inappropriate for ordinal scales, rank, median or range are considered appropriate (Vigderhous, 1977). In addition, frequencies, and chi – squared statistics can also be used; Kruskall – Wallis model can also be applied based on the ranks but not on the response means. However if the data collected is indicative of a continuous measure, then it can be considered as interval data (Clason and Dormody, 1994). Based on these considerations non–parametric statistics were applied for analysis of this study.

Non–parametric statistics is also concerned with the number of groups studied. As mentioned later, in Section 3.9 , five groups were involved in this study. To gain insights into all these groups' perceptions on SQM issues it was necessary to adopt a method that would differentiate the perceptions of different groups.

The non–parametric Kruskall – Wallis test allows for the estimation of significant differences between three or more groups was used to study significant differences among the five groups of respondents. In addition to this the non-parametric Mann-Whitney test was used to test the statistical variables based on converted ranks, across any two groups for testing significant differences in their opinion. These two tests were applied using the Statistical Package for the Social Sciences (SPSS) computer software.

3.13 Evaluation based on the Sustainability Index Model

The Sustainability Index Model (SI Model) presented in Section (4.3) is used in this study for evaluation of the data collected through the questionnaire pertaining to the two universities; the rationale for adopting this method was discussed in Section (4.3). This model enables a quantitative evaluation of Sustainability Index based on the Equations 5.1 and 5.2 given below (Kumar et al., 2004).

$$QAP = \frac{\sum_{m=1}^{m=M} Vm\ Wm}{10I \sum_{m=1}^{m=M} Zm} \quad (3\text{-}1)$$

Where: QAP is the sustainability index

$$SIO = \frac{\sum_{l=1}^{l=I} \sum_{m=1}^{m=M} Vm\ Wm}{10I \sum_{m=1}^{m=M} Zm} \quad (3\text{-}2)$$

Where: SIO is the sustainability index of the organisation

and

i Index of a QAP

m Index of a group involved in the study

Zm Ideal weight factor assigned to a group

Wm Revised normalized weight of the department

Vm Actual performance of QAP ‘i' in the group ‘m’

In this study, each of the universities is considered as an organization and the questionnaire data collected from these were evaluated using the SI Model. This method is distinguished from the statistical analysis procedure discussed in (Section 3.12); while the non–parametric statistics measure the difference in perceptions of various groups, the SI Model evaluates the core of sustainability using the awareness of participants about various SQM related issues (Section 4.3). Each question listed under a CSF is evaluated using the SI Model through the following procedures. Quality qualities procedures were automated for each question in a row in the MS Excel Software and a sample of this is presented in Appendix L

The procedure I: Creation of Group Consciousness Matrix (Section4.3):

1) Identification of departments D1, D2…. Dm which are involved in the quality interface of the university.

2) Estimation of weightings, Z1, Z2…. Zm to each of the m groups on a scale of 1 to 10. This is done based on average scores computed for a QAP. This implies that the department which is related to most important QAP would get a score of 10.

3) Identification of quality consciousness stages:

   a. Estimation of weightings, Y1, Y2 … YK to each stage of quality consciousness on a scale of 1 to 10.

   b. Estimation of and assignment of weights, Xmk, m =1, …, M; k = 1, …, K to each cell in the department-consciousness matrix on a scale of 1-5

Procedure 2: Computation of Weighted Quality Consciousness Level

1- Computation of each department's Normalized Quality Consciousness Weight (NQCW) is given in equation 5.3 below: Example presented for Procedures 1 and 2 in Appendix N

$$W_m = \frac{Z_m}{10Max\{Z_m\}} \sum_{k=1}^{k=K} X_{mk} Y_k \qquad (3\text{-}3)$$

Where: m=1, 2…..., M

2- Computation of each group's Quality Consciousness State Efficiency (QCSE) is given in Equation 5.4 below:

$$QCSE_m = \frac{1}{100} \sum_{k=1}^{k=K} X_{mk} Y_k \qquad (3\text{-}4)$$

Procedure 3: Creation of Index Matrix Table

1. Estimation and assigning weightings Ui, i = 1… I, for QAP on a scale of 1 to 5 based on its contribution.

2. Estimation and assigning weightings Vim for i = 1, …, I, m = 1, …, M on a scale of 0 to 5 such that each assigned weight accurately reflects the effectiveness and completeness with which the QAP in question has been applied.

Computation of Sustainability Index based on the equations 5.1 and 5.2. This matrix is highlighted in MS Excel worksheet Leadership as the example presented in Appendix M.

Procedure 4 Validation

Based on the Sustainability Index value the importance of each QAP is evaluated; these results are used further for methodological triangulation and draw further inferences for the study (Figure 3.1) (Section3.8). We used two different streams of analysis. One of them is non-parametric tests are statistical for questionnaire data, including Eight Critical Success Factors (CSFs), and the second one is Sustainability Index (SI) follows analytical procedure. We try to validate our hypothesis through two different approaches of analysis. So, this under methodological triangulation.

3.14 Summary

This chapter began with a recollection of the objectives of the study, which were used in conjunction with the outcomes of the literature review to outline the research questions. Based on these a comprehensive framework for the research design of this study was discussed. This exploratory study followed four approaches, including two quantitative approaches (subjecting questionnaire data to non–parametric statistics and analytical procedures), qualitative data analysis and a combined analysis of all the previous three domains of results in the next chapter various types of methods followed in the combined analysis through data and methodological triangulation are presented. Both statistical and analytical tools were used to achieve results of this study based on theoretical and philosophical considerations that included paradigms of ontology, epistemology, positivism, and phenomenology. A link analysis related sub – criteria factors from the PDSA, EFQM and Five Capital models to derive the core SQM framework adopted for this study. Initial pilot surveys of the study focused on SQM awareness and gaps between rhetoric and the reality of SQM at various levels of the Libyan higher education system. Based on these activities a detailed questionnaire was designed, developed and piloted focusing on eight CSFs divided into 72 QAPs. In addition, a framework for semi–structured interviews with the Libyan experts was developed. Data collection through these instruments was done in several phases, at two universities and other higher education quality related institutions under the Libyan government system over a period of two years. The quantitative data collected was

statistically tested for reliability using Cronbach Alpha and evaluated through non–parametric Kruskal Wallis and Mann Whitney tests for the significance of differences among various groups. In addition to these tests, the Sustainable Index Model was applied to the dataset for analytical evaluation of the order of importance of various Quality Action Programs and Critical Success Factors in Sustainable Quality Management. Through data and methodological triangulations, a combined analysis was performed and inferences were drawn on various research questions of the study. The next chapter provides a review of the literature on quality, TQM, sustainability and quality issues in higher education and other areas related to the proposed study.

Chapter 4 Sustainable Quality Management in Higher Education: An Explorative Literature Review

4.1 Introduction

Initial approaches to sustainability focused more on environment related issues (Hediger, 1999). It is noted from the literature that the quality – sustainability synergies are still evolving, particularly in the case of higher education (Svensson, 2004, Isaksson2004). There are many perspectives and definitions of quality, which are supported by philosophical frameworks developed in the past including Deming, Juran, and Crosby. Further developments on this subject lead to the evolution of Total Quality Management (TQM) that had a considerable impact on the world-wide industries as in section 4.2 . Constraints faced by many organisations revealed the impact of TQM sustainability on organisational performance (Lund and Thomsen, 1994).

Some of the challenges facing quality management in higher education are customer focus, measurement of quality and integrating externally imposed quality models within the internal framework of the university system(Holmes and McElwee, 1995). (José Tarí, 2006) Although the EFQM, ISO, and UNESCO based quality programs have been initiated, a universally acceptable quality model is yet to be reached (Guellali, 2008).

Section (4.2) of this Chapter presents a brief overview of quality management, its definitions and foundation philosophies. Deming PDSA and EFQM models are introduced in Section (4.3) and (4.4). Past application of these models in higher education is discussed in Section (4.7). The subject of sustainable development and the role of TBL and Five Capital models in defining organisational sustainability are presented in Section (4.8). Based on these aspects a description of SQM and its profile in higher education are discussed in Sections 4.8, 4.9 and Section (4.10) presents a summary of this review.

4.2 Quality Management

Shewhart (1931) constructed a significant advance in the definition of quality that differed from the common quality concept; he defined quality as meeting the requirements of products and services and not reflecting on luxury (Shewhart, 1931; Tervonen et al., 2008). Shewhart's work (1931) on statistical process control charts was

a significant milestone in quality management. Dick et al (2013) argue that quality management can be defined as a holistic management philosophy that focuses on the maintenance and continuous improvement of all the functions within an organisation, with the goal of meeting or exceeding the requirements of customers and other stakeholders.

During late 1940's and 1950's the shortage of civilian goods in the United States made the production a top priority. In the post-war scenario, Deming and Juran introduced statistical quality control techniques to the Japanese to aid them in their rebuilding efforts (Radford, 1997). These techniques incorporated analytical decision-making tools which allow one to observe when a process is working correctly, and when it is not; by observing variations in any process using the variance data of normal distribution, these techniques can determine whether a process is in control or out of control. In manufacturing facilities, these observations enabled continuous monitoring and introducing corrective measures for quality control. The Deming Prize became a primary motivating goal for a Japanese company aspiring to excellence.

Increased global competition in the 1970's and the appearance of higher-quality foreign products on the market led American consumers to consider their purchasing decisions more carefully (Fisher and Nair, 2009). This led to the introduction of Parameter Design - a framework for quality improvement that was developed by Genichi Taguchi, first introduced to the Bell Laboratories, USA in 1980 (Taguchi and Organization, 1986).

The 1980's were a period of remarkable change and growing awareness of quality by consumers, industry, and governments. Deming was one of the most influential individuals in the quality revolution and led the world and many U.S. companies such as Ford Motor Company, General Motors, and Proctor and Gamble towards new horizons. Soon after this saw the advent of the idea of Total Quality Management and was widely used by management consultants elsewhere in the world. A brief account of the philosophical frameworks of quality management which had a profound impact on humanity is presented in the following sub – sections

4.2.1 Deming's Philosophy.

Initially, Deming worked on statistical sampling techniques for the US government. However, Deming never defined or described quality precisely (Redmond et al., 2008).

His philosophy focused on bringing about improvements in quality by minimising uncertainty and variability in the way a service is delivered. According to Deming (1986), the variability in service is a major cause of poor quality while inconsistencies in service delivery annoy and frustrate customers; it also damages the reputation of organisations. Quality should be aimed at the needs of the customer, present, and future. Deming (1986) prescribes four-principles for transforming a service:

1. Appreciation for a system – a system is a set of functions or activities within an organisation that works together for the aim of the organisation.
2. The components of any system must work together if it is to be effective.
3. Management's job is to optimise the system. Management must have an aim, a purpose toward which the system continually strives.
4. An understanding of variation in the organisation.

Common causes of variation generally account for about 80 to 90 percent of the observed variation in a production process and the remaining 10 to 20 percent are the result of special causes. Deming (1986) suggests that management always works towards reducing variation. Shortly after World War II Deming was credited as an important contributor to Japanese quality improvement programs and the highest award for quality improvement in Japan is called the Deming prize. Sections 4.3 and 4.4 describe the Deming PDSA model and the application of Deming principles in higher education.

4.2.2 Juran's Philosophy

Like Deming, Juran believed that most quality problems are due to management, and not due to employees. In his view, quality means fitness for use, and he considered quality management as three basic processes (Juran, 1993): Quality planning, Quality control, and Quality improvement.

Juran sought to improve quality by working within the system familiar to managers. His programs were designed to fit into a company's current strategic business planning with minimal risk of rejection. He advocated that the distinction between chronic and sporadic problems be essential because there are two different approaches to handling

these problems. Chronic problems require the principle of "breakthrough" while sporadic ones require the principle of "control".

4.2.3 Crosby's Philosophy

Crosby defined quality as conformance to requirements (Crosby, 1995). His philosophy is embodied in what he calls the "Absolutes of Quality Management" and the "Basic Elements of Improvement": These suggest that:

1. Quality means conformance to requirements.
2. There is no such thing as the economics of quality; doing the job right the first time is always cheaper.
3. The only performance measurement is the cost of quality, which is the expense of non-conformance.
4. The only performance standard is "Zero Defects".

4.2.4 Total Quality Management

Total Quality Management (TQM) emphasises concepts including continuous improvement, customer focus, human resources management and process management (Isaksson2004; Shibani et al., 2012) TQM advocates a companywide approach in contrast to focusing on only on product quality (Zink, 2007). In the beginning, TQM was adopted in manufacturing companies and later spread to service sectors such as healthcare and banking. A typical TQM implementation requires an understanding of critical factors, which will help improving various processes involved in the organisation (Juran, 2003). However, TQM is the process of modifying the essential culture of an organisation and channelling it towards superior product or service quality (In'airat and Al-Kassem, 2014). Once TQM is introduced in an organisation it is required to stay for long–term realisation of the goals and this principle is referred as TQM sustainability (Juran, 2003). Therefore, TQM is considered as a management philosophy based on modern philosophies and basic management methods, innovative efforts and specialised technical skills in order to raise performance level and continuous improvement (Mohammed et al., 2016).

4.2.5 Taguchi's Parameter Design

Taguchi realised that the best opportunity to eliminate variation was during the design of a product and its manufacturing process. Consequently, he developed a strategy for quality engineering that can be used in both contexts through the following components:
System design: At the conceptual level the system design is developed based on creativity and innovation.
Parameter Design: Once the concept is established, the nominal values of the various dimensions and design parameters are set; Taguchi's insight was that the exact choice of values required is under-specified by the performance requirements of the system. In many circumstances, this allows the parameters to be chosen so as to minimize the effects on performance arising from variation in manufacture, environment, and cumulative damage.
Tolerance design: With a successful completion of parameter design, and an understanding of the effect that the various parameters have on performance, resources can be focused on reducing and controlling variation.

4.2.6 Six - Sigma

Six sigma refer to the capability of the process to deliver units within set specification limits. According to Sunder (2014), Six sigma is a powerful breakthrough business improvement strategy that enables companies to use simple and powerful statistical methods for achieving and sustaining operational excellence. The TQM era also witnessed Six Sigma – a business management strategy developed by the Motorola Company in 1987 that focuses on identifying and eliminating of defects or errors in business processes According to Hahn et al. (1999), the Six - Sigma model is very disciplined and effective in removing defects from products and its adoption has resulted in gains worth billions of dollars. According to this model, quality is a state in which value entitlement is realised for the customer and provider in every aspect of the business relationship. Harry (2003) and Rawson et al. (2016) argued that Six Sigma was focused on improving quality and reducing variation, which in turn reduce defects (3.4 defects per million opportunities) and save money.
The word Sigma in Six - Sigma refers to the notation used for standard deviation in statistical analysis. The term Six - Sigma depicts the relationship between six standard

deviations between the process mean and the nearest specification limit and defects that fail the system. Some components of the Six - Sigma method were found to overcome inadequacies of TQM (Pande et al., 2000).

4.2.7 International Organisation for Standardization ISO

The International Organisation for Standardization (ISO) is an independent body with 159 member countries that develops quality standards (Hoyle, 2009). The ISO series is an internationally recognised quality assurance and management system and which aims to give customers confidence in their suppliers by assuring them that they have in place management processes that deliver consistency (Youssef, 2006). In the 1990s, the ISO 9000 specifications forced many companies to improve the quality of their products and processes. During this period Quality Awards were also instituted by many countries although recently some of the Quality Awards have been replaced by "Business Excellence Awards"(Fisher and Nair, 2009). Qinde (2014) argues that the higher quality of educational administration is based on the ISO9000 group of standards which are composed of the following four processes:1) resource management, 2) product implementation, 3) quality measurement, analysis, and 4) improvement. The ISO 9001 standard is based on eight quality management principles: Customer Focus, Leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision making, and mutually beneficial supplier relationships (Anon., 2012). According to Manders et al. (2016) these principles are used in other quality management approaches such as TQM and EFQM to stimulate innovation.

4.2.8 Whole System Design

Complex problems and growing concerns for the environment have fuelled the demand for more innovative and sustainable products, services and systems (Levine and Mohr, 1998) Whole System Design (WSD) is one approach that aims to integrate social, economic and environmental phenomena into a comprehensive design solution.
A whole systems approach, takes account of the interrelatedness of both problems and solutions to help generate more sustainable designs (Blizzard and Klotz, 2012).

While the traditional designs focused on improvement, modification or re-design of individual parts that was leading to a kind of incremental innovation, the WSD aims at achieving optimised efficiency within a whole system through a whole step - change. According to Levine and Mohr (1998), a shift from traditional design towards WSD occurs when the technical system design (business process/ workflow and equipment) is complete enough to begin social system design (supporting roles, measures, and structures). One interesting but difficult principle advocated by WSD is Zero Impact that aims to leave the whole system unaffected or with little effect after implementation of the activities.

Recently some proposals of WSD applications in the car industry have been reported (Spowers, 2006).Tracing back the history of car manufacturing and the approaches successfully implemented by the Toyota company in Japan. Aaker (2011) notes that WSD's foundations can be attributed to lean manufacturing which aims to minimise waste. Interestingly, the lean manufacturing principles were derived by the Toyota engineers by combining Ford Company's workflow with Taylor's and Deming's quality management principles (Aaker, 2011). The Whole Systems Design (WSD) is an approach that offers designers the opportunity to holistically optimise solutions for social, environmental, and economic sustainability (Blizzard and Klotz, 2012).

The early definitions and principles of quality management presented above are also considered as sustainable development within organisations, and this is considered as a future-oriented concept (Zink, 2007). TQM has been proven to contribute to the economic performance, and it also contributes to sustainable development (Isaksson 2004). These observations and linkages between quality and sustainable development call for an understanding of sustainable development in the context of the present study (Section 4.7 ; Table 4.2 and Table 4.).

4.3 Deming PDSA Model

Deming's Plan-Do-Study-Act (PDSA) cycle is an approach that is designed to develop and maintain TQM and is based on the idea that TQM should not just be a fad but something that should be clearly defined and implemented (Karuppusami and Gandhinathan, 2006). However, this model is considered as a tool or method to implement the TQM practices for continuous improvement through all four phases (Plan- Do- Check- Act). It is a continuous cycle that leads to improvement and place the

organization closer to achieving its objectives (Mohammed et al., 2016). In recent years. Rawson et al. (2016) stressed that Deming advocated a systematic testing of our theory of knowledge or world views using the PDSA cycle. They believed that organisations could achieve valuable learning for the continual improvement of a process or product through the application of this cycle.

Based on the TQM Implementation Index (TQMII), Kumar et al. (2004) demonstrated that the Deming's Plan – Do – Study - Act (PDSA) model can be used for quantitative evaluation of TQM sustainability (Figure 4.1) (Kumar et al., 2004; BSI, 2010).

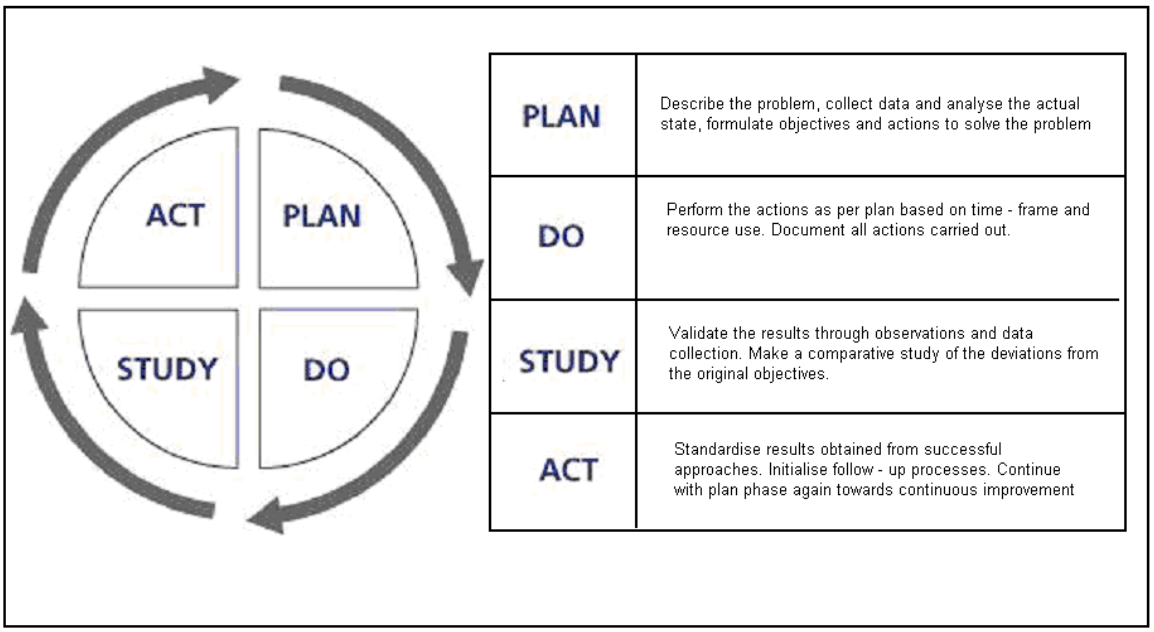

Figure 4.1: Deming PDSA Model (Deming, 1986)

The TQMII procedures and computational algorithms are presented in Section 3.13 and follow a circular approach. Other procedures include the Quality Action Program (QAP) for individual departments and the whole organisation. The authors contend that a value of TQMII above 0.5 as satisfactory towards sustainability of TQM. Based on Deming's PDSA approach, Kumar et al. (2004) developed an index called the TQM Implementation Index (TQMII) estimated using the formulae shown in Figure 4.2

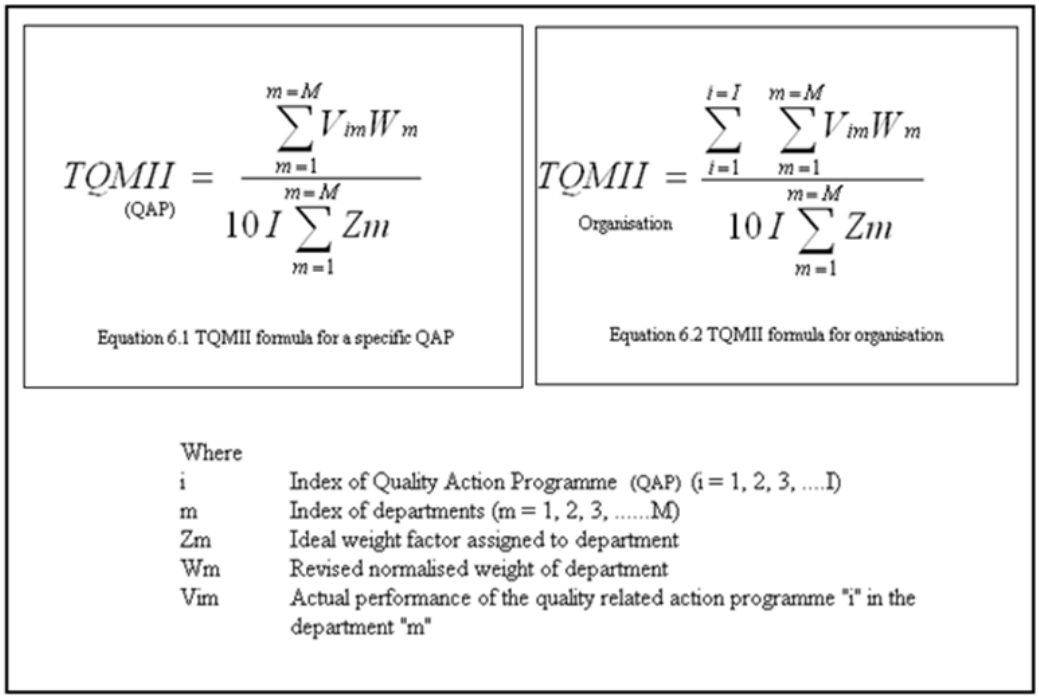

Figure 4.2. The formula is used to calculate TQMII.

4.4 European Foundation for Quality Management (EFQM Model)

Self-assessment is a fast growing method for standards and performance measurement (Zairi, 2005). EFQM (2010) is a diagnostic tool for evaluating the health of an organisation through internal (self-assessment) and external assessment modes. It supports organisations to balance its priorities, allocate resources and generate plans (Figure 4.3).

The self – assessment approach relies on honest and informed self-knowledge as the basis for building a culture of excellence. The self - assessment method supports management teams through a process of increased shared awareness about the availability of resources and how they have been allocated. Evaluation of EFQM self – assessment approach in higher education is favoured through a questionnaire, matrix chart, workshop, proforma and award simulation methods (Hides et al., 2004). Recently, Gómez et al. (2015) reviewed the internal relationships of the EFQM model, which was applied to 199 Spanish industry companies in order to measure each of the sub-criteria In addition Hemsworth (2016) assessment of the EFQM excellence model in 306 purchasing agents within manufacturing identified the specific relationships between purchasing's quality management practices (EFQM enabler), internal customer

satisfaction, and business performance (EFQM results). However, van Schoten et al. (2016) used the EFQM model as a framework for TQM in healthcare in hospitals in Netherlands to improve the organisational performance over time. The EFQM excellence model is considered one of the most effective tools for conducting effective change in organisations (Sharifi et al., 2015).

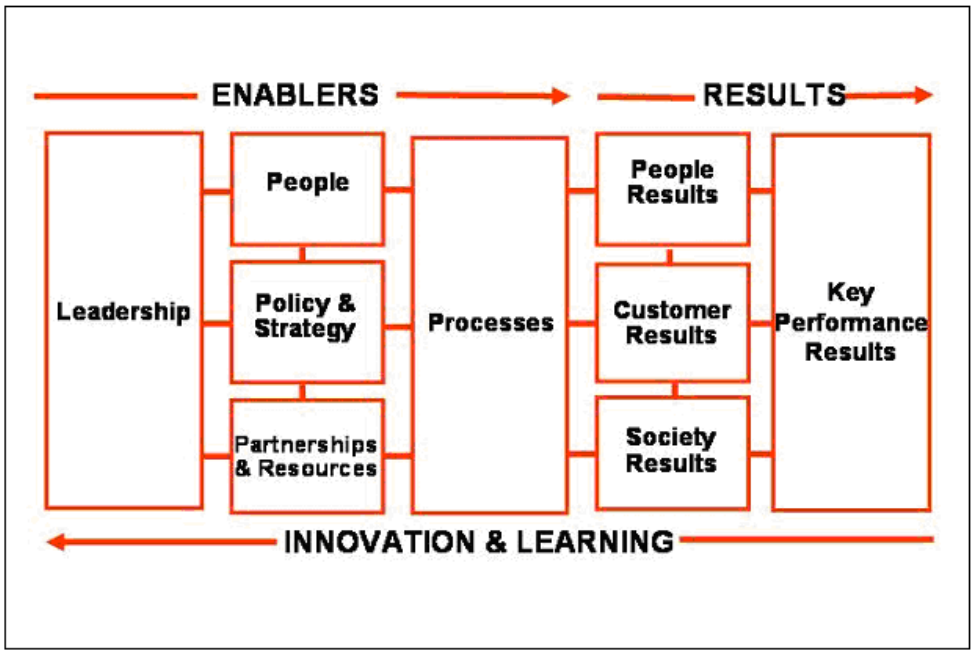

Figure 4.3: Structure of the EFQM Model (EFQM, 2010)

4.5 Quality in Higher Education

Decrease in student numbers, increases in tuition fees and delays in graduation are some of the problems currently faced by higher education institutions (Seymour, 1992) Considering the need for quality, UNESCO has initiated a quality assurance program to ensure that acceptable standards of education, scholarship and infrastructure are being maintained (UNESCO, 2009). Csizmadia (2003) argues that quality management can play a role in the context of meeting stakeholder demands and there is a need to understand the reaction of higher education institutions towards quality improvement initiatives. Thus, Quality Management in Higher Education Institution needs to involve overseeing all the activities and tasks needed to maintain a desired level of excellence in stakeholder outcomes (i.e. staff, students, employers, research, impact/funding etc.). This includes creating and implementing quality planning and assurance (Dick and Tarí, 2013).

According to Mincer (1962) the standard method of estimating the rate of return on educational investment does not take the quality of education into account. It is concerned only with quantity and measures this only by the years or grades of schooling. Poor quality teaching can result in a lower rate of, an educational investment which will reflect in the ratio of budgetary allocations that are referenced to the economic growth (Lim, 2001). Moreover, there is a need for studying the change in institutional and organisational culture while implementing quality management (Csizmadia, 2003; Srikanthan and Dalrymple, 2002).

Kuldvee (n.d) noted that quality in higher education is determined by clear and acceptable characteristics, objectives, and regulations. Regulations in higher education can be divided into two main parts: external and internal (or institutional self-regulations). External regulations are the principles, rules, expectations, and conditions which define the scope and the nature of regulation, and are determined by a regulatory authority which is independent of the higher education provider. External requirements are according to their nature, usually minimum requirements, but in some cases, are also typical. Internal regulations relate to the activities and actions of a higher education provider which are not subject to external regulatory controls. The principles, rules, expectations and conditions which define the scope and the nature of regulation are determined by the institution, although they will be influenced by interaction with the constituencies and markets it serves (Kuldvee, n.d).

The UNESCO description of quality in higher education is the standards of inputs, processes, and outputs of a system, an institution, or a program. It has no meaning without relevance. Quality is a multi-dimensional concept and embraces all the functions and activities of higher education, i.e. academic programs, research, and community services, in all their features and components; namely, infrastructure, equipment, human resources, students, objectives, nature and content of programs, delivery modes and implementation practices, academic and socio-cultural environment. Quality mechanisms are implemented through continuous assessments and comparisons between observed and intended processes and a constant search for sources of dysfunctions to be corrected (UNESCO, 1998).

Quality in higher education, the non-compulsory educational level after school, is yet to be developed as a discipline (Grunberg, 2007). Some of the challenges facing quality

management in higher education are customer focus, measurement of quality and integrating externally imposed quality models within the internal framework of the university system (Holmes and McElwee, 1995; Tarí and Juana-Espinosa, 2007) Although EFQM, ISO and UNESCO based quality programs have been initiated, a universally acceptable quality model is yet to be reached (Guellali, 2008).

Many developing countries are worried about the quality of higher education (Ngwira et al., 2003; Grunberg, 2007). Some of the developed countries including Australia and New Zealand are also apprehensive about the effectiveness of their quality improvement programs (Avdjieva and Wilson, 2002). Despite the fact that universities in these countries had initiated quality initiatives much earlier, cultural barriers were found to limit the application of TQM processes. The South African Development Conference has also called for quality auditing programs based on the stakeholder demand and for moves to understand the cost effectiveness of the higher education programs (Ngwira et al., 2003).

The EU is aiming to become the world leader in terms of its educational and training systems (Gueorguiev, 2006). However, Guellali (2008) expresses concern in the German context - a major EU partner, that the country's higher education is complicated by the subsidiary role of the state coupled with the plurality of service providers. Although data from all over the world is unavailable at this stage, Guellali (2008) is of the opinion that this situation may the case for most developing countries as well.

According to Jeliazkova and Westerheijden (2002), there are four different areas of concern underpinning Quality Assurance (QA) in higher education:

1. Serious doubts about educational standards
2. Doubts about the efficiency of higher education system and/or institutions
3. Doubts about innovation capacity and quality assurance capacity of institutions
4. Need to stimulate sustainable quality culture in institutions

An evaluation of status indicates where a particular system stands in the above hierarchy of concerns or phases. For example, Kuldvee (n.d) considered that the Estonian higher education is at phase (1), despite its government enacting a law called Universities and Standard of Higher Education Act in 2003.

Customer satisfaction is the main concern of quality management, not only in industrial and service organisations but also in education institutions (Durakbasa et al., 2001). In this context, it is appropriate to enquire who the customers of higher education are. According to Gueorguiev (2006), the primary customers are students. However, Selvaratnam, (2005) and Redmond et al. (2008) suggest that although students are the main beneficiaries of education, parents, prospective employers and society as a whole have different interests and it is important to note that their perspectives differ from each other in what they see as higher education. In addition, the idea of understanding the nature of the "customer" with regard to e – learning and distance learning scenarios is vital to develop modern and technologically-based higher education (Selvaratnam 2005). While undertaking a TQM adoption survey in higher education, Svensson (2004) observed that the usage of the word "customer" has been a hindrance to many participants.

Another issue related to quality in higher education is the challenges that are associated with academic staffing. According to the UNDP (2005), there are too few staff overall which leads to a number of problems which all perpetuate weaknesses, they include the following:

1. Staff available are not always organised optimally to provide adequate course coverage for the maximum benefit of students
2. Teachers in most universities are overloaded, leading to slippages and limited research
3. Full professors are scarce and thus, academic leadership and influence are often lacking
4. Too many staff teach in areas outside their current specialisms
5. Scarce, fully qualified staff are being used to teach elementary courses such as basic computer skills to non-computer scientists and introductory topics and thus, specialist knowledge is not called upon
6. A lack of training in new pedagogic techniques
7. Infrequent mentoring
8. Insufficient dissemination of good practice

9. A general absence of support for junior staff.

4.5.1 Total Quality Management in Education

Using concepts from Resource Based Theory and Systems Theory, Reed et al. (2000) showed that the process of Total Quality Management (TQM) has the potential to improve sustainability in manufacturing industries. (Srikanthan and Dalrymple, 2001) argued that this principle can be applied to higher education institutions as well, but it would require the adoption of methodologies, which are different from manufacturing industries. This is because of the characteristics specific to the higher education systems (Sirvanci, 2004). For example, managing professors or scientists in a university requires a different approach to that employed with the staff of a manufacturing industry. In this context, some of the quality management principles based on manufacturing industries needs to be reviewed. According to Dale (1996), the following features are involved in a sustainable TQM:

- Individual TQM elements.
- The overall process of improvement.
- The holding of the gains made.

The synergies between quality and sustainability are particularly relevant to higher education (Sirvanci, 2004). While some universities in developed countries have initialised TQM activities already, some developing nations are still in the process of drawing plans for it. In'airat and Al-Kassem, (2014) stress that TQM is one of the most efficient tools in the field of teaching and learning provision in education.

A fundamental question raised by Elmuti et al. (1996) was whether the adoption of TQM will be effective in higher education at all. This question was raised on the basis that TQM is often visualised as a system that leads to a competitive advantage in commercial business. The managerial criteria favoured by TQM limits the productive activity of individuals (Holmes and McElwee, 1995). This is because legitimising the formal ways of working in an academy, alien corporate cultures begin to be suffused into organisational life. These cultures are not synonymous with the macro culture of the higher education institutions. This actualises itself in constant realignments and shifts in hitherto accepted ways of working.

Despite these pessimistic views, a survey of administrators and stakeholders in Mid – Western USA showed support for TQM in higher education, as it not only resulted in savings but also in many indirect benefits (Elmuti et al., 1996). A majority of respondents favoured the adoption of TQM in universities, although funding was considered as a major constraint in its implementation (Csizmadia, 2003).

In the context of Australia, Srikanthan and Dalrymple (2002) argue that the quality management models adopted from industry into higher education were not successful and there is a need for developing a holistic model, particularly suited to the university system. There are many reasons for considering cultural issues in the adoption of TQM for education as the motivations of the academics are usually free from market economics (Sirvanci, 2004; Selvaratnam, 2005). Even though culture is agreed upon as a major barrier, Isaksson and Wiklund, (2001) suggested that TQM is less suited to third world (or developing) countries due to the lack of forces to drive it. Therefore, while TQM is a philosophy and system for continuously improving the services and/or products offered to customers (In'airat and Al-Kassem, 2014),the managerial criteria favoured by it can limit the productive activity of individuals (Holmes and McElwee, 1995).

Thackwray and Hamblin (1996) conclude that it is possible to adopt an externally assessed national standard that is uniquely flexible for integrating with each HE institution and a study by Redmond et al. (2008) revealed that the following six, of the fourteen, principles advocated by Deming are important for adoption in higher education.

4.5.2 Deming and EFQM Models in Higher Education

The Deming philosophy focuses on bringing about improvements in quality by minimising uncertainty and variability in the way a service is delivered (Deming, 1986). According to Redmond et al. (2008) an example of variability in higher education can happen in approaches of the teachers. For example, a teacher wants to teach based on the student requirements and another wants to teach based on the course outline.

The relevance of six of Deming fourteen principles in quality management in higher education are summarised below (Redmond et al., 2008):

Principle 2. Adapt a new philosophy with management learning what their responsibilities are and by assuming leadership for change

Deming's profound knowledge system has four components - Appreciation for a system, understanding of variation, theory of knowledge and psychology. This system highlights individual transformation in the organisation. Higher education centres are knowledge-centric, but the education programs are often of poor quality due to many inadequacies including incoherent curricula and inefficient administration.

Principle 3. Cease dependence on mass inspection for quality by building quality into the service

The traditional approach to quality is an inspection. This includes inspecting the behaviour of employees. Like in manufacturing an inspection event in an academic situation often results in a waste of time and energy. Deming suggested building quality into service rather than inspection in service.

Principle 5. Aim for continuous improvement of the service to improve quality and decrease costs

Striving to be responsive to the students and other stakeholders, improving curricula, promoting the highest academic standards, and constantly monitoring educational outcomes are some of the points highlighted in the case of higher education.

Principle 7. Institute leadership with the aim of supervising people to help them to do a better job

This is considered as an important aspect. In higher education, the student must be of central importance to the leader. Many past works have highlighted the importance of the leader in higher education. Leadership needs to have a connection with all parts of the organisation. In this way, quality becomes a shared responsibility of all.

Principle 8. Drive out fear so that everyone can work effectively together for the organisation

Fear at work will affect everyone and their ability to work effectively in a team; past studies have revealed that higher education is more vulnerable to the fear factor due to concerns about reputation, career advancement, inter – personal rejection and loss of self – esteem. Higher education managers need to eliminate fears to create academic freedom and creative work.

Principle 9. Break down barriers between departments and encourage departments to work together

Deming advocated that for best results a team should consist of persons with varying opinions, strengths, and experiences. In higher education lack of knowledge about each other's role and unclear definition of skills makes it difficult to organise teamwork.

It can be said that the six principles chosen for discussion are rather limited. There are others among the 14 principles which are also relevant to higher education (for example principles of training and craftsmanship). The PDSA approach described in Section 4.3 of the Methodology chapter derives the fundamentals based on all the 14 principles of Deming.

The quantitative approaches and empirical validation associated with Deming PDSA can be both internal and external; this contrasts with the EFQM model, which supports explicit internal assessment tools. Many past studies on higher education have focused on self – assessment component of the EFQM model. Examples include leadership categorisation UK higher education (Osseo-Asare et al., 2007), use of EFQM approach in eight university administration services in Spain using a questionnaire based approach (José Tarí, 2006), evaluation of EFQM for application in higher education of Greece (Alexadris S. S., 2008), and a study on the effect of culture in EFQM model in UK universities (Davies et al., 2007).

Although the PDSA and EFQM models show differences in the structure of the approaches, common elements linking these two approaches can be identified (Martín-Castilla and Rodriguez-Ruiz, 2008), (Figure 4.4)

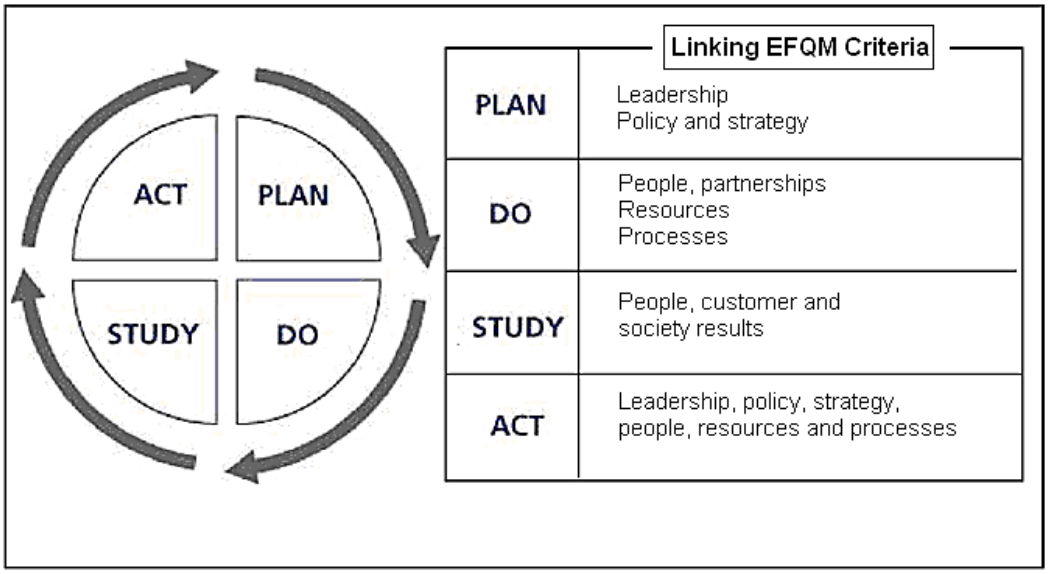

Figure 4.4 Deming PDSA and the linking EFQM criteria, (Adapted from (Martín-Castilla and Rodriguez-Ruiz, 2008)

Hides et al. (2004) made an assessment of the European Foundation for Quality Management (EFQM) excellence model for quality measurement and described the specific issues in implementing the model in the higher education system of the United Kingdom. While focused on the choice of self- assessment methodology comparisons were made with self-assessment issues in the wider public sector. It was concluded that EFQM excellence model self- assessment could help to produce a more customer-oriented culture in Higher Education institutions, provided that the lessons learn from the wider public sector were put into practice.

The EFQM model was also evaluated in the institutions of Spain. Tarí and Juana-Espinosa (2007) evaluated it using a questionnaire approach in eight university administrative services. This study contributed towards academic knowledge by providing evidence of useful behaviours to managers of university administrative services and even for other public sector organisations. Results of the study indicated that a university administrative service could use self- assessment as a tool for continuous improvement planning as is done in the business sector. The support of a facilitator might help to ensure success where there is not enough knowledge on quality. Self-assessment might be a fruitful way to stimulate quality improvements in educational organisations (Svensson, 2004). The EFQM model was found to be one

such useful tool in the self – assessment of university administrative services in the UK (Hides et al., 2004). In Spain, the EFQM approach was considered for achieving more customer oriented culture based on the lessons learned in the public sector (Tarí and Juana-Espinosa, 2007). Many TQM models implemented in Germany were not completely compatible with each other, and their competence was realised only partially (Guellali, 2008). So far, no model has gained unanimous support from the scientific community and service providers of Germany. After analysing four types of quality models including the ISO and EFQM, a few criteria emerged from the German context (Table 4.1).

Table 4.1: Some criteria evolved towards quality enhancement of higher education in Germany (Guellali, 2008)

Criteria for	**Observations**
Program Quality	The goals are feasible and reasonable. The program is learner-focused. Conditions for good cooperation between teachers and learners. A summative, as well as a formative learning evaluation, takes place The program bears a close relation to practice with an appropriate need assessment and care after the end of courses, skills transfer is assured.
Teaching Quality	Teachers have the necessary qualifications and professional experience to reach the learning goals Teachers are considered as internal customers.
Learning Quality	Learners have clear and feasible learning goals. Learners cooperate and participate actively in courses Learners develop and evaluate strategies for lifelong skills transfer and lifelong learning.
Institution Quality	The institution has a clear corporate philosophy. The institution has enough resources to reach its goals and The institution works in a customer-focused way.

4.6 Quality Assurance in the Higher Education

As discussed above, Quality Assurance (QA) refers to any action directed toward providing consumers with goods and services of appropriate quality. This is usually associated with some form of measurement and inspection in a systematic fashion (Garvin, 1988). In this section, some of the major agencies involved in QA activities within higher education across the world are described (ICTED, n.d; UNESCO, 2009).

4.6.1 Quality Assurance in the United Kingdom

The UK Quality Assurance and Accreditation (QAA) process is one of the most well documented processes amongst developed and developing countries. The definition of quality assurance in Higher Education has significantly evolved in the last ten years. Zwanikken et al. (2013) referred to quality assurance as “the policies, attitudes, actions and procedures necessary to ensure that quality is being maintained and enhanced”. As the UK higher education grows and diversifies it needs to safeguard standards and support the improvement of quality for students. However, quality assurance action planning is more effective in the United Kingdom and enhanced on a regular basis as quality monitoring (Lucas, 2014).

The Quality Assurance Agency(QAA) and the Higher Education Funding Council for England (HEFCE) have both recommended that incorporating sustainability factors will give greater importance in programmes delivered through Higher Education Institution(HEIs) in the UK (Gough and Longhurst, 2015). According to Zwanikken et al. (2013), “Assurance of quality in higher education is a process of establishing stakeholder confidence provision (input, process and outcomes) fulfils expectations or measures up to threshold minimum requirements”.

The QAA is funded by subscriptions from the UK's higher education institutions (HEIs), and by the higher education funding councils, including the Scottish Funding Council (SFC), for whom it performs contract work. It works closely with the higher education sector's 'stakeholders': the funding councils, universities and colleges, staff, students, and employers and acts as a think-tank, a spokesperson, and a watchdog. The QAA is responsible for the management of much of what is called the "academic infrastructure" – the guidelines, resources, and procedures that both enable and constrain the activities of the UK's higher education institutions. Key guidelines of this academic infrastructure are: the Quality Code for Higher Education (Anon., 2016); frameworks for higher education qualifications (Raffe et al., 2008) and the Scottish Credit and Qualifications Framework; and programme specifications.

4.6.2 Quality Assurance and Accreditation Process Around the World

According to National Centre for Education Statistics (NCES), United States Department of Education, higher education includes two levels of education covering vocational programs and advanced graduate degree (NCES, 2009). The first level contains two types of programs - vocational and academic. The vocational programs provide a level of education that is designed to prepare students to enter directly into the labour market. Academic programs at the first level of higher education bachelor/master degree programs are intended to provide sufficient qualifications for entering advanced research programs and professions with high skill requirements. At the second level, academic programs include doctoral studies and usually require the completion of a research thesis or dissertation. The role of higher education is significant in national economies, not only as an industry by itself but also as a producer of trained manpower.

In the United States, engineering and technology educational program accreditation is conducted by the Accreditation Board of Engineering & Technology (ABET, Inc.). ABET, Inc. is a non-profit organisation that serves the public by accrediting United States post-secondary degree programs in applied science, computing, engineering, and technology. Accreditation is intended to certify the quality of these programs. ABET is also responsible for leadership internationally via workshops, consultation, memoranda of understanding, and mutual agreements, such as the Washington Accord. ABET has been recognized by the Council for Higher Education Accreditation.

In Germany, the engineering and technology educational programs' accreditation is conducted by the Accreditation Agency for Study Programs in Engineering, Informatics, Natural Sciences, and Mathematics (ASIIN) and in Australia, by the Institution of Engineers. Upon review of engineering education in Australia in 1996, Engineers Australia revised the accreditation procedures resulting in the 'Manual for the Accreditation of Professional Engineering Programs' published in 1999. This was revamped in 2004 into a modulated form of documents organised as the Engineers Australia 'Accreditation Management System' (AMS).

The ISO 9000 family of international standards is primarily concerned with the following aspects of quality management, which an organisation has to fulfil (Gueorguiev, 2006):

1. The customer's quality requirements

2. Applicable regulatory requirements while aiming to
3. Enhance customer satisfaction and
4. Achieve continual improvement of its performance in pursuit of these objectives.

The ISO 9001: 2000 requires that all activities within an organisation are to be understood and implemented as a system of interconnected processes. The parameters of the ISO 9001 specifications considered for quality evaluation in higher education are continual examination of the students' knowledge and evaluation of the lectures (Durakbasa et al., 2001). These two sub-solutions are evaluated in the form of a "lecture matrix" and corrections are derived from this matrix. The students have the opportunity to evaluate the lecture using the student's questionnaire which includes the following areas:

- Treatment of the students
- Selection of the studying material
- lecture style
- Mediation of the contents and
- Selection of the examination questions

The UNESCO Global Forum on International Quality Assurance, Accreditation and the Recognition of Qualifications aims to provide a platform for dialogue between international frameworks dealing with quality assurance, accreditation and the recognition of qualifications (UNESCO, 2009). The Global Forum responds to the growing demands of the international community to have UNESCO proactive in the debates concerning borderless higher education and trade in higher education in frameworks such as the GATS as well and the related key issues of quality and recognition.

In Canadian QAA initiatives, Weinrib and Jones (2014) argue that two organisations have emerged to support the coordination of quality-centred policies at the national, provincial and territorial levels, which have legislative authority over the degree-granting institutions within their jurisdictions, and amongst universities across provincial boundaries. The Council of Ministries of Education, Canada (CMEC) has

also become actively engaged through the establishment of the Canadian Degree Qualification Framework (CDQF).

Currently, the Higher Education Sector in China has developed a QAA system that includes two categories: Faculty staff and students, in order to enhance the quality of higher education and its influence on university governance and academic performance (Wang, 2014).

Hosny et al. (2016) identified the Egyptian initiatives of NAQAAE with 16 accreditation standards which are comparable to the accreditation/quality assurance standards adopted in other parts of the world. The standards are primarily set to motivate the improvement of the quality of learning in Egyptian Higher Education Institutes (EHEI). The 16 standards were reduced to 14 in 2013 to avoid redundancy. The standards are divided into two streams, one related to institutional capacity and the other to educational effectiveness.

The United Nations Development Program's report on the Quality Assessment of Education Programs in Arab Universities provided various recommendations for institutions selected by the Program to participate in its 'Enhancement of Quality Assurance and Institutional Planning' project at the Regional Bureau for Arab States. For example, Qatar University established a Quality Assurance Group that subsequently metamorphosed into the Office of Academic Evaluation. In 2006–2007, the Office of Academic Evaluation (OAE) was established as a part of the reform project and is recognized as an Internal Quality Assurance Unit responsible for the development and implementation of the student learning outcome assessment process and for other quality assurance processes, including academic program reviews and administrative units' periodic review processes. These elements are essential to ensure the quality of QU academic offerings and to ensure that the competencies of QU graduates are aligned with labour market outcomes. In 2007, the OAE developed a Student Learning Outcomes Assessment System (SLOAS) to assess the program level student learning outcomes and to ensure the continuous improvement of academic programs offered at the university (Al-Thani et al., 2014).

This brief introduction to quality in higher education across the world is summarised in the following table

Table 4.2: A sample list of countries with quality initiatives

USA	Some universities and colleges in the USA have already started using quality improvement models. Among those are Georgia Tech, Maryland, North Dakota, Oregon State, Penn State, Purdue, Rochester Institute of Technology, and Wisconsin (Hogg and Hogg, 1995).
Australia	Universities in Australia are subject to regular quality assurance audits by an Australian Universities Quality Agency from 2001.
Estonia	The Universities Act and Standard of Higher Education were adopted by the Estonian government from 2003, towards enhancing the quality (Kuldvee, n.d)
Uruguay	The ORT University of Uruguay has recently initiated some quality management processes (Grunberg, 2007)
Canadian	In Canadian Universities, the development of new types of degrees, combined with an expansion of degree-authority to new institutional types have led to the emergence of new quality mechanisms in several provinces designed to assess the quality of new degrees, and universities that continue to play the central role of QAA (Weinrib and Jones, 2014).
Chinese	QAA system in HE China have been highlighted the importance of involving the elements of QAA in the Universities that included (facility and students) to enhance the quality of HES (Wang, 2014).
Egypt	The National Authority for Quality Assurance and Accreditation in Higher Education (NAQAAHE) was established in 2006 as part of the reform agenda of the education system in Egypt. And all institutions were mandated to comply with the set national standards and apply to NAQAAE for national accreditation(Hosny et al., 2016).
Qatar	In 2006 – 2007. Qatar University, the recommendations were tracked and implemented and established a Quality Assurance Group that subsequently metamorphosed into the Office of Academic Evaluation. However, the conceptualization and experiences of a quality assurance initiative implemented by Qatar university (Al-Thani et al., 2014).

The previous sections have examined how different models of quality management might be linked and the background to quality assurance and accreditation in higher education has been considered. The next section will introduce the concept of sustainable development before aligning these with the work on quality to develop a model of Sustainable Quality Management (SQM).

4.7 Sustainable Development

Sustainable development was discussed for the first time on a global level at the UN Conference on the Human Environment, held in Stockholm in 1972 (Kaivola and Rohweder, 2007b). This meeting for the first time put environmental concern on the international political agenda. The shift from a concern for the environment to a concern for sustainable development was a result of the next milestone in 1987 when the UN World Commission on Environment and Development published a report entitled Our Common Future (also referred to as the Brundtland Report).

The World Commission on Environment and Development (WCED) initiated the commonly used definition for sustainable development that is based on the principle of inter – generational equity (Brundtland et al., 1987).

"Sustainable Development is a development that meets the needs of the present generation, without compromising the ability of future generations to meet their own needs."

The United Nations through The Earth Summit or the Rio Conference, held in 1992, launched an action plan called the Agenda 21. It contained principles in the categories of environmental, economic and social sustainability as well as peace. (UNCED, 1994). Other important conferences related to global sustainability were the Kyoto Conference held 1997 and the Johannesburg Summit on Sustainable Development in 2002. The original issue of sustainable development had the main focus on limits of economic activity and ecological sustainability (Hediger, 1999).

These activities have put pressure on governments to introduce legislation on sustainable development that also followed into organisations. In general, corporate sustainability refers to company activities demonstrating the inclusion of social and environmental concerns in business operations and interactions with stakeholders. The following section describes two of the models of sustainable development.

4.7.1 Triple Bottom Line (TBL) Model

In 1997, author John Elkington reported the subject of Triple Bottom Line, which is also referred as TBL (Elkington, 1999, Elkington, 2004). The TBL is a framework of sustainable development concepts for organisations that can be translated into operations. According to Elkington (2011) sustainability required a new paradigm shift that is referred to the three lines in TBL: (1) Economic prosperity (2) environmental quality and (3) social equity. In simple terms, the TBL implies to take into account the environmental and social performance in addition to financial performance (Isaksson2004). Elkington's sustainability model includes seven factors of revolution including markets, values, transparency, Lifecycle technology, partnerships, time and corporate governance. Some of the related terms, which were developed based on the TBL, are organisational sustainability and Corporate Social Responsibility (CSR) that deal with sustainable development aspects related to private sector organisations (Agrawal et al., 2016).

Recent studies focus on TBL dimensions at an operational level in manufacturing processes, maintaining the economic and technical feasibility achieved up to this moment. One study particularly focused on the optimization of sustainable machining processes; even though numerous studies exist which optimize machining operations with the aim to find the trade-off between different environmental and social factors through the TBL approach (Álvarez et al., 2016).

One of the key trends in the literature conducted by Schulz et al. (2016) has been the movement from research on specific social issues, environmental issues or economic performance towards integrated 3BL paradigms. However, firms in competitive industries are likely to see the 3BL activities as opportunities to establish a competitive advantage as demands from customer, employees and external stakeholders influence purchasing activities, workforce loyalty and public opinion.

4.7.2 Five Capitals Model

The Five Capitals Model developed by the Forum for the Future, a charity organisation in the UK, describes sustainable development through the Five Capitals as principal elements. It is based on the notion that human consumption of natural, human and social capital is faster than these are being produced (FF, 2010) (Figure 4.3) The Forum for Future has developed twelve features characterising a sustainable society (Table 4.3). Unless the rate of this consumption is controlled, these capitals cannot be sustained in the long-term. This model holds that by maintaining and increasing the stocks of these capital assets, humans can live without reducing the capital itself. For this to happen, it is the responsibility of every organisation, business or otherwise, to manage these capital assets through sustainable approaches.

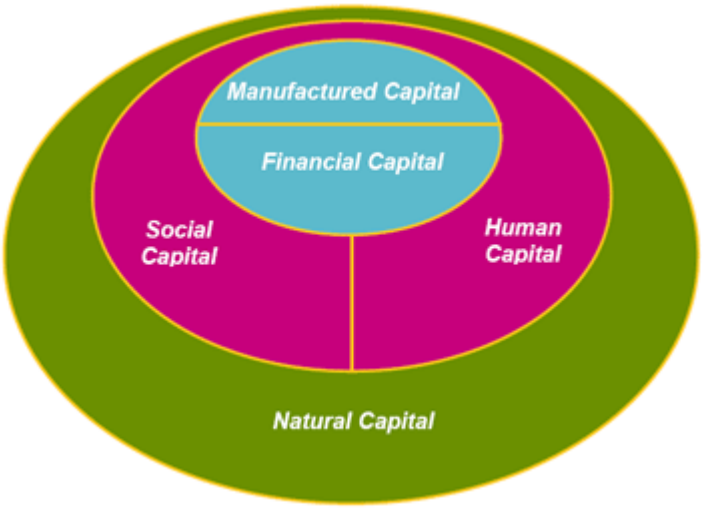

Figure 4.5: Elements of the Five Capitals Model (FF, 2010)

Table 4.3: A description of the five capitals and the 12 features model that is used for evaluation of sustainability (adapted from (FF, 2010)

Natural Capital (basis for not only production but life itself)
1. Recycle or neutralise harmful effects of materials extracted from earth 2. Recycle or neutralise harmful effects of manufactured goods 3. Provide ecological system integrity and biological diversity
Human Capital (People, health, knowledge, skills and motivation. Education is central)
4. Individuals enjoy a high standard of health at all ages 5. Individuals are adept at relationships and social participation achieve high personal standards of their development and learning 6. Individuals find opportunities for work, personal creativity and recreation
Social Capital (Institutions that help develop human capital e.g. Family, school, unions)
7. Trusted and accessible systems of governance and justice are available to all 8. Communities and societies share positive values and a sense of purpose 9. Societies promote natural resources and development of people 10. Communities and societies provide safe, supportive, living and working environments of Manufactured Capital 11. Minimum use of natural resources and maximum use of human innovation and skills in technology and infrastructure
Financial Capital (Enables other capitals being owned or traded; itself has no value)
12. Financial capital accurately represents the value of natural, human, social and manufactured capital
Manufactured Capital (Materials for production process: e.g. tools, buildings)

From the review of literature presented it is noted that features (1), (2), (3), (7), (9) and (11) are not adequately represented in many quality models and requires further research.

4.7.3 Strong and Weak Sustainability

Apart from the Five Capitals approach and TBL described in the previous sections, organisational sustainability is also described using weak and strong sustainability (Isaksson2004) (Figure 4.6).

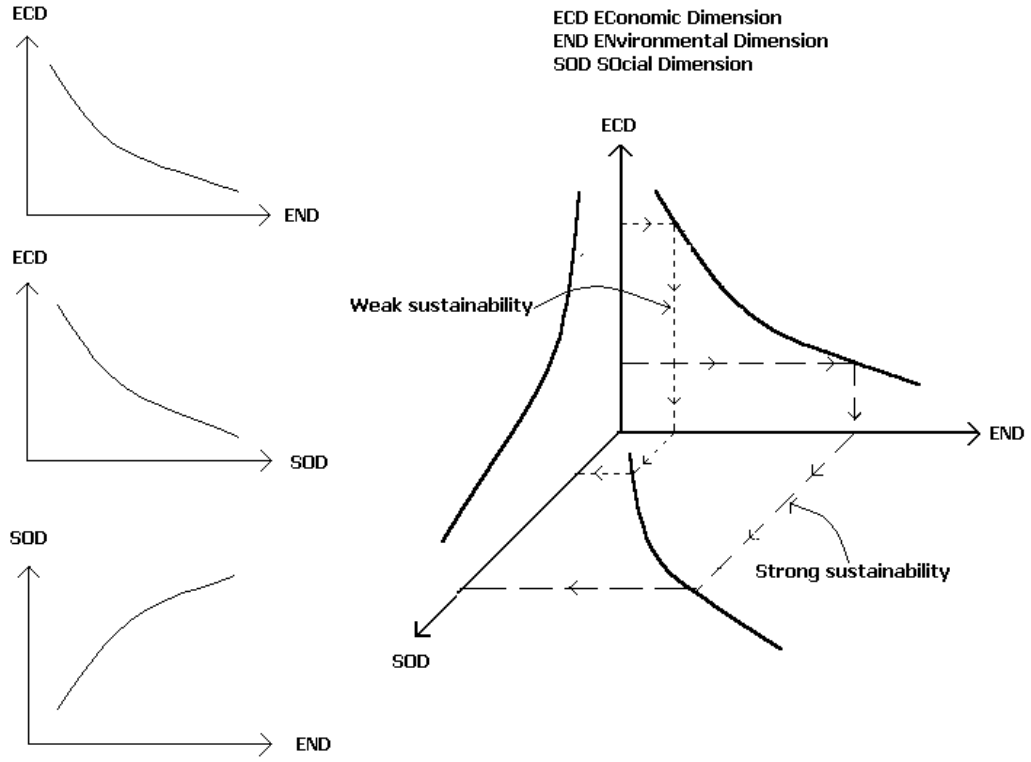

Figure 4.6. A description of weak and strong sustainability based on the of the TBL (Derived and modified from (Isaksson2004)

In recent years, a number of articles have examined the pros and cons of a link between sustainability and the capability approach (Martins, 2011; Polishchuk and Rauschmayer, 2012; Griewald and Rauschmayer, 2014). However, none of these authors has located natural capital within a more holistic approach such as the Five Capitals model of Forum for the Future, a notion that lies at the core of strong sustainability (Pelenc and Ballet, 2015). The notion of natural capital was introduced by a number of ecological economists at the beginning of the nineties. The works of

Hediger (1999) and Isaksson and Wiklund (2001) presented a description of four levels of weak and strong sustainability; these were considered as distinctions between Econo - centric and eco-centric positions (Table 4.4).

Table 4.4: Strong and weak sustainability, (Hediger, 1999; Isaksson and Wiklund, 2001)

Term	**Description**
Very weak sustainability	General production capacity is maintained intact Per - capita consumption is constant over time Resource exploitative and implies an increase in per – capita GNP
Weak sustainability	All types of capital are equivalent Natural capital can be substituted by man-made capital
Strong sustainability	Development or regeneration of renewable natural resources matches or exceeds depletion of non-renewable natural resources
Very strong sustainability	Natural capital should increase or, at least, be maintained at a constant level Reduction of resources consumption Limiting human scale activities to zero population growth

Some of the criteria are as follows:

Intra - generational and inter - generational equity leads to strong sustainability.

The consideration that all types of capital are equivalent leads to weak sustainability.

The consideration that natural capital and man-made capital can be perfectly substituted it leads to weak sustainability.

When compared to the 12-feature model discussed in the previous section these descriptions are considered as more general guiding principles. Moreover, the strong sustainability approach assumes that the substitutability between natural capital and other forms of capital should be strictly limited to the circumstances where the use of the services provided by natural capital does not lead to the irreversible destruction of this capital because its depletion cannot be compensated for by investing in other forms of capital (Neumayer, 2012). Therefore, the strong sustainability approach holds that certain elements of natural capital are "critical" due to their unique contribution to human well-being (Dedeurwaerdere, 2014). Pelenc and Ballet (2015) progress this

argument by stressing that natural capital allows us to make a distinction between weak sustainability and strong sustainability.

4.8 Sustainable Quality Management

Because quality determines the longevity of a business, it is intrinsically related to sustainability. There are many ways by which this issue can be viewed. Reed et al. (2000) analysed this relationship between quality and sustainability as the basis for competitive advantage. Zairi (2002) traced the transformation of quality management and sustainable development, which have brought different orientations over time. Measurement of sustainability is related particularly to the rising trend in strategic performance and it was emphasised that maintaining competitiveness does not simply emphasise the present, but also the future.

In past decades, many organisations opted to implement TQM and often found it difficult to sustain it after one year (Lund and Thomsen, 1994). Whether quality ethos sustains the very organisation or not is often ignored by the leadership (Schneider et al., 1996).

According to Robson et al. (2002), sustainability in the long-term requires evaluating organisations for external factors such as a changing environment in addition to using internal parameters such as profitability and cash flow. Suitability of TQM implementation in developing nations is likely to face barriers from the existing cultural and value systems (Isaksson2004). These issues have prompted authors to focus on an alternative framework that will sustain TQM. Eventually, it paved a way for an emerging subject – the Sustainable Quality Management (SQM). Isaksson and Wiklund (2001) propose a framework which includes drivers, values, methodologies and tools for interfacing TQM and sustainability (Table 4.5).

Table 4.5: Drivers, values, methodologies and tools for interfacing TQM and sustainability

Drivers	Values	Methodologies	Tools
Environmental groups, NGOs legislation based on Agenda 21, customers demanding green companies and fair trade and good value products; competition; management culture.	Leadership commitment; stakeholder focus; focus on sustainability, systems perspective; continuous improvement (PDSA);	Self-assessment based on criteria in sustainability focused BEM; applying Integrated Management Systems; the TNS. Process.	Criteria from modified Business Excellence Models based on MBNQA Program and EFQM Excellence Model; Integrated Management Systems for the TBL based on ISO 9001, ISO 14001, SA 8000, BSI-OHSAS 18001, AA1000 and "Economic Assurance"
Higher pace of change with the need of quicker decisions; management culture	Focus on processes	Company ride BPM and BPI in the economic, environmental, and social dimensions - change processes; benchmarking	Process charting; relating different types of measurements to a process map; process models.
More powerful stakeholders; management culture	Let everybody is committed; base decisions on facts; accountability; transparency	Working with stakeholder dialogue; stakeholder development; applying the modified GRI - guidelines; using Six Sigma; applying inclusiveness; auditing based on TBL	Structure for stakeholder dialogue; process indicators for the Triple Bottom Line including quality measurements; TBL standards; ecological footprints

James (1994) and Dale (1996) are credited with being the early authors who identified and advocated the need to shift paradigms from TQM to SQM. Zailani (2009) reports that there has been an increasing interest in the subject of SQM in recent years.

The subject of SQM is viewed from many perspectives by different authors. Dale (1996) said that "One of the widely-used definitions for TQM is continuous improvement, in time. When coupled with sustainable practices, the TQM components lead to the notion "sustainable continuous improvement". A more detailed definition is provided by Svensson (2006) who said "SQM examines the sustainability of values, tools and techniques of quality management in general and TQM in particular. It explores a holistic quality management system that integrates economics, environment and ethics" and Kumar et al. (2004) says that "Evaluation SQM depends on prominent CSFs that define the TQM processes".

Svensson (2006) discussed further the impact of added components of TQM such as sustainability of values, tools and techniques and laid focus on the design of strategic perspectives of Sustainable Quality Management. It was contended that quality management in general and TQM, in particular, can be scrutinised based on the sustainability of values, tools, and techniques. Insights on theoretical managerial ideas were presented in order to anticipate non- sustainable TQM practices.

After a preliminary verification of a series of hypotheses in 20 organisations, Zairi (2005) concluded that TQM sustainability is largely dependent on transformational change, having critical factors in place to enable superior performance. It also requires the instigation of a culture of continuous improvement and learning towards the balanced perspective. Isaksson (2005) analysed the cost of poor quality and concluded that existing economic sustainability performance measurements based on the distribution of surplus should be complemented with indicators for internal losses.

The Balanced Scorecard method, developed by Kaplan (1992) has recently gained acceptability; it measures sustainability along four perspectives – financial, customer, internal business and innovation and learning. Based on Deming's PDSA approach Kumar et al. (2004) developed an index called the TQM Implementation Index (TQMII) as shown in (Section 4.3 : Figure 4.2).

4.9 Sustainable Quality Management in Higher Education

The fact that quality and sustainability are interlinked can be learnt from a recent description of the Ukrainian experience in higher education (Gorobets, 2008). During events that followed the fall – out of the Soviet era, many academics crossed the border, and the lack of quality in higher education lead to low - ranking universities. In this

scenario, the Ukrainian students preferred to study in the high-ranking universities in the neighbouring countries, lowering the revenues of Ukrainian universities. Unable to cope up with decreased revenues, the higher education system in Ukraine is facing serious sustainability problems in recent times and the lessons learnt from this situation highlight the need for people focus.

The World Summit on Sustainable Development held in Johannesburg in 2002 reaffirmed the importance of sustainable development as a base for overcoming poverty and improving the quality of life worldwide, especially in the developing world (Al-Saadi, 2010). As a follow-up, the United Nations General Assembly adopted the resolution - United Nations Decade of Education for Sustainable Development (DESD), proposed by Japan and co-sponsored by forty-six countries.

Subsequently many national organisations and universities are involved in developing and implementing higher education curricula on sustainability (Segovia and Galang, 2002; UNDP, 2002; HEFCE, 2009). A report by Rusinko (2005) illustrated how environmental sustainability and management theory can be integrated based on a class exercise and points to the fact that the "Sustainability in Higher Education" can be a driver for "Sustainability of Higher Education" through innovations that would emerge in due time.

Sustainability in Higher Education (HE) has been widely advocated as more than an add-on to existing University practices (Cebrián et al., 2015); some Universities sees as a new way of organising and profiling themselves (Wals, 2014). However, Müller-Christ et al. (2014) stressed that the change towards sustainability requires whole-university approaches that connect curriculum, campus, research and community strategies and action.

Some universities in the UK have developed strategies for the sustainable development of their campuses (UWE, 2012; DMU, 2012; UoA 2009). Campuses require methods of comparison to each other as well as to a vision of a "sustainable college or university" to ensure that they are moving in the right direction (Shriberg, 2002). A sustainable campus can be a significant part of the infrastructure of a sustainable higher education.

Examples of sustainable strategies for higher education initiatives at universities include teachers' training colleges in Papua New Guinea, for which the following factors were

identified by Nongkas (2007), as hampering sustainable management of teacher's training colleges:

1. Leadership and administration hegemony.
2. The scarcity of funding/infrastructure.
3. Negative effects of curriculum level.
4. Hegemonic and Colonial practices (in a previously colonised country).
5. Lack of equitable partnership with all stakeholders.

Another example of such strategies includes Yildiz Technical University in Turkey.

The Department of Geodesy and Photogrammetry Engineering of Yildiz Technical University (YTU) in Turkey, has initialised a mission towards high quality and sustainable education activities. Cüneyt Aydin (2006) introduced the Sustainable Quality Education System (SQUES), which included thirteen commissions and a preliminary strategic plan prepared towards reaching the objectives of sustainable development. Based on Strengths, Weaknesses, Opportunities and Threats (SWOT) approach, the Geodesy department of the YTU University in Turkey has recommended the following strategies for sustainable development of its education programs (Cüneyt Aydin, 2006):

1. Decreasing the number of students.
2. Improving office and laboratory facilities.
3. Increasing the number of research projects and encouraging the members to develop new research projects.
4. Creating work opportunities abroad for the young researchers and to support them attending national and international meetings.
5. Improving international collaborative efforts.
6. An increasing the number of on-line journals and other research resources sources.
7. Increasing the number of national/international journal articles

The YTU, still in the planning stage, has derived its initial sustainable development strategies by studying the rates of change of parameters (1), (3), (6) and (7).

4.10 An Overview of the Critical Success Factors

A set of values, tools and techniques unites the descriptions of TQM and similar wordings are also used to describe principles, procedures and tools (Svensson, 2006). Core values include customer focus, leadership, employee participation, business processes, continuous improvement, measurement focus and ethics (Isaksson and Wiklund, 2001) and these form the critical success factors of TQM and ultimately sustainability. Svensson, (2006) argued that sustainability itself can be viewed as a core value of TQM and that there are close inter-relationships and interdependencies among these core values. The extensions and boundaries of sustainable quality management have to be measured against these core values as critical success factors. Therefore, the critical success factors of TQM and specifically, sustainability as part of TQM are presented here.

Table 4.6: A review of CSFs included in past studies

Authors	CSFs included in the study													
	Customer focus	Employee	Continuous improvement	Leadership	Process	Comprehensi	Culture	Ethics	Stakeholder balance	Measuremen t	Future orientation	IT Application	Benchmarki ng	Training
James (1994)	*		*			*		*			*			
Dale (1996)		*	*		*		*							
Isaksson and Garvare (2001)	*	*	*	*	*					*				
Hughes and Halsall (2002)	*	*	*	*	*		*				*		*	*
Zairi (2002)	*		*				*							*
Isaksson (2004)	*				*		*					*		
Kumar et al (2004)	*	*	*	*	*		*		*	*	*		*	*
Trevor (2004)	*	*		*				*		*	*			
Osseo - Assare et al (2005)		*		*	*			*	*	*				
Akdag (2006)	*	*	*	*	*	*			*					
Svensson (2006)	*		*							*	*	*		
Davies and Douglas ((2007)							*							
Tari (2006)	*	*	*	*	*	*			*					
Alexandris (2008)	*	*	*	*	*	*			*					
Redmond et al (2008)		*	*	*	*		*							
BSI (2010)	*	*	*	*	*							*		*
In'airat and Al-Kassem, (2014)	*	*	*		*					*				*
Zakuan et al. (2012)	*	*	*	*										*
Gherbal et al. (2012)	*	*	*				*							*
O'Mahony and Garavan (2012)	*	*	*	*	*					*				
Karahan and Mete (2014)	*	*	*	*										
Ahmed and Ali (2016)	*	*	*	*	*					*				*
Shokshok (2014)	*			*	*		*			*				
Zubair (2013)	*	*		*										*
Goetsch and Davis (2014)	*	*	*				*							*
Todorut (2013)	*	*	*	*										*
(Zwain, 2012)	*	*	*	*	*					*				*
Khanam et al. (2016)	*	*	*		*		*						*	*
Mohammed et al.(2016)		*	*	*						*				
Rosa et al. (2012)	*	*	*	*	*									

An empirical literature survey conducted by the researcher on Critical Success Factors (CSFs) of TQM is presented in table 4.6 illustrates how different authors considered the seven CSFs more frequently featured in the literature, which included Leadership,

Policy and Strategy, continuous improvement, people focus, customer focus, training, and process management. These seven CSFs were considered for exploration through the existing literature and are presented in the following sections.

4.10.1 Leadership Factor

Mohammed et al. (2016) stress that leadership appears to be a major element in TQM implementation in the Higher Education process; Top management should be committed and involve in creating and supporting a customer focus with high expectations, and clear goals. The role of leadership in setting quality strategy direction and sustaining effective leadership throughout the organisation is considered important (Lit, 2003). Whether an organisational change, based on quality management ethos, sustains an organisation or not is often ignored by the leadership (Schneider et al., 1996). Change is made and if it fails the leadership resorts to another change. At times, this process is repeated and again and at the end of a failed chain of changes, the leadership finds that the organisation cannot be sustained any further. A study conducted by Found et al. (2006) observed that at least 50 percent of improvement programs were deemed by the firms involved to be failures over the longer term and up to 70 percent failed to achieve all of their intended benefits. This raises serious issues of sustaining long-term success rather than quick wins which are often fleeting. In this context, Robson (2002) noted that apart from evaluating organisations internally using parameters such as profitability and cash flow, it is also important to evaluate them externally for growth and a changing environment. In recent years, an increasing interest in the issues concerning sustainable quality management has been noted (Svensson, 2006).

4.10.2 Policy and Strategy Factor

Sustainable development has become an important issue at international, regional and national levels concerning education policy over the past few years (Kaivola and Rohweder, 2007b).

However, Found et al. (2006) argued that successful and sustainable business process change cannot be achieved by improving any particular process, as it involves

appropriate technology, people management and process routes which must be aligned to the meet the strategy and objectives for the change. Towards this goal, Kemp et al. (1997) identified an integrated list of strategies relevant to TQM sustainability (Table 4.3).

Table 4.7: Strategies for TQM Sustainability adopted (Kemp et al., 1997)

Categories	**Components**
External Environment	Competitors, Employee resourcing
Internal Environment	Customer Focus, investment
Management style	Industrial relations, workers' relations
Policies	TQM Conflicts – HR, Financial, Maintenance, Manufacturing
Organisational Structure	Supervisory / Departmental
Process of Change	Improvement of Infrastructure, education and training, teamwork, procedures, etc.

Deming's circular approach - Plan – Do – Study - Act (PDSA) - can be considered as a strategy for sustainability of TQM (Figure 4.4; (BSI, 2010); (for a description of the method see (Section 4.3). A similar circular approach was outlined by Svensson (2006) stressing the need for revisiting the preceding stage after the subsequent stage, based on the values, tools, and techniques (Figure 4.5).

It is recalled here that in the system language, Deming's PDSA and Svensson's circular approach can be described as "Implicit Feed Back" systems, wherein the output is recycled through the original input. This kind of a system with a large number of variables can lead to a computational situation that is unstable and often computer algorithms are used to iterate through to find an acceptable solution. This aspect may require further exploration.

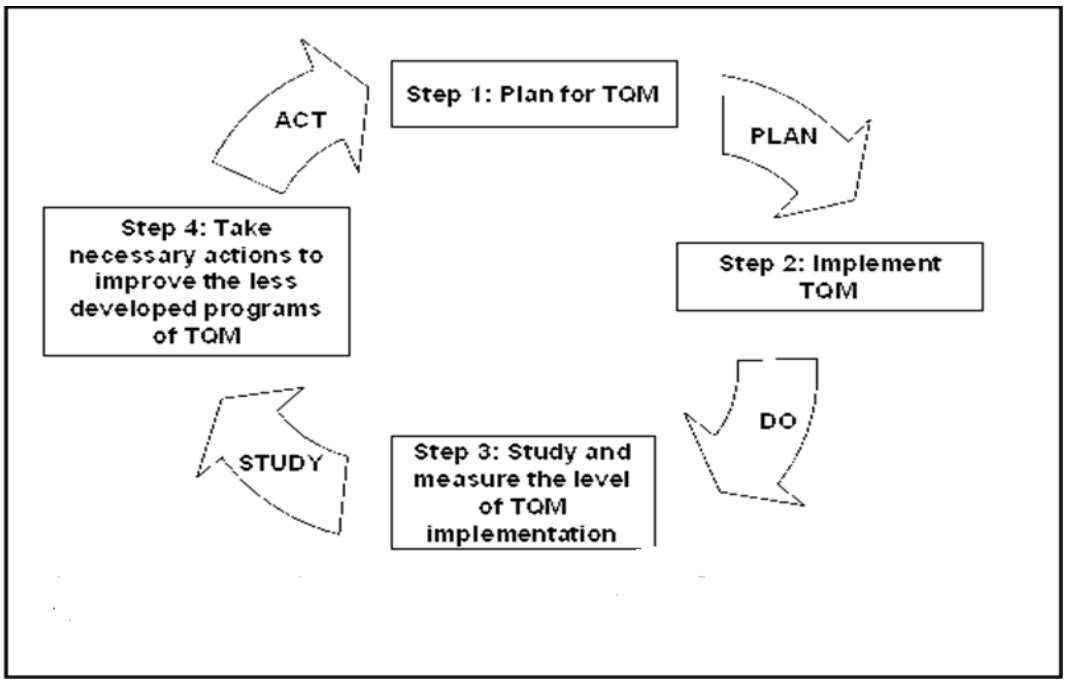

Figure 4.4: Implementation of TQM Sustainability based on Deming's PDSA Method (BSI, 2010)

Figure 4.5: A circular approach to sustainable quality management (Svensson, 2006)

According to Lund and Thomsen (1994), the following are symptoms of a TQM process becoming unsustainable:

- The results are not visible.
- Top management commitment is not seen and is not felt.

- Middle management does not know precisely what is expected of them in relation to the TQM process.
- Low degree of employee involvement.
- The organisation changes priorities often and quality decreases.

Among these, (3) and (4) were considered by Found et al. (2006) in a study of employees views on sustainability. In order to sustain TQM initiatives after a year of implementation, Lund and Thomse (1994) recommended an eleven - point programme, presented in Table 4.8

Table 4.8: Eleven points method to sustain TQM processes (Lund and Thomsen, 1994)

	Importance for our company					Comments and ideas
	Low				High	
	1	2	3	4	5	
1. Quality and service improvements must be a habit at all levels in the company						
2. Every manager must incorporate service and quality activities in his or her own department plans						
3. The company must make an annual TQM status and a plan for the following year						
4. The company must make an annual marketing plan for the TQM process						
5. Make your TQM results visible in the whole organization						
6. The company must integrate service and quality results into the recognition and reward system						
7. Quality status days for middle managers are a good catalyst for the TQM process						
8. Service and quality training must be a part of the introductory education of all new employees						
9. Make a specific plan for how top management can be visible in the TQM process						
10. Quality reviews must be included in the annual appraisals						
11. Establish benchmarking relationships to other companies and use it for increasing the TQM ambition of your company						

4.10.3 Continuous Improvement Factor

One of the widely used definitions for TQM is continuous improvement in time (Dale, 1996). When coupled with sustainable practices, the TQM components have to embrace sustainable continuous improvement, making the time profile of the processes more intensive (Curry and Kadasah, 2002). Quality management and sustainable development

have brought different orientations in time (present and future) and the measurement of sustainability is related particularly to the rising trend in strategic performance (Zairi, 2002). TQM Continuous improvement is generally the accepted ideal, however, there are no such definitions of what is meant by sustaining improvement, and there is considerable confusion on the matter (Dale, 1996). For example, when does the introduction phase of TQM come to an end and the sustaining phase take over? In the higher education context Lozano-Ros (2003) argued for tools that can measure the performance of sustainable development to be developed. Towards this goal, an understanding of the barriers to, and methods of, introducing and continuing a sustainable development ethos in the university system is required. The fact that most studies reviewed on this topic do not lead to a point where sustaining continuous improvement can be a measurable parameter indicates that there is considerable scope for further work in this area. In'airat et al. (2014) states that "Total and continuous quality development is viewed as a journey which has no real beginning or ending". Thus, it is a constant endeavour for the management to sustain a criterion in the institutions.

4.10.4 Employees Participation Factor

In addition to the critical success mentioned above, Schneider et al. (1996) suggested values with people focus, considered as an important component of TQM Sustainability as follows:

1. People desire growth and development and can be creative when they have opportunities.
2. People value interpersonal interaction, both with peers and with superiors, making the formal and informal nature of such relationships a salient feature of organisational life.
3. People need trust, support, and cooperation to function effectively; zero-sum, win-lose competition in organisations is not useful, and may even be destructive.

To be sustainable is not only a matter of internal economics but also participation and involvement of the employees (Schneider et al., 1996). Moreover, focus on the employees has implications from the very beginning, during the recruitment process, for TQM sustainability (Ahmad and Schroeder, 2002). Napierala (2012) argues that one of

the five major factors in TQM is the commitment of employees within the organisation; they should be aware of the TQM rules and aware of corporate goals. According to Yeh (2003), some of the critical factors which engage or hinder employee participation in TQM sustainability are as follows:

1. Individual training
2. Project involvement
3. Job characteristics
4. Organisational structure
5. Social support
6. Self-efficacy

Among these factors (4) and (5) were found to significantly influence TQM sustainability and factor (1) had little influence.

Another way of measuring sustainability is to confirm the rate of change and its impact on the beliefs of the employees (Found et al., 2006). A typical set of survey response of such results is presented in Table 4.9. Successful implementation of a TQM and Sustainability environment requires a committed all the employees at all levels within the Institutions and should be encouraged to take responsibility and communicate effectively toward improving the quality at all levels in the Higher Education Institutions. Gherbal et al. (2012) suggest that all employees within the organisation are considered as internal customers and treated as if they were external customers.

Table 4.9: Typical set of employee beliefs in sustainable change

Description Belief	**Response in Percent**		
	Disagree	**Not Sure**	**Agree**
I believe that the rate of change is appropriate	15.0	17.8	67.1
I believe that the changes will succeed	9.3	13.3	77.3
I understand the reason for change	5.3	4.0	90.6

4.10.5 Customer Focus Factor

Improvement strategies such as Six Sigma and quality assurance based on ISO 9000 aim at customer satisfaction and an improved bottom-line by reducing the costs of poor quality. Therefore, Gherbal et al. (2012), as highlighted above, stress that the customer's focus is one of the major elements of the framework of TQM and all elements focus on total customer satisfaction, both external and internal, and defined as the degree to

which a firm continuously satisfies customer needs. Focus on customers and quality could be seen as very weak sustainability, depending on the focus of other stakeholders (Isaksson2004). Shareholders, customers, suppliers, employees and society all have legitimate expectations from an organisation. In this context, methodologies based solely on customer focus such as the ISO 9000, are required to adopt more holistic approaches.

4.10.6 Process Management Factor

Recently, using process-based models Isaksson (2004), reported some basis for linking the synergies between TQM and sustainability. Organisational sustainability can be evaluated as performance based on the Triple Bottom Line (TBL, economy, environment, and social responsibility) and process models can be used to structure the large number of indicators used to describe the TBL. This approach proposes to integrate TQM and sustainable development, using quality indicators which are added to the economic dimension. Results suggested that, although this type of system-based process model can be used to understand synergies between TQM and SD for a specified industrial environment, further research is required to validate them for more generalised use.

4.10.7 Training Factor

Training is one of the Critical Success Factors (CSFs) of Sustainable Quality Management (SQM). Training is defined by Oakland (2003b) as the "planned, systematic development of the knowledge, understanding, skills, attitudes and behaviour patterns required by an individual to perform adequately a given task or job". The training and development of company employees are essential for organisational operation and advancement. Education and training can improve employees' knowledge and skills and can have an important influence on their development and lead to an increased sense of belonging (Oakland, 2003a). Training refers to the acquisition of specific skills or knowledge. Training programs attempt to teach employees how to perform particular activities or a specific job (Zhang, 2001; Sabet et al., 2012) Schonberger (1992) concludes that the role of training as a link between an

organisation's quality management strategy and its ability to create and maintain an advantage is likely valid but, unfortunately, he does not provide any clear statements on how training actually achieves this linkage. In the literature, however, there exists a well-established link between training and firm performance. Ferketish and Hayden (1992) stress the importance of education and training for continual updating and improvement, emphasising that employees inherently want to learn and develop.

Ahire et al. (1996a) believe that an employee empowerment and involvement framework is not effective unless employees have received formal, systematic training in quality management. Ahire et al. (1996b) indicate that Xerox's quality training was successful because it began at the top of the organization and progressed downwards, giving employees at all levels visible role models. Top management should be convinced that the present level of performance is not good enough and that something could be done about it.

Several recent empirical studies have revealed that training is critical to successful TQM implementation (Ahire et al., 1996b; Black and Porter, 1996; Deming, 1982; Flynn et al. 1994; Hardie, 1998; Powell, 1995; Saraph et al., 1989). Furthermore, Yusof and Aspinwall (2000) advise organisations to examine performance problems first and then provide the proper training to eliminate them. They recommend that management should initially focus on behaviours, such as identifying and solving problems and team working to support improvement. The organisation should complete a "needs assessment" first, from which companies could determine what is right and what is wrong, and then gear the training program to address the problem areas so that workers can do their jobs more efficiently and effectively. Examples of training courses for TQM implementation include leadership skills, communications, teamwork, problem solving, interpreting, and using data, meeting customer requirements, process analysis, process simplification, waste reduction, cycle time reduction, error proofing, priority setting based on cost and benefit data, and other training that affects employee effectiveness, efficiency, and safety. Therefore, the TQM system in some institutions demands the comprehensive training of employees (In'airat and Al-Kassem, 2014).

4.10.8 Values and Ethics Factor

Values can transform unsustainable societies into sustainable ones (Lozano-Ros, 2003). A set of values, tools and techniques unites the descriptions of TQM, and similar

wordings are also used to describe the above, which include, but are not restricted to, principles, procedures, and tools (Svensson, 2006). Core values include customer focus, leadership, employee participation, business processes, continuous improvement, measurement focus and ethics (Isaksson and Wiklund, 2001). However, Svensson (2006) argued that sustainability itself can be viewed as a core value of TQM and that there are close inter-relationships and interdependencies among these core values. The extensions and boundaries of sustainable quality management have to consider the reconnection of the loose ends among the core values and the intermediate values defined between these core values.

The social value system which is based on ethics is comparable to a flowerpot that sustains the life of plant system (Thierstein and Walser, 2005). Ethics are considered as a core value of TQM sustainability, which describes more clearly about social responsibility (Isaksson and Garvare, 2003). In recent times, this has resulted in a proposal to use the Triple Es - Economy, Environment, and Ethics (referred as 3E). The 3E is often used as the main dimensions for measuring organisational sustainable development.

While the values discussed above, determine what is right or wrong for an organisation (for example integrity, professionalism, and teamwork) how these values are translated into organisational behaviour governed by ethics. While there is a consensus on the principles of sustainability and their supporting concepts, differences according to local contexts and priorities will persist.

The United Nations Development Program (UNDP) has prescribed another national level indicator for ethics, namely, the Human Development Index (HDI), which combines life expectancy, educational attainment and income (UNDP, 2008; Isaksson and Garvare, 2003). After its inception in 1990, the HDI has been criticised for lack of essence focus on its approach to representing the real world situations.(Srinivasan, 1994; Sagar and Najam, 1998). In addition to the above, the Commission on Sustainable Development (CSD) and the UN Economic and Social Council (ECOSOC) have developed a set of indicators covering the themes of Social, Environmental, Economic, and Institutional Sustainability.

4.10.9 Culture Issues Factor

Culture is the way in which groups of people solve problems and reconcile dilemmas (Schein, 1985). Organisational culture can be viewed as universal or particular (Trompenaars and Hampden-Turner, 1999), universalism in culture implies that if some process works in one place successfully, it can always be applied to another place without modifications (Trompenaars and Hampden-Turner, 1999). On the other hand, particularism focuses on relationships and context that determines action. Also, culture can also be classified based on high or low individualism – the degree with which the society reinforces individual or collective, achievement and interpersonal relationships. Low individualism implies a more collective culture.

The fact that culture is viewed as a set of values and beliefs takes it to the point of time dependence; accordingly, its orientations can be long term or otherwise, depending on the degree to which a society embraces or does not embrace traditional values. Sequential orientation in time indicates the ability to measure one activity at a time and reluctance to change plans. On the other hand, synchronic orientation depicts a multi – task society that depends on relationships and remains flexible in following plans. Societies can also be classified per risk aversion, high uncertainty, or low uncertainty.

The Trompennaars and Turner models divide societies into four cultural groups - family, Eiffel tower, guided missile and incubator (Trompenaars and Hampden-Turner, 1999); these classifications are based on various criteria such as employee relationship, response to authority and orientations in thinking. Cameron and Quinn (2005) developed a Competing Values Framework with the following sub – groups:

The Clan culture: Friendly, sharing and 'familial' culture where leaders are mentors; loyalty and tradition provide cohesion; long-term benefits to individuals basis of morale; sensitivity to customers and concern for people; premium on teamwork and consensus.

The Adhocracy culture: Dynamic, an entrepreneurial and risk-taking society characterised by innovative leaders; experimentation and innovation provides the cohesion; growth oriented; individual initiative and freedom encouraged.

The Hierarchy culture: Formalised, structured and governed by procedures; coordinators and organisers lead the system, efficiency-minded; formal rules and procedures provide cohesion; the long-term concern is with stability and security of employment.

Market Culture: Results oriented and competitive; leaders drive the system hard to make it competitive; cohesion through competition; long-term is driven by goals and targets; success depends on market share and penetration.

Culture is an issue for the successful implementation of TQM. Quality culture is driven by the attitudes and perceptions of the employees, and TQM sustainability depends on its implementation in day-to-day organisational life (Curry and Kadasah, 2002; Zink, 2007). Based on a self - assessment approach conducted in 450 service organisations, Robson et al. (2002) concluded that organisational culture was an important driver for TQM sustainability. An understanding of culture interfaces, which sustain TQM, is a matter of considerable importance for the present study. Todorut (2013) also indicates that culture key to effective quality management in a faculty or University.

The boundary between TQM as a management program and TQM as an organisational culture is not well defined (Zairi, 2005). Many of the TQM elements reviewed contain individual dimensions or elements that could be interpreted as belonging to organisational culture or climate. However, Flood (1993) argued that the essence of TQM itself is a culture change and that TQM practices are merely tools for cultural transformation.

TQM practices are formal, programmatic and behavioural, whereas culture refers to values, attitudes, beliefs and situational interactions (Schneider et al., 1996; Zairi, 2005). One clear operational distinction between the two is that cultural dimensions can be readily recognised without TQM. The functional aspects of culture have to involve psychological analysis of the employees, as the beliefs are mirrored in shaping organisations. In this functional context, Schneider et al. (1996) identified three dimensions as follows:

1. The nature of interpersonal relationships: Is there mutual sharing and trust or conflict and mistrust? Are relationships between functional units (e.g., between production and sales) cooperative or competitive?
2. The nature of the Hierarchy: Are decisions affecting work and the workplace made only by top management or are they made with participation from those affected by the decision?

3. The nature of work: Is the work challenging or boring? Are jobs adaptable by the people performing them, or are they rigidly defined so that everyone must do them the same way?

According to Zink (2007), a fundamental change culture is more important than merely focusing on product quality; this is one reason why imitating the "Japanese Way" in Western companies has failed

4.11 Summary

At the beginning of this Chapter, a brief history of quality management was presented. This was followed by an introduction to the philosophical foundations and definitions of experts in the field of quality management with the objective of understanding the possible contribution of these systems to higher education.

A survey of the recent literature showed that the quality management of higher education is still developing as a discipline, and there is considerable scope to conduct further studies in this area. Although some developed countries have started quality initiatives, these activities are based on local approaches that are specific to universities. Most quality management models were developed for the manufacturing sector, and the translation of these for higher education requires an understanding of the cultural aspects, which are influencing academic institutions. Many developing countries are yet to start a quality programme, and there is a need to develop a quality model which is universally acceptable in higher education.

A review of the two models used for evaluation in this study was presented and their link elements identified. Past studies on the application of these models were reviewed. It noted that the while the PDSA model relies on external quantitative methods, the EFQM based self – assessment was focused on many past works.

The TBL and Five Capitals approaches on sustainable development pointed to the fact that there is a need to shift from Econo-centric approaches to eco – centric approaches. Some drivers and barriers to sustainability were identified, and aspects related to strong and weak sustainability were also discussed. It is demonstrated that some features of the sustainability models are inadequately represented in the quality frameworks.

The problem faced by the sustainability of TQM in many organisations has resulted in a new thinking and the evolution of the subject of SQM. Application of SQM in higher education would require a focus on some key issues associated with CSFs. The next

Chapter presents an account of such approaches and a research design that can enable to answer the research questions of the study (A gap analysis).

Chapter 5 Rhetoric and Reality of Education Quality in Libya: A Gap Analysis

5.1 Introduction

In section 4.8 a discussion was presented on the issue of using global models of quality management in higher education; it was emphasised that these models need to be calibrated for local social and cultural settings. This has highlighted the need for identifying the factors involved in the transnational transfer of quality management processes (Kostova, 1999). Most research studies on higher education quality management have been done with single national contexts, although higher education is viewed as an international business (Brookes and Becket, 2007). Therefore, it can be said that this is a limitation that global models face during implementation.

In addition to this, studies have shown that the technical reality of TQM is often distorted by the rhetoric generated by its own success stories (Zbaracki, 1998). At first, the managers tend to consume the rhetoric about the success story and then use that rhetoric to build a TQM program. Having been influenced by the rhetoric they are inclined to present the results towards their own success story. Such experiences point to the problem of translating principles into practice (Hackman and Wageman, 1995). In general, the gaps observed between management research results and practice call for more intensive development of frameworks and tools, which managers can use in implementation (Shapiro et al., 2007).

This chapter discusses an account of the gaps perceived in the context of adopting global models in Libyan Higher Education through the seven CSFs chosen for the study based on a content analysis presented in Section 4.8 a general description of the types of gaps is presented in Section 5.2 . From Section 5.3 to 5.9, the types of gaps for each of the seven CSFs is discussed regarding the Quality Action Programs (QAPs) based on perceptions in Arab and Libyan contexts, awareness among Libyan higher education leaders and visibility of gaps at various levels of the system. These discussions are based on available documented information and interviews conducted with Libya Higher Education experts at three levels into Libyan Higher Education Institutions. A list of the gaps observed at various levels of Libyan higher education is presented in Section 5.10 and Section 5.11 .

5.2 Types of Gaps

Through an analysis of gap models Weideman (2008) has identified the types of gaps that are generally perceived in organisations between service expectation and service delivery; a description of the five gaps is presented in Table 5.1. These descriptions are then used to identify the number of instances of these gaps for each CSF at the various levels in Libyan higher education institutions.

Table 5.1: Gaps perceived to occur between service expectation and service delivery (adopted from Weideman (2008)

Gap	Description	Possible reasons
Gap 1	The gap between customer expectation and management's perception of customer expectation	Mainly due to inaccurate perception at management level itself. This can also be due to lack of customer focus.
Gap 2	The gap during translation of perceptions into service quality	Despite understanding the need to change towards customer expectations, the organisation cannot implement it, due to lack of commitment at various levels. Others factors are financial constraints, profitability, lack of technology and unrealistic customer expectations
Gap 3	The gap between service quality and service delivery	Inability to deliver the service quality mainly due to a commitment from the employees; role ambiguity and low morale due to inadequate training and skills are further reasons (Section 4.9). Often the employees are unable to meet the requirements of a large number of demanding customers.
Gap 4	The gap between service delivery and external communications	This is predominantly due to lack of proper feedback mechanism at various levels of the organisation
Gap 5	The gap between customer perception of the service and final service received.	The customers have past experiences and that is related to the communications they have received. For example, during peak periods the service delivery is lowered but customers still expect the same quality.

The gaps discussed above are related to various CSFs chosen for the study; this is done by identifying and associating them with the QAP listed under each CSFs.

5.3 Leadership

Leadership is the single most important factor influencing the successful application of quality management principles (Smith, 2003). It was discussed in Section 4.8 that

leadership is also closely related to organisational sustainability (Schneider et al., 1996; Isaksson and Wiklund, 2001; FF, 2010).

According to the ISO, leaders establish unity of purpose and direction of the organisation. By creating and maintaining the internal environment, leaders help people to be fully involved in achieving the organisation's objectives (Youssef, 2006). Leaders also develop and facilitate the achievement of the mission and vision (EFQM, 2010). Deming stressed the need for the leadership to learn its responsibility and support everyone in the organisation to do a better job (Deming, 1986; Section 4.3).

Leadership often faces questions on the role of quality in the organisation, the measurement of quality, challenges faced in implementation and what actions the leader should take to implement the quality program (Juran, 2003). In addition, communication with all employees is another desirable leadership criterion (Section 1.2). Leadership needs to pay attention to placing employees where they prefer to work and feel they fit – termed as “right people in right place”. This is particularly important for higher education where specialists of different subjects meet together (Mehralizadeh and Safaeemoghaddam, 2010).

In the context of sustainability, the leadership criterion is required to be evaluated through certain attributes. For example, The Five Capital Model describes leadership requirements through awareness of natural resources, social justice and commitment towards incorporation of sustainability in financial process.

Table 5.2: Awareness, implementation and gaps in Leadership related QAPs (G- Government, Q- Quality Centre, U- University) (Gap1, Gap3 in table 5.1).

No	QAPs	Awareness/ implementation	Gap identified	Gap visibility levels
1	Leadership responsibility for quality.	The leadership commitment to quality is ascertained.	Gap1	Nil
2	Department Heads responsibility for quality.	The quality centre has drawn some plans	Gap1	G
3	Leadership participation in quality.	N/A	Gap3	G / Q / U
4	Department Heads participation in quality	Local university quality office proposed.	Gap3	G
5	Commitment to continuous improvement.	Leadership aware of this.	Gap3	G / Q
6	Commitment to quality training.	Specialized training programmes initiated.	Gap3	G
7	Relational behaviour-ability to connect to all.	The recent initiatives for decentralization are considered positive.	Gap1	G
8	Awareness of Natural Resources.	Some initiatives discussed in the national report.	Gap1	Q / U
9	Awareness of ethics and social Justice.	Some initiatives discussed in the national report. Need for social responsibility is highlighted by UNESCO.	Gap1	Q
10	Elimination of fear and academic freedom.	Awareness on the relationship of fear to quality.	Gap1	G /Q

According to Sheridan (1997) the success of the Arab economies is prominently due to political leadership rather than economic policies. The leadership of these countries facilitated the reforms required towards a stable government and infrastructure to facilitate an appropriate environment that was required for advancing economic growth (Youssef, 2006).

However while the UNESCO conference report noted the lack of the above-mentioned leadership qualities in Arab higher education it acknowledged that some Arab nations have initiated leadership promotion activities only recently (UNESCO, 2009). These include the Hussein Fund for Creativity and Excellence of lead assurance in higher Education institutions; the Creativity and Excellence Project of Saudi Arabia that encourages enhancement of leadership skills and the Faculty Leadership Development Project of Egypt. Heightened student activities in global politics have also called for social responsibility of the leadership on issues concerning conflicts, freedom, democracy, governance and human rights.

The Libyan leadership's initiatives on quality of higher education were implemented parallel to the UNESCO activities from 1998 – 2009 (UNESCO, 2009; Zaghouan, 2009). These can be divided into three stages (Zaghouan, 2009):

Stage I: A Decree (No. 164) from the government on the establishment of a quality programme in the year 2004. This was followed by preparation of scientific reports; output evaluation in terms of society's needs and the designing of the standards.

Stage II: In 2005 the government issued another Decree (No. 80) for the formation of General People's Committee for Higher Education. This committee also involved experts in the field of Quality of Higher Education.

Stage III: Following the UNESCO initiatives discussed in the previous Section, Decree No. 164 was amended towards the formation of Quality Assurance and Accreditation Centre in Libya (QAAC) in 2006. This centre was assigned the tasks of designing, developing and implementing a comprehensive system for QAQA activities (UNESCO, 2009). In addition, Libya has also planned to establish National Authority for Scientific Research (NASR), which will focus on the development of scientific facilities and research staff requirements in research. It is anticipated that a budget of US$6 billion will be allocated for these activities in the years to come; this budget also includes US$ 72 million towards integration of ICT in education (Hamdy, 2007; Sawahel, 2009).

The top leadership of Libya is committed to improving education quality and substantial funds have been allocated to for improving higher education (Hamdy, 2007). However studies have shown that at the university level leadership positions are often filled with those having lesser than required skills (Daw and Elkhammas, 2008). Libyan organizations generally suffer from a lack of vision and poor leadership (Youssef,

2006). Another concern is that recently the Education system has been decentralised with more powers handed to the provincial councils (Section 2.4).

5.3.1 Decentralisation of Libyan Universities

According to the Secretary of the Peoples Committee on Higher Education (SPCHE), who heads the Cabinet level position of the Libyan higher education system, the above-mentioned decentralisation efforts has increased the participation of the stakeholders:

Recent transitions in Libya lead to decentralization of higher education institutions. This shift in style of functioning – from individuals to task forces. As a result of this approach participation of everyone in the planning and management and decision-making, including faculty members and students has increased… (Secretary of Higher Education and Science Research).

The decentralization efforts and collective decision-making infrastructure can be considered as positive an indicator that is related to Deming's 7th principle 4.5.2 . However Ambarek (2010) argued that in the process of merging and de – merging of universities has led to a new and locally based university leadership which has to face the challenges of orienting itself to previously established (and federal government based) institutional frameworks. Again, this argument can be counteracted by the fact that limitation imposed by decentralization is temporary and that the central decision making is often seen as counterproductive structure due to the fear of top leadership. The director of quality in the

Faculty of Medicine Gharyan University in Libya supported this view:

…constraints in implementing quality management are central to decision-making and resistance to change due to fear of revealing defects…. (Director of Quality in the Faculty of Medicine at the University of Gharyan.).

Driving fear out of organisations is one of the Deming's principles that are particularly linked to higher education 4.5.2 . Higher education is more vulnerable to the fear factor due to concerns about reputation, career advancement, inter – personal rejection, loss of self – esteem etc. (Redmond et al., 2008). A mitigation measure proposed by the UNESCO towards this suggests administration financial and administrative freedom to the quality centre and its Departments in the universities (UNESCO, 2009).

In the context of sustainability awareness of societal results is considered important. The Director of Quality Management emphasized on this point.

...Reviewing of curriculum content and to identify the extent of compliance with the requirements of the market and meet the needs of society… (Director of Quality Management at QAAC...)

An account of awareness and implementation of leadership related QAPs are presented in Table 5.2. It can be said that there is a need for substantial transformation and change of Libyan leadership towards enhancing SQM, particularly at government and quality centre levels.

5.4 Policy and Strategy

Policy and strategy generally refer to the plan of the institution based on values and vision and how these are turned into actions; this activity is also referred to as deployment in EFQM model. Excellent organisations implement their mission and vision by developing a stakeholder focused strategy that takes account of the market and sector in which it operates. Policies, plans, objectives and processes are developed and deployed to deliver strategy (EFQM, 2010). Studies have shown that policy and strategy affects people management, partnerships, resources and processes (Calvo-Mora et al., 2006). Some research findings have indicated that policies and strategies are based on the needs of the customers and employees and are also reviewed and updated according to the changes in the external environment. The quality strategy architecture has ensured that quality improvement is integrated with the business policies of the organization (Kemp et al., 1997). Regular departmental meetings are advised on a quality strategy involving all in the organization.

5.4.1 Policy, Strategy, and Sustainability

The policy and strategy prescribed by the Five Capital model on sustainability require inclusion of TBL in the financial process, minimizing the use of resources and maximizing innovation. The deliberations presented in the UNESCO regional conference report points to the dilemma of the Arab states concerning resource use, quality and enrolment (UNESCO, 2009). One of the policy issues faced by Arab nations

(including Libya) is whether or not to increase the enrolment beyond the capacity and resources such as laboratories. Libraries and, more importantly, the teaching faculty. However, these nations and Libya have opted to increase enrolment beyond their resources and capacity that can be considered as a case for a very weak sustainability (Table 4.3; Section 4.7.3).

Therefore, for Libya and other Arab countries need to make a clear policy statement on available resources versus sustainable enrolment; available information in the UNESCO Arab regional conference report addresses this point only to a limited extent. In addition, it also requires evaluating the scope of innovations possible in resource use reduction. For example the use of Information and Communication Technologies (ICT) has the potential to minimize resource use as it can enhance the number of students a teacher can handle in a period and support in student and teacher training through the implementation of e – learning processes (Hamdy, 2007; UNESCO, 2009). A study on barriers and drivers of ICT has revealed that its potential is realizable for the case of Libya and the Libyan National Report has drawn some plans in this direction (UNESCO, 2009; Section 2.6 ;Table 2.3; GSPLAJ, 2004; Table 5.3). But little follow up actions have been reported on this aspect so far.

5.4.2 Teacher's pay policies and quality

One of the QAPs that can be considered important for the case of higher education is performance evaluation of teaching staff and rewarding them (Holmes and McElwee, 1995; Table 5.3). Studies conducted by (Rowe and Ingvarson, 2007) have shown that increasing the pay of teachers and promoting them will enhance teacher quality and help improve students' academic performances and experiences. In addition, higher salaries and bonuses were also found to reduce teacher attrition rates. The pay of the Libyan teachers are considered low and hence it requires to evolve strategies relating to the triangle of teacher-quality, student performance and merit-pay in order to enhance overall standards of education quality (Hamdy, 2007; Table 5.3). The policy evolved at the Arab regional conference has adopted to promote both student scholarships and teacher promotions towards a better quality of education (UNESCO, 2009). However subsequent reports on the actions taken on these aspects are not yet available for the case of Libya.

5.4.3 The Third Universal Theory

The 'Third Universal Theory' (TUT) proposed by the Libyan leader Muammar Qaddhafi outlines a political and social philosophy that has some influence on the policies and strategies envisioned by most public sector organisations in Libya (Obeidi, 2013; Section 2.4.2). This philosophy criticises both capitalism and communism as imported ideologies. The term 'Direct Democracy' is often used to describe a system of people committees at all levels that reports to the General People's Congress. These policies are based on Islamic principles (Section 2.4). However Muammar Gadhafi's initiatives to include women in the Military and prohibition of polygamy based on his interpretation of the Quran were subjects of religious opposition (Obeidi, 2013). Consequently, the religious leaders were given concessions to issue Fatwas (or verdicts) on none-Islamic practices. Ultimately these policy changes affected the way higher education is managed; for example, female students are not allowed to communicate with male students (Section 2.4.4 other related issues are listed).

The TUT advocates that knowledge is a natural right of human beings. Therefore, the first principle of it is to provide free education to all (Section 2.5.4). Other policy issues enlisted for higher education include an obligation for basic education at government level horizontal distribution of education across Libya and enhancing variability of education through specializations. A recent strategy is to open private sector universities with social inclusion as the objective (GSPLAJ, 2004; Section 5.7.2 Usually Libyan government provides detailed policy statements to all institutions (Alhmali, 2007).

The policy issues discussed above are not directly related the list of QAPs in Table 5.3. But it can be said that these are based on the societal requirements as perceived by the TUT and not based on actual feedback from the higher education stakeholders. In this context, Gap 1 is predominantly visible in Table 5.3 which depicts the gap between customer expectation and management's perception of customer expectation at the government level.

5.4.4 Policy for Encouraging Quality Culture

Culture is a set of values and beliefs and organizational culture was an important driver for not only TQM but also to sustainability (Robson, 2002; Section 4.10.9). The self – assessment approach proposed EFQM relies on self-knowledge as the basis of building

a culture of excellence (EFQM, 2010). Quality culture is driven by the attitudes and perceptions of the employees and TQM sustainability depends on its implementation on a regular basis in day-to-day organisational life (Curry and Kadasah, 2002; Zink, 2007).
The Director of the Quality Centre at Libyan Higher Education System has stressed the need for quality culture as a fundamental requirement for a change in Libyan higher education.

To develop a culture of quality educational institutions, and provide counselling, advice and guidance to educational institutions that has not achieved the required levels of quality… (Directors of Quality Centre in Ministry of Higher Education and Science Research).

…adoption of modern concepts in quality management means a change in the culture of the organization and its operations. This requires coordination with the community (Director of Quality Centre in Ministry of Higher Education and Science Research).

Therefore, the Libyan quality movement needs to incorporate policy and strategy initiatives which will encourage building a quality culture in higher education institutions. One of the means to achieve this is by raising the awareness of all stakeholders. The Director of the QAAC highlighted this aspect in his interview response;

The offices will issue periodic bulletins to encourage the culture of quality; illustrations will be focused on the adoption of standards and strive to consolidate themselves in the process of internal evaluation, which will be carried out at the end each year (Director in the Quality Assurance and Accreditation Centre. (QAAC).

This quotation also highlights the awareness of the respondent towards internal assessment. However, a direct reference to EFQM model that is favoured for internal self - assessment across many European and Mediterranean countries is not quoted in this interview response. Both these statements highlight awareness on the need for adopting quality models to the local culture (4.5.1).

Table 5.3: Awareness, implementation and gaps in policy and strategy related QAPs,(G – Government, Q–Quality Center, U–University)

No	QAP	Level of awareness / implementation	Gap identified	Gap visibility levels
1	Level of understanding of quality policy and strategy	Clear policy and strategy statements are unavailable	Gap 1	G / Q
2	Performance evaluation based on quality	Both self–assessment external evaluation methods are proposed at different levels.	Gap1	U
3	Importance for quality plan	A robust quality plan is not yet available	Gap 1	G / Q / U
4	Discouraging quality based on inspection	N/A	Gap 1	G / Q / U
5	TBL / Five capital accounting in financial process	N/A	Gap 1	G / Q / U
6	Promotion of transparency	N/A	Gap 1	G / Q / U
7	Promotion of local culture	Adopting quality models to local culture are highlighted	Gap 1	Nil
8	Minimise use of natural resources, maximizes use of innovation	The LNR has drawn initial plans on this aspect in line with UNESCO initiatives	Gap 1	Q / U

It is noted that policies and strategies for Libyan higher education need to be drawn based on stakeholder based approaches. Methods of quality evaluation proposed at different levels varied and the need for a robust quality plan and adoption of it to local culture are highlighted. The awareness on environmental issues at government level requires to be translated into action at the university level (Table 5.3).

5.5 Continuous Improvement

In general, continuous improvement implies the ongoing improvement of products, services, or processes through incremental and breakthrough improvements (Hogg and Hogg, 1995). This should be a permanent feature of any organisation and implies that any activity can be incrementally improved at all times (Weideman, 2008). The ISO 9001:2000 standards for generic quality assurance systems prescribe continuous improvement through preventative action, but the focus is customer oriented (Isaksson 2004). But a sustainable success is prescribed based on continuous improvement is related to a stakeholder approach in contrast to the customer oriented approach (Zink, 2007). It the mean the stakeholder approach contrasts the customer approach.

Continuous improvement refers to all efforts that are directed at increased effectiveness and efficiency in meeting accepted customer expectations; it is a continuous process to achieve a better understanding of the market, to innovate products and processes, and to provide service to customers (Fisher and Nair, 2009).

One of the issues raised by Libya in the UNESCO Arab regional conference on higher education reported in the previous section focused on the weaknesses in curriculum development and its unsuitability in time scale (UNESCO, 2009). This is due to inadequate implementation of the continuous improvement principles.

5.5.1 Awareness on Continuous Improvement

As discussed in Section 4.5.2 continuous improvement need to take place at all times, it should address the needs of all stakeholders of higher education and should take place throughout the organisation (Redmond et al., 2008; Taylor, 2003). In his interview response, the Director of Quality Centre in the Ministry of Higher Education Secretariat and the Director of Quality Management stressed the point that continuous improvement should be taken as a core value in all sectors of the higher education institutions:

….The proposed QAQC aims to promote and increase the transparency of educational institutions and develop their ability to improve outcomes and develop the quantity and quality according to standards and rates of economic, social and cultural assessments… This is possible through continuous improvement in all sectors of higher

education, effective leadership… (Directors of Quality Centre in Ministry of Higher Education and Science Research.).

according to the UNESCO (1998) proceedings, quality in higher education is a multidimensional concept should include all the functions of education and activities including the curriculum, programs, research, students, buildings, facilities and tools, providing services to the community, self-learning process, setting standards to international recognition (Director of Quality Management at QAAC).

In the Libyan context curriculum development requires particular attention, in which Libya is lagging behind. This is highlighted by the Director of quality management (Section 5.3.1):

...Developing teaching methods and means of evaluation leading to the continuous improvement of capabilities and skills.... (Director of Quality Management at QAAC...).

In general, it is observed that the need for continuous improvement is appreciated by the Libyan education leaders. However the fact that it should take place at all times and should address the needs of all stakeholders has little reference in the interview responses (Table 5.4). It can be said that frequent power regime changes and revolutions (Section 2.3.2), decentralisation efforts of academic institutions (Section 5.4.1), low pay of teachers. (Section 5.4.2) and participatory attitudes of students (Section 5.6) have affected the continuous improvement processes.

Table 5.4: Awareness, implementation and gaps in continuous improvement related QAPs ,(G – Government, Q – Quality centre, U – University)

No	QAP	Level of awareness / implementation	Gap Identified	Gap visibility levels
1	Employee suggestion	Quality workshops proposed at university level	Gap 4	G
2	Evolution of HR towards best practice	Improvement in working / learning environment suggested. Inclusion of quality tools and techniques curriculum is proposed Lack of specialized staff and inadequate representation of required specializations are highlighted Dependence on teachers from abroad is highlighted.	Gap 3	G / Q
3	Encouraging creativity and innovation	Past studies have indicated that the education system is weak on this point (Section 4.6). Recently the quality centre has drawn a plan and a robust quality plan is not yet available	Gap 1	G
4	Systems and process response to CI	There are remarks about general process improvements but not specific to CI.	Gap 4	G / Q
5	CI of curricula	Quality centre has initiatives on this topic. A gap is non – availability of curricula for the specialized courses. The effectiveness of involving teachers in development of specialized curricula requires evaluation	Gap 2	Nil
6	Constant review of educational outcomes	Requirements are suggested as one of the objectives of the QAQA	Gap 2	G / U
7	Recycling and neutralizing harmful materials	N/A	Gap 1	G / Q / U
8	Promotion of Biodiversity	General awareness	Gap 1	Q / U

5.6 Employee Participation

Employee participation is considered one of the most important principles of (TQM) because of its relationship with customer satisfaction – a principle that is followed by

most TQM models (Ugboro and Obeng, 2000). In addition employee participation can also enhance employee motivation, commitment and job satisfaction, which are in turn linked to quality.

Towards improving the quality of higher education, some countries have developed quality assurance systems, Holmes and McElwee (1995) expressed concerns over such externally imposed quality assurance systems in higher education; according to them this may hamper the productive activity of individuals. This is because they were previously subjected to internal and localized reviews and have to face the challenges of the external evaluation system. Therefore, it can be said that the internally based and self – assessment approaches developed recently are conducive for evaluation of quality in academic institutions (Hides et al., 2004; José Tarí, 2006; EFQM, 2010). The discussions in Section 5.4 point to the fact that both internal and external approaches that are proposed in both Arab and Libyan systems need further scrutiny external scrutiny.

Evaluation can be fruitful in curriculum related aspects as Libya is lagging behind in continuous improvement of curriculum development and it is relying on much out – dated and realised curriculum (Sections 5.4 and 5.5); but for employee related matters self – assessment is favoured, particularly in higher education as it is one of the fast growing method for standards and performance measurement (Zairi, 2005; Section1.2 ; Section 4.4). The EFQM model has frameworks for both external and internal evaluation but most past studies conducted in Europe and Mediterranean regions focused on internal assessment for evaluation in higher education.

Transparency is an important condition for employees to contribute for sustainability (Isaksson, 2004). In part of the larger group of stakeholders such as suppliers, owners, customers, neighbours and the society. Sustainable success to TQM is related to stakeholder approach (Zink, 2007). In the SQM context, students are considered as one of the stakeholders of higher education.

According to Li et al. (2003), Total Quality implies the concept “Total People” meaning involvement of all employees of the organization. This framework; requires quality training being provided for all staff and gathering suggestions from all stakeholders (Section 4.10.4 ; Table 5.5). Towards the understanding of employees on the

requirements of quality, clear policies and strategies need to be drawn; this explains the link between policy and strategy and employee participation (Section 5.4).

Therefore, the importance of employees' involvement in quality policy and strategy is highlighted. Employees also need to be aware of the use of quality control tools such as quality circles or statistical quality control charts (Section 4.2 ; Table 5.5). In addition, employee performance evaluation needs to be clearly guided with recognition and awards.

Table 5.5: Awareness, implementation and gaps in employee participation related QAPs(G – Government, Q – Quality center, U – University)

No	QAP	Level of awareness / implementation	Gap Identified	Gap visibility levels
1	Implementation of quality circles or similar programs	N/A	Gap 2	Q / U
2	Effectiveness of quality circles	N/A	Gap 2	Q / U
3	Employee responsibility to quality	Issues related to social responsibility were discussed at the UNESCO forum	Gap 3	Q / U
4	Feedback to employees on quality	A general opinion in Libya is to involve all concerned in improving quality in a decentralized manner	Gap 4	U
5	Quality awareness among employees	There is a general concern about quality enhancement; The quality centre and universities have programmes for quality education at the university level.	Gap 1	Nil
6	Supervisor's participation in quality	Involving everybody in quality matters is presented	Gap 3	G / Q
7	Provision of high standard of health to all	N/A	Gap 1	G / Q / U
8	Scope for learning and innovation	Past studies have shown that encouragement for innovation is lacking in general education	Gap 2	G / Q / U
9	Availability of social justice to all	Concerns about this expressed but a framework is not yet available	Gap 1	Q / U
10	Safe working environment	N/A	Gap 1	G / Q / U

The observations made by Libyan respondents on the QAPs pertaining to Employee participation include involvement of all in quality. (Director of Quality in the Faculty of Medicine at the University of Gharyan.), *bringing awareness through benefits of quality itself* (Director of Quality in the Faculty of Medicine at the University of Gharyan.). However, it is noted that awareness about tools and techniques of quality and sustainability related QAPs is lacking (Section 4.2 ; Table 5.5).

5.6.1 Students' Participation

Students' participation can also be compared to that of employees. The participatory attitudes of Libyan students are a major concern (Alhmali, 2007). Students often show their dissatisfaction by leaving school or failing to attend the classes. Alhmali (2007) suggested that these attitudes are influenced by the following factors:

1. Examinations are based on memorisation and recall; students have little chance to think reflect and apply creative ideas. Often students expressed their fear about examinations.
2. Teacher shortages that reduce the opportunity in classroom interactions. This is combined to resources shortages (Section 5.4.1 and 5.4.2).
3. Lack of insight of the teachers in their subject.
4. The objective of education is oriented towards career and examination passing; understanding and critical thinking are devalued. This attitude is prominent for the case of science subjects such as mathematics, physics and chemistry.
5. Enhancing the participation of students would require removal these barriers.

5.7 Customer Focus

Crosby defined quality as conformance to customer requirements (Crosby, 1979). Customer focus describes how the company determines the longer - term requirements, expectations and preferences of customers and markets (Li et al., 2003). TQM is generally understood as a system that embraces all activities to meet the needs and the expectations of the customers (Zink, 2007). Some past studies have suggested that developing countries the acceptance of this notion is slow (Isaksson2004; Karsten and Pennink, 2007). In the EFQM model 'Customer Results' is considered as a first level design criteria (EFQM, 2010).

The approach used by the ISO 9001: 2000 quality standards is based on the principles of understanding and meeting customer requirements. In this context the objectives defined, services provided, processes involved and structure and size of the organization

are evaluated for quality awards (Weideman, 2008). One of the major focuses of the ISO system is to link process management to quality (Zink, 2007).

5.7.1 SQM: Customer Focus and Stakeholder Balance

The traditional approach to TQM focused prominently on customers without considering the broader environmental issues. It is noted that that customer focus is a common criteria in both TQM and EFQM models (Isaksson 2004). The fact that customers also have future generations strengthens the focus on sustainability and Isaksson (2004) argued that focusing only on customers can lead to weak sustainability (Section 4.10.5). In the context of higher education, Weideman (2008) further added that customers of higher education can include students, employers, parents, associated businesses, local, regional and national agencies involved and research-funding bodies (Weideman, 2008).

With a focus shift from customers to stakeholders the number of persons and groups concerned has increased. For example, in ISO 9000 the term "interested party" is used for "person or group having an interest in the performance or success of an organization" and the examples given are: customers, owners, and people in organizations, suppliers, bankers, unions, partners or society. The 'Total People' concept discussed in the previous Section supports the idea of integrating all people involved in the organisation towards sustainability. Such an integrated approach is aimed at responsible environmental behavior from Organisation in the developed countries (Isaksson, 2004). Therefore, in the context of SQM, it is an important concept and it includes "Corporate Social Responsibility" a principle that evolved from TBL approaches to sustainability.

5.7.2 Student Requirements

The Director of Quality Management and the Director of quality in Faculty of medicine, Gharyan University were emphasizing on the need for student focus in quality management:

…Reviewing standards and procedures for evaluating and identifying the needs of Students (programs and specializations) ... (Director of Quality Management at QAAC).

… One of the benefits of quality is … Improvement in educational services to Students (Director of Quality in the Faculty of Medicine at the University of Gharyan.)

However, these interview responses do not indicate the mechanism through which student feedback is obtained on their requirements, which is one of the QAPs listed in Table 5.6. Again, an important related issue is the promotion of student feedback. The discussion in Section 5.6.1 points to the fact that student's interaction with the teacher is limited due to teacher shortages; such an environment is considered less conducive for obtaining effective feedback from students. Another important aspect highlighted in student requirement is the promotion of innovative thinking as opposed to memorization and recall in examinations and this is also required to be incorporated in the context of quality (Section 5.6.1).

The demographics of Libya presented in this section 2.4 include a variety of foreign nationals and students with various cultural backgrounds; hence the student diversity needs to be taken into account while attending to quality enhancement programs. The Secretary of Ministry of Higher Education and Science Research pointed out:

…the demographics of Libyan students vary with respect to age, sex, skills and cultural backgrounds. These days more than 50% are female students (Secretary of Higher Education and Science Research).

However, discussions presented in Sections 2.3.1 and 2.4.4 reveal that the quantum of diversity (Table 2.2), due to culture is minimal, as more than 90% of the population belongs to Sunny Muslims. However, the requirements of female students who constitute more than 50% of the students can be considered a matter of importance in diversity. The fact that female students are not allowed to communicate with the opposite sex can affect quality due to communication related issues and requires further attention (Section2.4.4).

5.7.3 Can Private Universities Enhance Customer Focus in Libya?

According to Li et al. (2003) privately owned enterprises performed better in TQM implementation in China. The difference in performance is noted mainly due to improvements in the areas of leadership and supplier quality management in the private

sector when compared to state owned enterprises. The Third Universal Theory discussed in Section 5.4.3 , advocates privatization only or to a minimal extent in the past (Section 2.4.3); hence, during the early phases, the Libyan government owned most educational institutions (Section 2.5.4). However, during the last few years, a shift in the policy is observed and a few private universities have been started. The Secretary of Higher Education expressed his opinion that customer focus in a competitive educational environment is understood by the need for private sector participation, particularly in the globalized environment.

...after globalisation competition has increased and the students have multiple options on the type of institution they wish to attend. But globalisation has weakened the government-based education and increased the importance of privatisation (Secretary of Higher Education and Science Research).

This view is also supported by the Director of the Quality Centre:

...encourage the spirit of competition among educational institutions to ensure the quality of the educational process and outputs ... (Directors of Quality Centre in Ministry of Higher Education and Science Research).

The fact that TQM is often visualized as a system that leads to a competitive advantage in commercial business acknowledges both the arguments presented above. This can be possible in a community oriented to Market Culture discussed in (Section 4.10.9 , which believes in competitive ideals. But in the context of sustainability and a family oriented "Clan Culture" present in Libya, the win – lose competition itself is under – valued because people of preferring trust, creativity and cooperation to competition. The concept that privatization will improve customer focus and competition is viewed with skepticism, because many private enterprises were also found to be weak in implementing quality training which is another important Critical Success Factor (Li et al., 2003; Section 5.9). To overcome such defects, the Libyan government is also considering joint – venture approaches involving both public and private sectors in higher education (Section2.5.4).

In summary, customer focus in higher education favours the stakeholder approach that is also complementary to the larger and broader for encouraging the spirit of competition among educational institutions to ensure the quality of the educational process and outputs (Directors of Quality Centre in Ministry of Higher Education and

Science Research). The framework of SQM proposed. It is noted that a robust framework for student requirements and their feedback is not yet available in the Libyan higher education system (Table 5.6).

Table 5.6: Awareness, implementation and gaps in customer focus related QAPs

(G – Government, Q – Quality Centre, U – University)

No	QAP	Level of awareness / implementation	Gap identified	Gap visibility levels
1	Student requirements designed into quality	N/A	Gap 1	G / Q / U
2	Promotion of student feedback	N/A	Gap 4	G / Q / U
3	Positive values and community development	In accordance with the global initiatives, the LNR has outlined a plan for this	Gap 1	U

5.8 Process Management

A process is a sequence of activities performed towards achieving a goal or result

(Thompson and Martin, 2010). According to the Baldrige National Quality Programmer, process management assesses the key processes, work systems and designs; this is undertaken with a view to improving key processes and work systems to achieve desired organizational goals (Weideman, 2008). The Malcolm Baldrige National Quality Award (MBNQA) and EFQM consider process management as one of the major criteria for business excellence (Brookes and Becket, 2007; EFQM, 2010). As discussed in Section 5.7 the ISO quality systems are oriented towards prevention through process management. Organisations need to translate customer requirements into a set of process specifications (Thompson and Martin, 2010). Making this translation requires substantial research and development through using the knowledge and experience of the people involved. For example, in a manufacturing unit initially engineers come up with a product design that is based on customer requirements. This is followed by process a specification that is based on the equipment, tools and facilities used towards production operations.

So in between product design and production operations translation of customer requirements into processes take place. However unpredictable variations in the

production processes are inevitable (Thompson and Martin, 2010). To overcome these unexpected variations, research and development are required using the knowledge and the experience of the people involved. So process management practices lead to better quality through incremental and innovative improvements (Zairi, 2002). In simple terms, TQM can be defined as the continuous improvement of inputs - processes - outputs (Isaksson 2004). Similarly, processes can be seen as the central core, through which people work and produce better performance; this leads to the notion "people – process – performance" (Steed et al., 2005).

The technical issues of TQM requires improve production methods and operations through established and well-defined processes towards continuous improvement of goods and services to customers; in the EFQM model a similar principle is described based on the notion that excellent organisations design, manage and improve processes to satisfy customers and other stakeholders (Bou-Llusar et al., 2009). In this context, all the criteria of enablers in the EFQM model embrace processes.

Processes can be systematically designed, managed and improved through innovation with a view to satisfying and creating value for the customers. Past benchmarking evidence suggest that best practices in excellent organisations include (Steed et al., 2005):

1. A clear business process methodology
2. Mapping all critical and support processes
3. Reviewing critical processes annually and defining them with customer orientation
4. Clear definitions of inputs, outputs and processes
5. Process linkages to business objectives
6. Developing process models and assigning a manager to each process

Process design can be based on competing and non–competing organizations. For example, the Xerox Company benchmarked 200 processes from non–competing organizations and incorporated them into its processes (Thompson and Martin, 2010).

At present many universities follow a hierarchical or vertical structure in their organisation that hampers communication and co – operation among the employees

(Thompson and Martin, 2010; Steed et al., 2005). This is due to the limiting values imposed by hierarchy and bureaucracy. Therefore, a transformation from hierarchical thinking to process thinking is required. A processing structure can cut through various academic, administrative departments and has the potential to break down the barriers between the departments and lead to better communication and co – operation among them. For example, the case of a manufacturing unit discussed above the design department has to coordinate with production department and production department has to coordinate with shipping department. These horizontal cross - functions are can be better achieved through process definitions (Thompson and Martin, 2010). It can be said that horizontal cross functions are particularly important for academic institutions as the number of departments are many and diverse. This aspect is particularly important for the educational institutions of the Arab region and Libya where hierarchical structures are still prevalent (4.5).

According to Garvare and Isaksson (2001) sustainability can be seen as a high level process of reaching a steady state where both humanity and nature co – exist. Therefore, the Sustainable Quality Management (SQM) processes are required to be designed at both organizational and societal levels (Section 4.8). Integration of all such SQM processes have become increasingly complex due to the totality of environmental aspects involved (Zairi, 2002).

The Critical Success Factors leadership and policy and strategy discussed in Section 5.3 and 5.4 are also linked to processes in the sense that the vision, design and plan of an organization need to be successfully translated into processes For example if the leadership draws a decision to neutralize all harmful materials that can lead to a set of activities (or processes) such as (1) identify harmful materials (2) classify them according to neutralising characteristics (3) Acquire neutralising agents (4) Neutralisation and disposal.

The present level of process management and benchmarking tools used is limited both in the Arab and Libyan industrial contexts (Youssef, 2006). However the Libyan National Report has highlighted the need for defining values of the education system and translating these values into processes (GSPLAJ, 2008). For example, the value that education needs to be free for all has been translated and implemented throughout the

country (Section 2.5.4). Although this indicates process orientation of top leadership of Libya further details on the structure of processes involved is unavailable in the report.

The preceding discussion shows that it requires substantial improvements in process management in Libyan higher education sector. This is particularly important because of its potential towards horizontal functioning across departments.

Table 5.7:Awareness, implementation and gaps in process management related QAPs(G – Government, Q – Quality centre, U – University)

No	QAP	Level of awareness / implementation	Gap identified	Gap visibility levels
1	To what extent the processes are identified to cut barriers across departments?	Although the hierarchical structure is predominant in Libyan higher education a process orientation is prevalent to some extent in the universities.	Gap 1	G / Q
2	Reviewing education standards based on sampling	N/A	Gap 1	G / Q / U
3	Use of statistical process controls charts	N/A	Gap 1	G / Q / U
4	Equipment / facilities maintenance	N/A	Gap 2	G / Q / U
5	Stability of programs (Academic / Research / Administration)	There are descriptions and follow-up activities	Gap 2	G
6	Automation of processes	To some extent IT applications are used	Gap 2	Nil
7	Programs for natural resources development and environmental conservation processes	A general outline has been included in the plan	Gap 1	U

5.9 Training Program

Training is defined as the planned systematic development of knowledge, understanding, skills, attitudes and behaviour patterns towards the adequate performance of a given task (Oakland, 2003b). According to Crosby defects in quality arise due to two factors; lack of knowledge and lack of attention (Crosby, 1979).

Therefore, organisations should adopt modern methods of quality training (Crosby, 1979; Deming, 1986). Quality oriented training requirements can be seen in two perspectives; firstly the need for adequate knowledge and skills towards customer satisfaction and secondly training pertaining to an understanding of the quality tools. Lack of training can result in ambiguity in service provided and low morale among employees (Weideman, 2008).

Therefore, the quality movement depends considerably on the standards of education and training provided to the employees. During the initial stages of TQM, evolution focus was laid on training (Van der Wiele and Brown, 2002). Many organizations allocate significant resources for training through an internal quality department. The ISO 9000 and 14000 quality systems incorporate specific standards on education and training (Hoyle, 2009). And training on TQM tools provided to supervisors and middle managers in business process management has improved the performance results in developing environments in Africa (Isaksson and Wiklund, 2001). However the time required for such training was found to be more than for developed economies (Isaksson and Wiklund, 2001).

This is also supported by the findings of Karsten and Pennink (2007) highlighting illiteracy level in some African companies. Although Libya is in Africa, and its leaders and employees in various industries are enthusiastic about quality improvement, they too lack the knowledge and the know-how to implement quality initiatives; this is because most of them did not attend any training programs and only a small group of middle-level employees attend the ISO 9000 quality training (Youssef, 2006). Because of this, they could not understand many of the quality tools and techniques involved. The above-mentioned results obtained from African countries incorporated for the case Libyan quality training initiatives (UNDP, 2005). It also highlighted the need for co-ordination between academics and training consultants. Based on UNESCO's initiatives some Arab nations have initiated quality assurance training institutions (UNESCO, 2009). However, such a training institution is yet to be established in Libya.

Libya has adopted a policy to provide training to graduates in specialized courses with a view to supporting specialized teaching requirements in secondary schools. Advanced studies within Libya are limited to major disciplines only and for the case of specialisations students need to go abroad. The objective is to educate for basic needs

and the local labour market. Like most Arabic countries, Libya also teaches technical subjects in the Arabic language.

Studies have shown that often the Arabised course material is not updated as most teaching staff is not conversant with English; hence special training programs are recommended in technical English for both staff and students (UNDP, 2005).

Table 5.8: Awareness, implementation and gaps in training related QAPs (G – Government, Q – Quality centre, U – University)

No	QAP	Level of awareness / implementation	Gap identified	Gap visibility levels
1	Advancing faculty qualifications	There are exclusive education centres for this. In the recent years many faculty members are sent to USA and UK for higher degrees (Section 3.5 and 4.4)	Gap 3	Nil
2	Training on statistical quality controls	N/A	Gap 3	G / Q / U
3	Training on quality circles	N/A	Gap 3	G / Q / U
4	Training on TQM	The quality centre and universities have concept orientation.	Gap 3	Q / U

5.10 Gap summary

The gap instances evaluated in Table 5.2 to Table 5.8 are summarized in Table 5.9 and sub–totalled as the following inferences are drawn from:

Policy and strategy, leadership and process management show a large number of gap instances.

Gap 1 is the largest in number followed by Gap 3.

It is noted that the number of instances at the government level is 26 followed by the quality centre level at 24 and university level at 22. But it can be said that specifics are not usually worked at the government level. But even for certain fundamental issues level of for example transparency, administrative and financial freedom government level declarations are unavailable. However, with a view to studying these gaps in SQM implemented in the Libyan Higher Education system, available policy documents and an interview with Libyan experts were collected at the government level, quality centre

level, and University level. Therefore, the results presented in Table 5.9 showed that there is considerable awareness at the University level on various aspects of SQM. But there are many gaps noticed at the government and quality centre levels. A list of gaps was presented with reference to the 72 QAP related to 8 CSFs chosen for the evaluation of Deming PDSA model. Interestingly, many of the interviews have proposed sustainability based QAPs even though on this aspect was explicitly mentioned.

It is proposed to design the methods used in PDSA and EFQM models based on the CSFs, gaps and levels identified through this empirical study cross type of gaps, CSFs, and level of the Libyan higher educational organizations.

Table 5.9: Summary of gap instances evaluated through Table 5.2 to Table 5.8

CSF	Number of QAP gap instances visible from Table 4.2 to 4.8															Total
	Gap 1			Gap 2			Gap 3			Gap 4			Gap 5			
	G	Q	U	G	Q	U	G	Q	U	G	Q	U	G	Q	U	
Leadership	3	3	1	-	-	-	4	2	1	-	-	-	-	-	-	14
Policy and Strategy	5	6	6	-	-	-	-	-	-	-	-	-	-	-	-	17
Continuous Improvement	1			-	-	-	1	1	-	2	1	-	-	-	-	6
Employee Participation	-	-	-		2	2	-	1	1	-	-	1	-	-	-	7
Customer Focus	1	1	2	-	-	-	-	-	-	1	1	1	-	-	-	7
Process Management	3	3	3	2	1	1	-	-	-	-	-	-	-	-	-	13
Training	-	-	-	-	-	-	3	2	3	-	-	-	-	-	-	8
Level wise total	13	13	12	2	3	3	8	6	5	3	2	2	0	0	0	-
Gap wise total	38			8			19			7			0			72

5.11 Summary of Chapter Five

This chapter began with a discussion on the gaps between rhetoric and reality in TQM implementation. The importance of understanding these gaps is particularly important for developing a quality framework for the Libyan system. Conclusions drawn for each of the CSFs are summarized below:

Both quality and sustainability models stress the importance of leadership as a major criterion; the frameworks of Deming PDSA and the EFQM models highlight the significance of leadership and desirable qualities of leaders have been discussed. While

the present commitment of top leadership towards education is appreciated, the UNESCO and other past studies have identified some areas for improvement in higher education leadership both in Arab nations and Libya. The top leadership has outlined some plans oriented towards the environment and sustainability.

The policies and strategies of the Libyan system are influenced by its fundamental views such as free education for all. Studies have shown that the past policies have helped to achieve increased enrolment. Recently, comprehensive quality plans have been developed at government and quality centre levels, but some studies have shown that implementation of such plans is inadequate. In addition, there is some ambiguity on the use internal and external evaluation methods at various levels of the system. With reference to SQM the LNR has drawn some plans in tune with the global initiatives.

A general awareness of continuous improvement as a means to quality is perceived by the concerned at the quality centre and university levels. Libya lags behind with reference to the continuous improvement of higher education curriculum. While the involvement of all in quality is highlighted, the students' attitude was found to be a major concern due to lack of encouragement of innovation in learning the process. Use of tools such as quality circles in evaluation has not been reported.

With a focus of shift from customers to stakeholders in the context of SQM, the number of groups involved in higher education has increased. The privatisation of higher education in Libya is perceived as an effort to improve customer focus. However, a robust student feedback system is yet to be evolved.

The present level of process management and benchmarking tools used is limited both in the Arab and Libyan higher education system. It was observed that processes could transform the limiting values imposed by the hierarchy by cutting through the barriers across the departments. There is a general awareness of the need for quality training in Libya. Except a few in the middle management, most Libyan employees at the top and bottom levels do not undergo adequate quality training. It is noted that training is an important first step in the Libyan context.

Gap 1 and Gap 3 appear to dominate the Libyan higher education system at various strengths across the seven CSFs. Results obtained from these analyses are presented and discussed in the next chapter.

Chapter 6 Quality, Sustainability, and Actuality: Perceptions of The Libyan Stakeholders - Part I

6.1 Introduction

The aim of this chapter is to present the findings of quantitative data gathered through the questionnaire survey and to relate these results to the findings of exploratory literature survey and the semi – structured interviews. Out of the eight Critical Success Factors (CSFs) chosen for this study, discussion and findings pertaining to four CSFs are presented in this chapter; these include Leadership, Policy and Strategy, Continuous Improvement and People Focus. Broadly, various methods followed within these domains of quantitative and qualitative data focussed on verification and validation through the data and methodological triangulation described in this Section 3.8 It is recalled here that this study followed a sequential exploratory design that included mixed methods analysis of quantitative and qualitative data (Creswell, 2013); the research process include:

1) Identification of outlier issues of statistical test results of quantitative data and their validation through interview responses
2) Verification of statistically significant differences in the perceptions of various groups with qualitative data
3) Comparison of high and low observations on various Quality Action Programmes (QAPs) and exploring reasons through other types of data gathered.
4) Discussion on the themes identified from quantitative results
5) Discussion on the themes identified from qualitative results
6) Correlation of categories
7) Classification and quantification of qualitative data

The quantitative was based on the statistical analysis of the questionnaire responses. In addition, these were also used for an analytical approach that linked the quality consciousness of Libyan internal stakeholders with the Sustainability Index (SI). In

general, the application of all these techniques explored answers to the research questions presented in the Methodology chapter that was designed to evaluate the level of sustainable quality oriented action programmes observed under different situations within the higher education system in Libya. Towards this, the background information gathered on respondents were arranged in six categories including the institution they belonged to, faculty of specialization, qualification, age, gender and location of work. Each of these categories was further divided into between two and nine groups as shown in Table 6.1. In all, 26 groups were classified under the six categories mentioned above. As described in sections 3.9 and 3.10 of the methodology chapter, the questionnaire data were collected on 72 questions which spanned over 8 Critical Success Factors (CSFs). A total of 678 responses were obtained and analysed. The variations in the respondents background information and their experiences, expertise and viewpoints supported the evaluation of SQM issues within the Libyan Higher Education context

In this chapter, an account of interpreting the statistical test results is presented in section 6.2 followed by a description of the background information about various groups presented in section 6.3 . From section 6.4 to 6.7 results and findings from a combined quantitative and qualitative data analysis is presented for the four CSFs as follows: 6.4 – Leadership, 6.5 – Policy and Strategy, 6.6 – Continuous Improvement, 6.7 – People focus; section 6.8 summarises this chapter.

6.2 Explanation of Statistical Tests

The Kruskal-Wallis Statistic 'H' measures how much the group ranks differ from the average rank of all groups for the case of several independent samples; the Mann Whitney Statistic 'U' is a similar parameter for two independent samples (Section 3.12 (Jakobsson, 2004). Both these test results can be seen in two perspectives: (a) The Kruskal Wallis Mean Rank (KWMR) or the Mann Whitney Mean Rank (MWMR) is considered as a measure of central tendency that indicates how each group has observed the implementation of a given Quality Action Programme (QAP) depicted by the question in their work or study environment; a higher value of KWMR or MWMR implies a higher level of observation of a given QAP and vice–versa. (b) The computed 'H' and 'U' values (or computed Chi square values) were compared with the Chi square values in standard statistical tables that correspond to a certain degree of freedom for

each test. If the computed Chi square value is greater than the tabulated value for a given probability level 'p', then the Null hypothesis, in that case is rejected. The Null and alternate hypotheses for the present study are:

The null hypothesis (H0) = There is no significant difference in observation among the groups of a given category at the level of probability indicated by the 'p' value

Alternate Hypothesis (HA) = There is a significant difference in observation among the groups of a given category at the level of probability indicated by the 'p' value

The 'p' values indicated in various tables of this chapter are the probability levels at which Null hypothesis is rejected (see for example Table 6.2). A 0.05 'p' value is considered significant in the present study. Rejection of Null hypothesis at these levels implies that the Alternate hypothesis is accepted, which means there exists significant differences among the observations of various groups studied. For example in Table 6.2 for the question LD1 'p' values are greater than 0.05 across all groups; on the other hand, the 'p' values in the case of LD2 is less than or equal to .005. This leads to the inference that the observation of the various groups in the case of LD1 are not significantly different (Null hypothesis is accepted) and in the case of LD2 the observation of the various groups is significantly different.

Various tables and charts of this chapter also present high and low scores of KWMR or MWMR under a particular category (see for example Table 6.2 and Figure 6.1); these high or low values denote the highest or lowest value scored among the groups of a category for a given question. For example, the high KWMR value shown for the case of LD1 under institution category is 355.2 that were scored by ACGU – the Academic group of Gharyan University (Table 6.2).

Table 6.1: Details of categories, group identification codes (Group IDs), description and number of respondents involved in the study

Category	Group ID	Description	Number of Respondents
INSTITUTION	ACTU	Academic Staff, Tripoli	293
	ACGU	Academic Staff, Gharyan	241
	NAQC	Non - Academic Staff, Quality	27
	NAHE	Non - Academic Staff, HE	23
	STU	Students	94
Total			678
FACULTY	ARTS	Arts	76
	DENT	Dentistry	30
	ECON	Economics	75
	EDU	Education	75
	ENGG	Engineering	60
	LAW	Law	72
	MED	Medicine	37
	PHAR	Pharmacy	40
	SCI	Science	69
Total			534
QUALIFICATION	DOC	Doctorate	242
	MAS	Post – Graduate	235
	OTH	Others	201
Total			678
AGE	YO	Young: 20 to < 30 years	108
	MID1	Middle Age 1: 30 to < 40 years	314
	MID2	Middle Age 2: 40 to < 50 years	195
	SEN1	Senior 1: 50 to < 60 years	58
	SEN2	Senior 2: > 60 years	3
Total			678
GENDER	M	Male	474
	F	Female	204
Total			678
LOCATION	TRIP	Tripoli	392
	GHAR	Gharyan	286
Total			678

The last two columns of Table 6.2 present Group Averages for a given for Quality Action Program QAPs (GAQ), its rank within the CSF and SI value of the QAP (Section 6.1). While the GAQ rank is a measure used for comparing the performance of a QAP within the CSF, the SI indicates how far a QAP is sustainable within the higher education system (section 3.13). SI values above 0.5 are considered to indicate a high level of sustainability, 0.4 – 0.5 are considered to indicate the medium level of sustainability and less than 0.4 is considered to indicate a low level of sustainability (Section 3.11.3

It is recalled here that some semi – structured interview questions were designed to be addressed to the Libyan higher education experts, so that they could express their awareness on various SQM QAPs based on their knowledge and experience. These responses were documented subject to a keyword content analysis (Section 3.10 These words were selected from the literature review and previous case studies related to Quality and sustainability issues; they were then presented as QAPs and were incorporated in questionnaire and semi- structured interview for respondents. Based on these tables were prepared on each keyword frequency of occurrence under each CSF and these results were used to infer the level of awareness of Libyan experts.

6.3 Background Information on Various Groups

The background knowledge, experience and the field of specialisation of various groups are considered while analysing their responses to various SQM issues of the study. Among the institutional groups three are academically oriented, the teaching and research staff at Tripoli and Gharyan university and students (Table 6.1); hence their response to the questions are expected to be academically focused. This is in contrast to the non – academic groups at the Quality Centre and Higher Education Secretariat middle and senior level management staffs who are more involved in the implementation of higher education quality practices and these respondents are considered more qualified and experienced in education quality matters.

The nine faculty groups listed in Table 6.1 specialise in different fields of study. It is possible that their observations on various issues have been influenced by their specialisation, their evolution in the quality process. For example, respondents with a biological background may recognise the importance of biodiversity on which a question is asked under continuous improvement CSF (item CI10 in Table 6.7).

Therefore, when a biologist observes on biodiversity in his work environment she may view that subject more critically than other subject matter specialists. The end result may lead to a low score awarded by the biologist when compared to other specialists. To reduce the bias due to this subject oriented reasoning, data was also gathered during the semi – structured interview as the respondents was asked similar questions although they belonged to different faculties and departments. Similarly,, responses pertaining to other groups were also analysed by comparing responses using the various mixed methods techniques listed in the section 6.1

6.4 Leadership

In section 5.3 a review on this CSF is presented and it is emphasised that in the higher education sector, the influence of the leadership depends on its relationship with staff and various sub – systems of the organisation (Osseo-Asare, 2004). These relationships are grouped into leadership involvement, commitment and awareness and the QAPs listed in Table 6.2 relating to these aspects are LD1, LD2, LD4, LD5, LD6, and LD7. Apart from these six QAPs three additional QAPs studied under this CSF deal with the implementation of management systems, ability to take timely decisions and inspiring people of the organisation. In all, nine QAPs were studied as listed in Table 6.2. Statistical test results pertaining to these QAPs are presented in Table 6.2, Table 6.3 and Figure 6.1. Among this Table 6.2 presents the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by Group Average of a QAP (GAQ), rank of the GAQ within the leadership CSF and Sustainability Index (SI). Table 6.3 presents the Mann Whitney statistics for gender and location groups (two groups each). Table 6.4 presents results of keyword's content analysis pertaining to leadership QAPs. Figure 6.1 summarises Table 6.2 and Table 6.3 by showing groups that have scored high or low for a largest number of QAPs.

6.4.1 Leadership Involvement, Commitment to SQM Issues

Two QAPs relate to leadership involvement, the first deals with leadership involvement with the purpose, direction and culture of the organisation (LD1) and the second stresses the importance of leadership involvement with the customers, suppliers and society in developing partnerships (LD2). The GAQ rank of these QAPs is nine, which

implies that its visibility is the lowest among all leadership QAPs that is also combined with a low sustainability index value (Table 6.2). The above-mentioned observations reveal that the leadership involvement is limited on these action programmes and the word “supplier” has shown zero occurrences in Table 6.4 supports this inference that there is significant between various groups. Interview responses presented in Box 6.4.1 suggest that lack of quality orientation the selection criteria followed in appointing the senior higher education leaders, centralised decision making in appointing higher education leadership are contributing factors for this trend in the Libyan higher education institutions. A further comparison of interview responses showed that the senior leaders of the Libyan higher education system inadequately represented the EFQM leadership design criteria Box 6.4.1

Table 6.2: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Leadership CSF.(* indicates p <= 0.05 and ** indicates p<= 0.005) Leadership (LD)

QAP No.	CATEGORY	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p		
		High	**Low**		**High**	**Low**		**High**	**Low**		**High**	**Low**			
LD1	Leadership involvement in the development of a strategic statement about the purpose, direction , and culture of the organization is high	ACGU 355.2	NAHE 306.0	0.347	DENT 330.0	SCI 229.1	0.023	MAS 348.7	DOC 333.9	.604	MID2 347.9	SEN1 234.0	.600	1.73 / 9	0.347
LD2	Leadership involvement with customers, suppliers and society, towards promoting partnerships & improvements is high	NAHE 387.5	ACGU 297.5	**0.000**	DENT 343.4	PHAR 210.4	**.000****	MAS 363.7	DOC 304.3	.001**	MID1 366.6	SEN1 152.0	**.000****	2.18 / 5	0.458
LD3	Senior management implements quality management systems that improve organizational performance	STU 355.0	NAQC 318.5	0.849	DENT 320.1	ECON 229.0	.013	MAS 351.3	OTH 319.4	.146	MID2 361.8	SEN1 197.3	.150	1.91 / 8	0.387
LD4	The leadership has shown a high level of commitment to continuous improvement	ACTU 362.7	ACGU 307.3	0.012*	DENT 345.4	PHAR 235.1	.007*	MAS 367.8	DOC 317.8	NA	MID1 363.9	SEN1 50.5	.002**	2.50 / 1	0.507
LD5	The extent of the leadership commitment to quality training of stakeholders in order to improve their awareness on quality is high	ACTU 372.6	NAHE 258.3	**0.000**	ECON 335.8	EDU 240.8	.072*	MAS 357.9	DOC 326.9	.143	MID1 351.9	SEN1 192.5	.103	2.33 / 4	0.463
LD6	Leadership awareness of natural resources and biodiversity s high	NAHE 404.6	ACTU 333.7	0.335	PHAR 291.5	MED 234.3	.783	MAS 361.6	DOC 218.9	.035*	MID1 353.2	SEN1 63.0	.022*	2.18 / 6	0.460
LD7	Leadership awareness of social and ethical justice is high	NAQC 406.1	STU 305.8	0.103	LAW 310.6	MED 195.1	.011*	MAS 353.1	OTH 328.8	.322	MID1 346.2	SEN1 263.8	.696	2.02 / 7	0.423
LD8	Managers' ability to make sound and timely decisions, based on information, experience and impact is high	ACTU 367.4	ACGU 304.5	**0.002**	DENT 357.1	EDU 232.1	.010*	MAS 343.9	DOC 321.8	.133	MID1 353.7	SEN1 275.5	.071	2.33 / 3	0.472
LD9	The ability of leadership to inspire people towards a culture of involvement in, and ownership of, high quality education is high	ACTU 378.1	NAHE 265.9	**0.000**	DENT 334.3	EDU 214.2	.002**	MAS 363.9	DOC 301.6	**.000****	YO 366.3	SEN2 266.8	.004**	2.38 /2	0.472

Table 6.3: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under Leadership CSF, (* indicates p <= 0.05 and ** indicates p<= 0.005)

QAP No.	CATEGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		p
		High	**Low**		**High**	**Low**	
LD1	Leadership involvement in the development of a strategic statement about the purpose, direction , and culture of the organization is high	M 344.9	F 326.9	.218	GHAR 343.0	TRIP 337.0	.0657
LD2	Leadership involvement with customers, suppliers and society, towards promoting partnerships & improvements is high	M 341.3	F 335.3	.691	TRIP 364.0	GHAR 306.0	**.000****
LD3	Senior management implements quality management systems that improve organizational performance	M 348.4	F 318.7	**.**045****	TRIP 341.0	GHAR 337.6	.810
LD4	The leadership has shown a high level of commitment to continuous improvement	M 343.7	F 329.8	.374	TRIP 357.5	GHAR 314.9	**.003****
LD5	The leadership commitment to quality training of stakeholders in order to improve their awareness on quality is high	F 340.7	M 339.0	.912	TRIP 366.7	GHAR 302.2	**.000****
LD6	Leadership awareness of natural resources and biodiversity is high	F 359.3	M 331.0	.060	TRIP 343.3	GHAR 334.3	.522
LD7	Leadership awareness of social and ethical justice is high	F 359.6	M 330.8	.052	TRIP 346.6	GHAR 329.8	.224
LD8	Managers' ability to make sound and timely decisions, based on information, experience and impact is high	F 349.0	M 335.4	.373	TRIP 361.1	GHAR 310.3	**.000****
LD9	The ability of leadership to inspire people towards a culture of involvement in, and ownership of, high quality education is high	F 361.5	M 330.1	.041*	TRIP 365.2	GHAR 304.3	**.000****

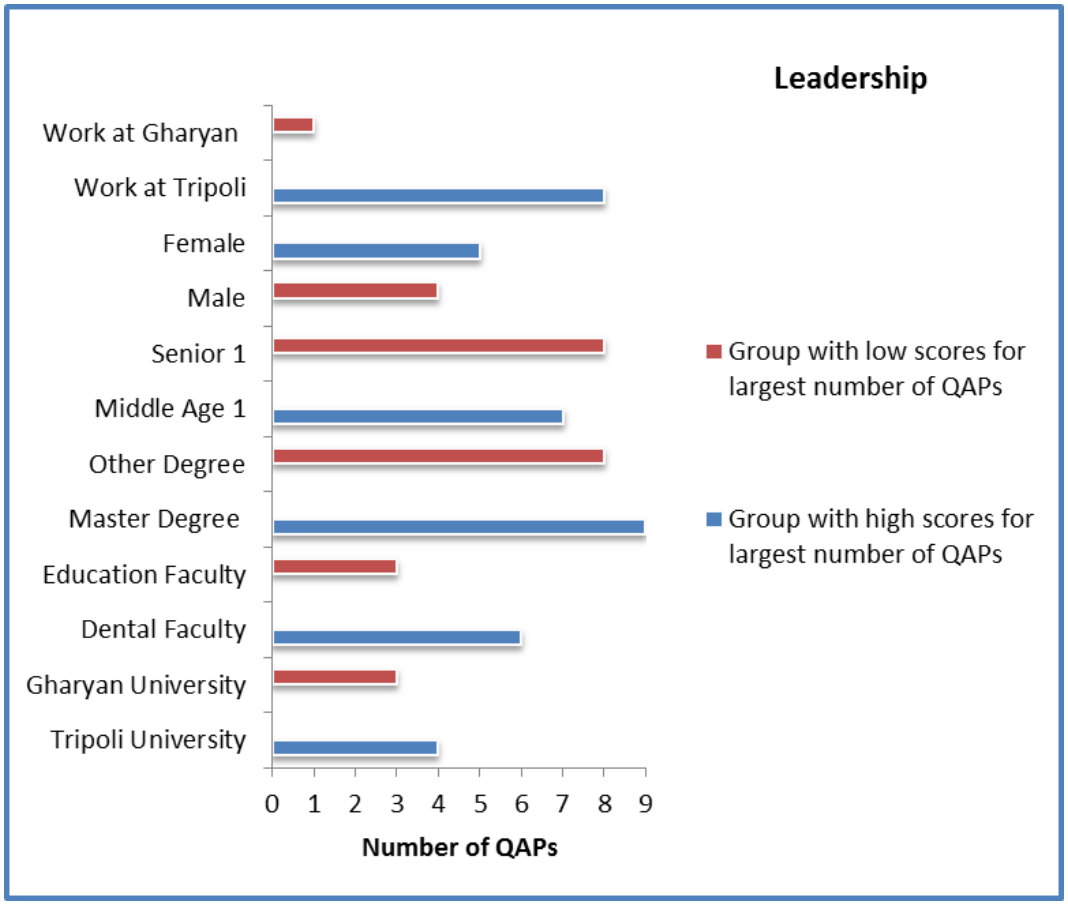

Figure 6.1: largest number of QAPs for which different groups have scored high or low KWMR (or MWMR) under Leadership CSF (from Tables 6.2 & 2.3)

Table 6.4: Keyword content of responses gathered for indirect questions of semi – structured interviews under leadership CSF (Tables 6.2, 6.3 & section 6.2)

Keyword	Linked to QAP	Number of occurrences	Awareness level
social, society	LD7 , PF1	37	Above average
Training	LD5	29	Above average
Culture	LD1, PS7	27	Above average
continuous Improvement	LD4 , CI4	10	Below average
Justice	LD7	10	Below average
Customer	LD2, CF5	7	Below average
Natural	LD6 , PS8	7	Below average
ethic, ethical	LD7 , PS5	5	Below average
Biodiversity	LD6, CI10	4	Below average
Supplier	LD2	0	Lacking
		Average = 13.6	

*Leadership (LD)

Tripoli University has scored high KWMR for four QAPs; these include: leadership commitment to continuous improvement, quality training, sound and timely decisions of the leadership and creation of a culture of involvement among the stakeholders. In most cases KWMR results are low for Gharyan University. Tripoli University has been a mainstream academic institution for a long time and is reputed for its quality orientation to academic activities (section2.6). The education quality management staffs of this university have collaborative activities with the National Quality Centre (NQC) that is supported by its location in the capital city of Tripoli; this supports participation in international conferences and workshops and enhances their knowledge on quality matters. (A Faculty Member ***in*** the school of Education at Tripoli University) stated:

> *In general, staff members of Tripoli University have better knowledge in education quality matters when compared to Gharyan University. Tripoli University is one of the oldest universities that hosts well-qualified staff members and its proximity to National Education Quality Centre enable the staff members attend conferences, workshops and other quality related activities.*

An analysis of interview responses on leadership issues also relates to the fact that the leaders in Tripoli University (ACTU) are aware of various TQM tools and

techniques and their perceptions are different from other respondents (Boxes 6.4.1 and 6.4.2). It is visible from the interview responses that the senior personnel of Libyan higher education are not quality trained. Some respondents suggested that the appointment of Libyan higher education leaders should be based on their qualification and expertise in education quality (Box 6.4.1).

Low scores of Gharyan (ACGU) University on leadership QAPs can be attributed to the fact that it is a regional level institution that caters to the education needs of the region south of Tripoli city (section 2.6 This university was established much later than Tripoli University and often follows quality procedures communicated from national level agencies such as the Quality Centre and the Higher Education Secretariat at the Ministry. In Tripoli, however, has good links with the international quality community; for example, it runs an international quality management conferences and seminars. The context of SQM it can be said that the level of quality consciousness in of this university is at emerging state (section 2.7). Therefore, the leadership QAPs LD2 (leadership involvement with various stakeholders), LD4 (leadership commitment to continuous improvement) and LD8 (leadership ability to take timely decisions) requires further development at this University (ACGU). Keyword contents in the case of LD2 and LD4 have shown below average status and Table 6.4 reveals that awareness of these action programmes is relatively low.

In the case of LD4 a high Kruskal-Wallis Mean Ranks (KWMR) score was observed in Tripoli University when compared to the Quality Centre and Higher Education Secretariat, which are supposed to practice continuous improvement programmes at their own centres in a professional manner. Significant differences existed among the most institution groups on their observation were 5 QAPs from 9 QAPs in Table 6.2 and this is also validated by differing viewpoints expressed by Libyan higher education leaders (Box 6.4.1).

Box 6.4.1 significant differences among leadership QAPs

Interview responses on leadership Quality Action Programmes (QAPs) obtained from institution group members showed various perceptions that supported the statistically significant differences on the leadership QAPs. (Interviews 11, 12 and 24). A Director in Quality Centre commented that the role of university's senior leadership is one of the most important factors to pursue quality in the universities but the leadership need attend training programmes first in order to gain more insight into quality:

... the criteria for selection of top leaders in the Libyan universities are centrally decided and one of the criteria is related to loyalty to the political system itself and these standards exist in many Arab universities; therefore these leaders continue in the system regardless of the qualifications, competency standards and experience... the senior leadership need to show commitment to quality assurance which is the most important factors that help to pursue quality and its application within the universities; in addition, leaderships training is one of the important consideration. This does not mean that university leaders should bear all the responsibility for quality. In the application process, leadership is like a fertile ground on which the sustainable quality plants can grow.... (Director of quality management at Quality Assurance and accreditation Centre in Tripoli.)

Gharyan University also confirmed that some of the leadership of Libyan universities are not appointed but nominated, although they are lacking in quality oriented professional qualifications (faculty member at faculty of dentist at the University of Gharyan.).

A Director of Quality at faculty of Dentist in Tripoli University*... suggested that enhancing quality requires establishment of a permanent committee with the participation of education experts and industry leader's* .However a relatively better reference to leadership was quoted by two Directors in Tripoli University that has scored higher Kruskal-Wallis Mean Ranks (KWMR) than other groups under institution category:

... sustainability of education quality depends on the vision mission of the leadership on investment in knowledge systems and skills that makes them capable of leading the community towards the future; they (the leaders) should be aware of the importance of creativity and talent ... (Director of the Office of Quality Management at the University of Tripoli).

... The application of quality in higher education requires a focus on continuous improvement; customers focus (students), administrative leadership, and the full participation of workers, decision-making and training. (Director of graduate studies at the University of Tripoli).

...The implementation of quality must relate to all facilities of the university focusing on for all activities of development with a focus on measuring and evaluating performance. (Dean of faculty of Sciences at Tripoli *University*)

It can be said that these references to the leadership qualities inadequately define the design criteria and definitions of leadership discussed under the EFQM, Five Capital model and higher education leadership studies (section 4.8 ; section 4.10). Therefore initial emphasis should be laid on TQM training to the senior leaders of Libyan higher education.

Box 6.4.2 Libyan leadership awareness on sustainable development

The initial questions asked during the semi – structured interview focused on the perceptions of the Libyan higher education leaders on sustainable development in relation to education quality. The Minister of Higher Education, who is one of the senior leaders himself at the national level, *stressed that presence of a trained and qualified administrative leadership is essential for sustainable development in higher education.*

And the Director of Graduate Studies at Gharyan University *pointed out that the attention of stakeholders on environmental problems, their participation in finding solutions to them followed by the preparation and the Implementation of the programmer of quality can lead to optimal exploitation of natural resources*.

Despite these individualistic ideas, Dean of the Tripoli University; section 4.8 *described sustainable development with the globally accepted definition of meeting the needs of the present generation without sacrificing the needs of the future generations.*

In addition he also stressed the five capital perspective that all available resources including human, financial are used with a focus on distant future. In all these descriptions the respondents also stressed the need for focusing on their specific subjects. Kruskal Wallis tests have shown that most respondents unequivocally agreed to extend the functions of the university towards environment and community welfare. It was observed that many similar expressions of Tripoli University interview respondents validated Kruskal Wallis results for various QAPs under Leadership CSF (Table 6.2). Therefore it is suggested that the leadership in Tripoli University is aware of the importance of the leadership QAPs.

If the Libyan higher education leaders are aware of quality and sustainability, then why are the scores for various environment and people related actions programmers low? This is also revealed by the results presented in this chapter (Table 6.2). Some leaders pointed out that the centralised higher education that prevailed in the past one of the major reasons as a Head of the department in Tripoli University commented:

*.... recent transitions of higher education institutions towards decentralization is a shift of style from the traditional governance that focused mainly on individual work; now there is an increased level of interest on the tools and techniques of quality management with emphasis on participation of everyone...(*Leader at Faculty of Economic at Tripoli University.)

The emphasis laid on decentralization and participation of everyone in the above statement is related to LD9 that questions the ability of leadership to create a culture of involvement and ownership among all staff members. In addition to these reasons a Head of the Law Faculty at the Gharyan University opined that increased enrolments witnessed in the recent past affected quality:

...a weak relationship between the quality of higher education and sustainable development modules may be a result of extended attention to quantity (of enrolment) in the recent years at the expense of quality...

This support the statistics presented in section 2.6 that shows significant increase in Libyan enrolment in the past decade. But it can be argued that increase in enrolment not necessarily affect quality and or sustainability; this is because an inverse relationship between quantity and. quality and sustainability has not been reported in the literature studied. A resource exploitative system can lead to weak sustainability (section 4.7; Isaksson and Garvare, 2001) and therefore it can be said that excessive exploitation of human capital is not recommended in the sustainability angle.

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6.4.2 Decentralisation of Libyan Institutions

Discussions presented in the section 2.5.2 on the decentralization of Libyan higher education are related to Quality Action Programmes (QAPs) LD8 and LD9 which advocate the need for collective and timely decision-making and the participation of all stakeholders. This is because the top management of Libyan higher education has indicated that the efforts of decentralization were directed towards enhancing people participation which can create an atmosphere of ownership among the stakeholders. High Kruskal Wallis Mean Rank (KWMR) by Tripoli University for these QAPs indicates a positive perception of decentralization efforts in contrast to the Gharyan University which has scored low revealing (Box 6.4.1 and Box 6.4.2).

6.4.3 Leadership Awareness on Biodiversity and Natural Resources

Groups under institution and faculty categories shown the difference on the issue that the leadership should be aware of biodiversity and natural resources (LD6) and social justice (LD7) and many interviews responses indicated that the Libyan education leaders are aware of the importance of environment and natural resources (Box 6.4.2). A scrutiny of the source tables showed that high KWMR scores for these QAPs were given by Quality Centre and Higher Education Secretariat, but the Academic respondents have scored less. It is recalled here that while "sustainability in campus" oriented policy documents have been already developed by UK universities for an action plan on these QAPs; little work has been reported by the Libyan academic institutions involved in these studies. Therefore, the vivid descriptions of sustainable development presented by the Libyan university leaders have not been translated into action due to the reasons explored in Box 6.4.2.

6.5 Policy and Strategy (PS)

Policy and strategy generally refer to the plan of the institution based on values and vision and how these are translated into actions and referred to as "deployment" in the EFQM model (section 5.4). From sustainability angle, these policies and strategies lead the system towards the minimal use of natural resources and maximise innovation (section 5.4.1). The 15 QAPs considered for analysis as listed in Table 6.5A and 6.5B,

pertain to the policies and strategies in the SQM perspective. Statistical test results pertaining to these QAPs are presented in Table 6.5A Table 6.5B, Table 6.6A, 6.6B and Figure 6.2. Among these Table 6.6 A and 6.5B present the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by the Group Average of a QAP (GAQ), rank of the GAQ within the Policy and Strategy CSF and Sustainability Index (SI). Table 6.6A and 6.6B present the Mann Whitney statistics for gender and location groups (two groups each). Figure 6.2 summarises Table 6.5A, 6.5B, Table 6.6A and 6.6B by showing groups that have scored high or low for the largest number of QAPs. Finally, Table 6.7 presents results of keyword content analysis pertaining to the QAPs under this Critical Success Factor (CSF).

Table 6.5 A: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Policy and Strategy CSF . * Policy and Strategy (PS).

QAP No.	CATOGORY >>	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP/ KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP/ KWMR		P		
		High	Low		High	Low		High	Low		High	Low			
PS1	Quality policy and strategy is only understood at senior levels of the organization	NAQC 372.9	ACTU 331.3	0.668	ENGG 302.5	MED 234.2	.032*	OTH 352.2	DOC 325.4	.209	SEN2 368.5	MID2 309.4	.045*	1.94 / 15	0.400
PS2	Performance evaluation of staff members is not based on quality	NAQC 388.5	STU 307.7	0.017*	ENGG 309.7	EDU 240.7	.177	OTH 352.6	MAS 331.0	.451	YO 358.4	SEN1 284.9	.076	2.10 / 13	0.430
PS3	Planning for quality is considered to be important	ACTU 368.2	ACGU 310.9	0.007*	DENT 297.5	EDU 244.6	.526	MAS 363.1	DOC 306.2	.002**	MID1 352.7	SEN2 216.8	.163	2.28 / 5	0.460
PS4	The organization evaluates quality mainly through formal inspection of employees work	ACTU 376.7	ACGU 292.3	**0.000** **	DENT 330.2	MED 238.5	.385	OTH 360.1	DOC 305.2	001**.	YO 368.6	SEN2 206.8	.014*	2.27 /7	0.464
PS5	The organization recognises the value of environmental and ethical issues in financial processes	ACTU 348.4	NAQC 321.8	0.969	ENGG 285.5	MED 235.0	.692	OTH 348.7	MAS 332.9	.647	MID2 351.3	SEN2 151.1	.322	2.13 / 12	0.429
PS6	There is transparency in the organizational processes	NAHE 415.9	ACGU 317.3	0.019*	PHAR 301.5	MED 229.3	.140	OTH 345.5	DOC 329.5	.552	YO 366.5	SEN2 160.5	.008*	2.08 / 14	0.432

(* indicates p <= 0.05 and ** indicates p<= 0.005)

Table 6.5.B: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Policy and Strategy CSF (PS)

QAP No.	CATEGORY >>	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP/ KWMR		p	GROUP / KWMR		p		
		High	Low		High	Low		High	Low		High	Low			
PS7	There is significant promotion of local culture in the institution's functions	NAQC 367.4	NAHE 297.9	0.009*	DENT 314.6	MED 221.7	.489	OTH 355.0	DOC 321.8	.142	MID1 354.6	SEN2 66.5	.032*	2.22 / 9	0.451
PS8	The institution strongly promotes the efficient use of natural resources	ACTU 353.4	ACGU 324.6	0.399	DENT 313.1	LAW 247.4	.494	OTH 352.0	DOC 323.4	.186	YO 357.3	SEN2 228.5	.379	2.15 /11	0.438
PS9	The intuitions strongly promotes innovation in its research, teaching and administration	ACTU 387.0	ACGU 294.6	**0.000****	MED 304.5	PHAR 218.8	.290	OTH 347.2	DOC 325.8	.345	YO 366.0	SEN2 127	.020*	2.29 / 4	0.450
PS10	The organization Includes stakeholders' needs and expectations in its strategy	ACTU 387.8	ACGU 296.0	**0.000****	ECON 310.2	PHAR 229.5	.043*	MAS 363.0	DOC 312.9	.012*	MID1 354.5	SEN1 301.0	.243	2.38 / 1	0.475
PS11	Performance is clearly related to relevant benchmarks	ACTU 366.9	ACGU 314.3	0.015*	DENT 307.2	ECON 227.9	.099	MAS 356.7	DOC 314.7	.028*	MID2 350.3	SEN2 205.1	.139	2.28 / 6	0.456
PS12	Individual and team objectives are aligned with the organization's strategic goals	ACTU 388.0	NAHE 294.3	**0.000****	DENT 327.6	EDU 231.2	.006	MAS 361.6	DOC 327.7	.071	MID1 357.9	SEN2 266	.131	2.38/ 2	0.469
PS13	Staff awareness of the relevance of the organization's goals to their activity is high	ACTU 369.4	ACGU 313.7	0.003**	DENT 309.7	PHAR 230.3	.070	MAS 357.9	DOC 326.9	.122	MID1 351.9	SEN2 269.5	**.**033*	2.32/ 3	0.462
PS14	The organization has a strong commitment to the local population	ACTU 378.7	STU 306.1	**0.000****	DENT 298.4	PHAR 251.1	.852	MAS 358.0	DOC 324.1	.117	MID1 349.5	SEN2 291.1	.383	2.26 / 8	0.446
PS15	The organization has a strong commitment to global resources, the environment and conservation	NAHE 355.4	NAQC 284.8	0.062	DENT 339.6	ECON 245.0	.155	MAS 341.0	OTH 336.3	.954	MID1 344.8	SEN2 294.5	.762	2.18 /10	0.435

(* indicates p <= 0.05 and ** indicates p<= 0.005)

Table 6.6A: High and low scores of Mann Whitney Mean Rank (MWMR) and probability levels of significance for various QAPs under Policy and Strategy CSF

QAP No.	CATOGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		p
		High	**Low**		**High**	**Low**	
PS1	Quality policy and strategy is only understood at senior levels of the organization	F 346.5	M 336.5	.468	GHAR 344.1	TRIP 336.1	.531
PS2	Performance evaluation of staff members is not based on quality	F 340.9	M 338.9	.895	TRIP 350.6	GHAR224.3	.064*
PS3	Planning for quality is considered to be important	M 342.6	F 332.3	.511	TRIP 358.6	GHAR313.4	**.000***
PS4	The organization evaluates quality mainly through formal inspection of employees work	F 344.6	M 337.3	.628	TRIP 367.3	GHAR301.4	**.000***
PS5	The organization recognises the value of environmental and ethical issues in financial processes	M 342.2	F 333.2	.545	GHAR 344.6	TRIP 335.8	.526
PS6	There is transparency in the organizational processes	F 357.2	M 331.9	.090	TRIP 355.3	GHAR 317	.007*

(* indicates p <= 0.05 and ** indicates p<= 0.005)

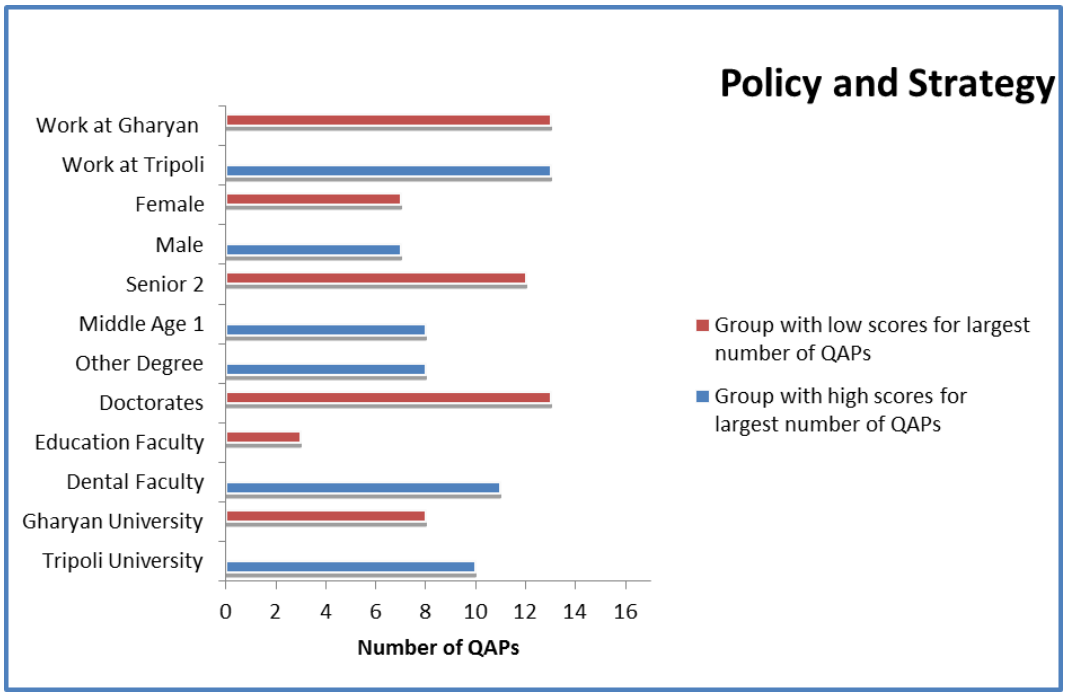

Figure 6.2 .Largest number of QAPs for which different groups have scored high or low KWMR (or MWMR) under Policy and Strategy CSF (from tables 6.5A, 6.5B & 6.6A, 6.6B)

Table 6.6B: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under Policy and Strategy CSF(* indicates p <= 0.05 and ** indicates p<= 0.005)

QAP No.	CATEGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		p
		High	**Low**		**High**	**Low**	
PS7	There is significant promotion of local culture in the institution's functions	F 349.2	M 335.3	.365	TRIP 355.5	GHAR317.6	.008*
PS8	The institution strongly promotes the efficient use of natural resources	M 340.3	F 337.7	.856	TRIP 351.6	GHAR323.8	.045*
PS9	The intuitions strongly promotes innovation in its research, teaching and administration	F 343.9	M 337.6	.680	TRIP 356.0	GHAR304.5	**.000****
PS10	The organization Includes stakeholders' needs and expectations in its strategy	F 346.4	M 336.5	.522	TRIP 370.5	GHAR 297.0	**.000****
PS11	Performance is clearly related to relevant benchmarks	M 344.2	F 328.7	.309	TRIP 355.4	GHAR 317.7	.007*
PS12	Individual and team objectives are aligned with the organization's strategic goals	M 343.9	F 329.2	.335	TRIP 371.6	GHAR296.0	**.000****
PS13	Staff awareness of the relevance of the organization's goals to their activity is high	M 346.9	F 322.2	.091	TRIP 360.0	GHAR312.1	**.000****
PS14	The organization has a strong commitment to the local population	F 341.8	M 338.5	.831	TRIP 361.6	GHAR309.3	**.000****
PS15	The organization has a strong commitment to global resources, the environment and conservation	M 342.1	F 333.4	.558	TRIP 348.8	GHAR326.8	.113

6.5.1 Significant Differences Among Institution Groups

Among the 15 QAPs listed under the Critical Success Factors (CSF) on Policy and Strategy 11 have resulted in significant difference among various groups under the institution category (Table 6.5A, 6.5Table 6.5B).

Tripoli University has scored high Kruskal-Wallis Mean Ranks (KWMR) for eight QAPs and the Gharyan University has scored low for seven. At Gharyan University matters relating to this area of policy and strategy are less evolved when compared to Tripoli University; this also relates to the discussion at the beginning of section 6.3 on education quality evolution at Tripoli University. Eleven out of fifteen QAPs under this CSF have shown statistically significant differences among the observations of the institution groups on matters relating to performance evaluation based on quality (PS2) quality planning (PS3), inspection (PS4), transparency (PS6), promotion of local culture (PS7), promotion of innovation (PS9), stakeholder needs (PS10), benchmarking (PS11), individual and team objectives (PS12), awareness on organisations goals (PS13) and commitment to local population (PS14).

Table 6.7: Keyword content of responses gathered for indirect questions of semi – structured interviews under Policy and Strategy CSF(6.5.A,6.5.B,6.6.A,6.6.B)

Keyword	Linked to QAP	Number of occurrences	Awareness level
environment	PS5, CI7	85	Above average
admin, administration	PS9	63	Above average
aim, goal	PS13	54	Above average
research	PS9	51	Above average
human	PS2 , CI2	39	Above average
teach, teaching	PS9	34	Above average
community	PS14	33	Above average
finance, financial	PS5	19	Below average
Innovate, Innovation	PS9 , CI3	15	Below average
transparency	PS6	11	Below average
Team	Ps12	10	Below average
Individual	PS12	7	Below average
benchmark	PS11	4	Below average
stakeholder	PS10, CI1	3	Below average
conservation	PS15	2	Below average
		Average = 28.7	

It was verified from interview responses that for some of these QAPs the respondents had expressed different views as shown in Table 6.8.From the evidence presented in Table 6.8, it is inferred that the differences predominantly arise due to the following causes: (a) Respondents have not fully understood the question and its implications. This is also the researcher's personal experience as many respondents asked for a further explanation for the questions. For example, for the case of PS3 one respondent has expressed that the faculty members should be involved in the planning process, but the second respondent has opined that everyone should be involved in the planning process. The second opinion is more favourable in the SQM perspective. Obviously, the first respondent has not fully understood the implications of SQM (b) Respondents have little awareness of the QAP either because SQM is a relatively a new concept in the higher education context. For example, for the case of PS7 that advocates the promotion of local culture; in the higher education, this implies that the tribal population of Libya should be encouraged to enrol and subjects should be introduced pertain to their profession and trade. However, the perception of a respondent that the tribal culture is a hindrance to quality can be viewed as a lack of awareness about on this issue. In addition, the existence of the differences among the academic and non–academic groups in general, is revealed by the differences in the level of correlation coefficients shown in Table 7.18. Tripoli University and Gharyan University have a medium correlation whereas the non–academic groups, Quality Centre, Ministry of Higher Education have low correlation.

6.5.2 Deming's Principle on Inspection

Deming's principle that organizations should cease inspection for quality is addressed by the question PS4; this question whether the respondents' institution evaluates the quality of employee's work based on inspection and resulted in significant differences in a majority of groups under four categories institution, qualification, age, and location but not (Faculty and Gender).

Table 6.8: Explanations for significant differences among the institution groups (Table 6.4A and 6.4B) based on the semi – structured interview responses

QAP No.	Description of the QAP	Differing Interview responses	Explanation for significant differences among institution groups in Table 6.4A and 6.4B
PS3	Organisations should plan for quality from the very beginning so that can permeate every aspect of its activity.	*...engaging members of the faculty and staff in the evaluation process for... are planning* **(**Dean of the University of Tripoli). *The participation of everyone in the planning and ... decision-making....* (Leader at Faculty of Economic at Tripoli University).	Respondents have different viewpoints on involving only faculty or everyone in the planning process that confirms significant difference. However there is little reference quality planning in the responses.
PS4	One of Deming's principle advocates ceasing inspection of employees work for quality. It rather suggests to promote creativity and innovation among employees	*....start from within the institution through the process of self-evaluation...* **(**Dean of the University of Tripoli). *...quality is measured by the external evaluation through specialised technical committees, which examine all aspects of the basic quality standards required in the curriculum and learning environment* **...** **(**Director of Quality in the Faculty of Medicine at the University of Gharyan). *Yes, of course, I think inspection is important in enhancing education quality. Because, the formal inspection process reveals the mistakes and faults...* **(**Faculty member in school of Education at Tripoli University).	Respondents have different opinions on the use of self - assessment or external evaluation on performance evaluation of staff. External evaluation is considered as inspection oriented. A more detailed discussion on internal and external evaluation is presented in Box 7.5.1
PS9	The institution promotes creativity and innovation in activities related to teaching, research and administration	*...enhance creativity and innovation in institutions by providing the university with financial support, laboratories with modern equipment and chemicals in order to motivate all stakeholders towards the innovation, creativity...* (Faculty member in school of Education at Tripoli University). *... implement inspection system and incentives for creativity and innovation..* (Faculty member in faculty of Account at Gharyan University).	Respondents have different viewpoints about how to promote creativity and innovation. According to Deming's principle inspection of employee work may lead to hampering creativity and innovation.

...of course, I think inspection is important in enhancing education quality because the formal inspection process reveals the mistakes and faults in the institutions; this can help the stakeholders to improve their plans and strategies (faculty member in school of Education at Tripoli University).

Deming's arguments against inspection are accepted from the point of view that it results in hampering creativity and innovation of the stakeholders. However both quantitative and qualitative results obtained in this study reveals that the traditional inspection system is still practiced in Libya.

6.5.3 Perceptions of Groups on Environmental and Ethical Issues

For the Triple Bottom Line (TBL) based question relating to PS5 about including environmental and ethical issues in the financial process, the KWMR and MWMR tests show that there is no significant statistical differences observed between groups in these QAPs even though the Tripoli University has scored high when compared with the Quality Centre has scored low . Non-existence of these procedures can be verified from the statement of a Director at the Gharyan University:

... the environmental sustainability in the Libyan universities can be achieved Environmental Audit Programmes with the objective of implementing necessary measures to reduce adverse environmental impacts.... (Director of Graduate Studies at the University of Gharyan).

This question is related to the environmental and ethical dimensions of sustainability and lack of implementation of this QAP at the Quality Centre indicates that sustainability concepts are yet to be integrated with the quality processes of this centre. In contrast to this, the importance of integrating local culture (PS7) was scored highest at the same centre and there is a significant difference between institution group this indicate that this a principle that is important for TQM sustainability as suggested in many past studies (section 4.7). Having scored less for these QAPs the academic groups at the universities have shown that unlike the quality centre, local cultural issues are not well integrated into the university campuses (section 2.4.4).

In the SQM context transparency (PS6) concerning objectives, decision making and accountability often resistance (Tappeser, 2002). However, increased emphasis on

transparency and accountability is changing the organisational role of leaders, senior academics and administrators (Osseo-Asare, 2004). The keyword content of responses presented in Table 6.7 shown that the transparency was below the average Low scores by the Gharyan University were acknowledged by a Director of the Office of Quality at the University of Gharyan:

> *... Senior management of the universities should address the weaknesses in the process of finances allocation for the development of resources ... there is a need for clear criteria for assessment with a commitment to transparency in the development and application of policies...*

On the efficient use of natural resources (PS8), no significant differences were observed among various groups. Tripoli University scored a high KWMR for this QAPs indicating that it has initiated steps towards 'green campus' concepts despite being situated in the capital city of the country. Contrarily, low scores by Gharyan university on this aspect, even though it is situated in the green agricultural belt of the country indicates that the same 'green campus' agenda is less visible in this campus.

..there is a need for the establishment of environmental clubs to enable students to become acquainted with the important environmental issues. The number of environmental trips and field activities can be increased which will increase the awareness of the students. It is important to implement an effective environmental management system to reduce the environmental pollution at the university facilities and works... (Director of Graduate Studies at the University of Gharyan).

Some universities in the UK (including DMU and UWE) have already initiated clear policies on environmental management and waste management programmes in the student campuses (UWE, 2012). The researcher was unable to find any documentation on environmental quality policies either at Tripoli or Gharyan universities. Development of more comprehensive policies on efficient use of natural resources in these campuses is emphasised.

6.6 Continuous Improvement

Continuous improvement implies the ongoing improvement of products, services, or processes through incremental and breakthrough improvements (Hogg,

1995);section 5.5). In the SQM perspective, the above-mentioned improvements can be grouped under the three dimensions of the Triple Bottom Line (TBL) that include economics, social and environment (Elkington, 2004). Each of the Eleven QAPs listed in Table 6.9 relate to either one of these three dimensions. Statistical test results pertaining to these QAPs are presented in Table 6.9, Table 6.10 and Figure 6.3. Among these Table 6.9 presents the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by Group Average of a QAP (GAQ), the rank of the GAQ within the Continuous Improvement CSF and Sustainability Index (SI). Table 6.10 presents the Mann Whitney statistics for gender and location groups (two groups each). Figure 6.3 summarises Table 6.9 and Table 6.10 by showing groups that have scored high or low for largest number of QAPs and Table 6.11 presents results of keyword content analysis pertaining to QAPs under the continuous improvement CSF.

6.6.1 Collection of Feedback

The importance of getting regular feedback from all stakeholders (CI2) is an issue highlighted by much previous research in the Arab world (for example QAAC of Egypt, (UWE, 2012). Tripoli University has scored high KWMR for this but the students group has scored low. Employee feedback and customer feedback are some of the issues focused upon by the EFQM model. And the study identified significant differences on this question

From the questionnaire, it can be seen that feedback from employee and students is not regularly collected. This is also supported by the interview responses of many staff members; for example, (Accountancy Faculty member in Gharyan University) opined:

> *Feedback from students, staff and faculty members, is handled by the respective departments of the college, but it is not done on a regular basis; feedback on the selection of teaching materials by faculty members is collected occasionally. Feedback from parents is generally obtained through complaints made by some parents and centres on the problem of non-acceptance of their children in college as a result of certain matters relating to regulations. Feedback from the community is limited to acceptance of teaching assistants and new faculty members at the college.*

Although the above response contains the word “feedback”, it is because a specific question was raised on this issue. Unfortunately, none of the indirect questions were addressed using term “feedback” (Table 6.15); this corroborates that awareness about feedback collection and processing is lacking in the Libyan higher education system.

Table 6.9: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Continuous Improvement CSF (CI)

QAP No.	CATEGORY	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p		
		High	**Low**		**High**	**Low**		**High**	**Low**		**High**	**Low**			
CI1	Regular feedback about quality is gathered from all stakeholders of the institution	ACTU 359.6	STU 301.1	**0.049***	DENT 313.2	PHAR 215.6	.028*	MAS 345.0	OTH 335.3	0.825	MID1 349.3	SEN2 137.3	.187	2.16 / 6	0.432
CI2	Investment in human resources is considered important by the organization	STU 367.2	NAHE 286.5	**0.007***	LAW 289.6	ARTS 247.6	.741	MAS 352.2	DOC 331.2	0.405	SEN1 356.2	SEN2 208.5	.552	2.32 / 4	0.460
CI3	Creativity and innovation are considered important by the organization	NAQC 359.3	NAHE 252.8	0.103	DENT 330.9	MED 204.4	**.000****	DOC 342.7	OTH 331.8	0.770	MID2 344.8	SEN2 213.5	.704	2.23 / 5	0.440
CI4	The institution has good systems for continuous improvement	ACTU 394.0	NAHE 253.2	**0.000****	DENT 327.8	PHAR 215.7	.039*	MAS 361.8	DOC 319.6	0.045	YO 351.4	SEN1 294.7	.280	2.42 / 1	0.471
CI5	Academic curricula of the institution are continuously improved	ACTU 373.5	NAHE 238.6	**0.000****	EDU 307.3	PHAR 211.9	.006*	MAS 362.2	OTH 317.3	0.026*	MID2 345.3	SEN2 203	.491	2.33 / 2	0.454
CI6	Educational outcomes are continuously reviewed	ACTU 389.5	ACGU 292.5	**0.000****	ECON 310.8	PHAR 209.6	.014*	MAS 354.7	DOC 331.3	0.297	MID1 344.8	SEN2 275	.898	2.32 / 3	0.460

CI7	Recycling waste and neutralizing harmful materials on the campus is considered important by the organization	NAQC 373.8	NAHE 307.3	0.110	EDU 310.5	MED 219.3	.016*	DOC 350.0	MAS 331.1	0.512	MID2 366.8	SEN2 260.5	.062	2.02 / 11	0.407
CI8	Employees are involved in the continuous review of organizational processes	NAQC 350.5	STU 303.0	0.215	LAW 284.2	ARTS 239.6	.721	MAS 348.5	DOC 333.5	0.633	MID1 346.7	SEN1 319.5	.847	2.05 / 8	0.410
CI9	Physical assets such as buildings, equipment , materials and stocks are continuously improved	NAQC 369.9	STU 335.2	0.875	LAW 302.6	MED 221.1	.089	MAS 346.8	DOC 327.5	0.433	SEN2 422	SEN1 267.0	.007*	2.05 / 9	0.420
CI10	The continuous promotion of biodiversity and environmental conservation is considered important	STU 332.1	ACTU 313.2	0.009*	EDU 312.6	MED 222.1	.070	DOC 352.5	MAS 330.7	0.377	SEN1 362.5	YO 313.6	.320	2.04 / 10	0.409
CI11	There are clear procedures for identifying and evaluating emerging environmental technologies	ACTU 359.9	STU 320.9	0.152	DENT 329.6	PHAR 214.0	.014*	DOC 344.5	OTH 329.1	0.623	SEN1 388.1	SEN2 323.3	.313	2.13 / 7	0.423

(* indicates p <= 0.05 and ** indicates p <= 0.005),

Table 6.10: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under Continuous Improvement CSF (CI)

QAP No.	CATEGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		P
		High	Low		High	Low	
CI1	Regular feedback about the quality is gathered from all stakeholders of the institution	M 348.3	F 319.1	.047	TRIP 350.1	GHAR 325.5	.065
CI2	Investment in human resources is considered important by the organization	F 348.3	M 335.7	.409	TRIP 357.4	GHAR 315.3	.003**
CI3	Creativity and innovation are considered important by the organization	M 342.1	F 333.4	.558	TRIP 351.0	GHAR 323.7	.050
CI4	The institution has good systems for continuous improvement	M 343.5	F 330.1	.387	TRIP 376.2	GHAR 289.6	**.000****
CI5	Academic curricula of the institution are continuously improved	M 342.9	F 331.6	.442	TRIP 357.4	GHAR 315.5	.002**
CI6	Educational outcomes are continuously reviewed	F 345.0	M 337.1	.613	TRIP 376.1	GHAR 289.4	**.000****
CI7	Recycling waste and neutralizing harmful materials on campus is considered important by the organization	F 346.7	M 336.4	.503	GHAR 354.8	TRIP 328.4	.064
CI8	Employees are involved in the continuous review of organizational processes	M 342.5	F 332.5	.512	TRIP 344.7	GHAR 332.4	.384
CI9	Physical assets such as buildings, equipment, materials and stocks are continuously improved	F 361.1	M 330.2	.041*	TRIP 342.8	GHAR 335.0	.582
CI10	The continued promotion of biodiversity and environmental conservation is considered important	F 349.9	M 335.0	.330	GHAR 359.8	TRIP 324.7	.014**
CI11	There are clear procedures for identifying and evaluating emerging environmental technologies	M 341.5	F 334.8	.657	TRIP 351.5	GHAR 223.0	.042*

(* indicates p <= 0.05 and ** indicates p<= 0.005)

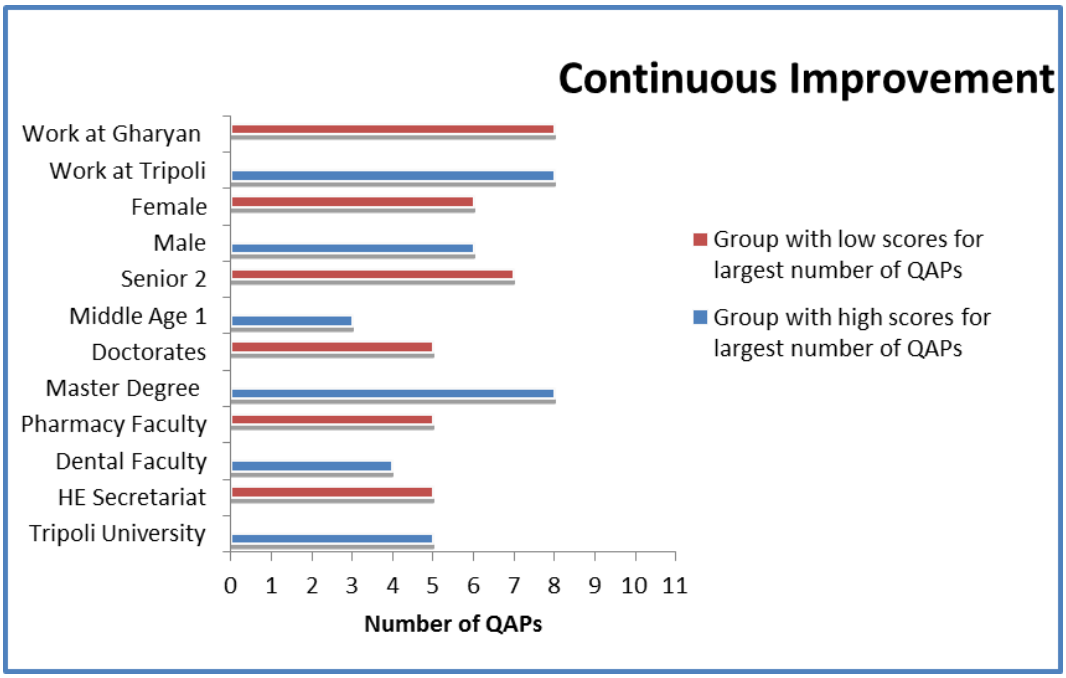

Figure 6.3: Largest number of QAPs for which different groups have scored high or low KWMR (or MWMR) under Continuous Improvement CSF (from tables 6.9 & 6.10).

Table 6.11: Keyword content of responses gathered for indirect questions of semi – structured interviews under Continuous Improvement CSFs

Keyword	Linked to QAP	Number of occurrences	Awareness level
improve, improvement	CI4, CI5	79	Above average
continuous	CI5	26	Above average
curricula, curriculum	CI5	23	Above average
technology	CI 11	23	Above average
creativity:	CI3	20	Above average
Waste	CI7	8	Below average
infrastructure	CI7	4	Below average
conservation	CI10	2	Below average
Asset	CI9	1	Below average
recycle	CI7	0	Lacking
		Average = 18.6	

6.6.2 Human Resources Development

Significant differences existed between the institution groups on the question CI2 that dealt with investment in human resources. In section 2.6 it was noted that human resources in the academic Universities of Libya are constrained and a large number of expatriates were recruited as teaching staff in most Universities. By scoring high KWMR for this question students have shown a higher level of awareness on this issue; this could be because students interact with the expatriate teaching staff members on a day – to – day basis during the teaching – learning processes and the investments made in expatriate staff are visible to them. A Master's student stated:

> *... development of human resources requires capacity development through creativity; skills in learning and self-education, application of information technologies, desire to continue to learn and develop research methods....a database on the recruitment, innovation capacity and professional capacity of staff members is very useful* (An accounting research student in business administration at Gharyan University).

However, it appears that these quality criteria are sometimes deviated from during the recruitment process as is evident from the response of a Director at the Quality Centre:

> *...the Ministry of Higher Education has appointed hundreds of faculty members without standard references to the selection criteria ....during the year 2011 – 2012...*

The low KWMR scored by Higher Education Secretariat (CI2) show in Table 6.9 lack of awareness on this issue, although this agency has considerable responsibility at the national level for human resources management.

6.6.3 Creativity and Innovation

Creativity and innovation (CI3) are important issues for both quality and sustainability (Section4.4). Responses to this question showed no significant differences between groups which are surprising. Because in the context of sustainable quality, creativity and innovation can be viewed from two perspectives. Firstly these QAPs can be implemented in teaching and learning processes (Section 4.9). Secondly, this can be applied in the quality management processes of the higher education system, such as

innovating new methods of getting student feedback through electronic media etc. Although Libyan universities have introduced many innovations to improve teaching and learning processes in the past, research surveys among students have shown that creativity and innovation are lacking in the Libyan curriculum and examination systems (ELhensheri, 2004). The Quality Centre scored high for this QAP and can be viewed from the second perspective mentioned above; it can be inferred that although creativity and innovation are observed at higher levels, these are less visible at the Libyan Higher Education Secretariat (LHES). A discussion on organizational innovations suggests that it is positively linked to increased functional heterogeneity of the teams involved and to the flexibility and empowerment of staff. The hierarchical organizational culture and centralized decision making system observed in the Libyan Higher Education system can be considered as a barrier to these positive drivers for innovation (section 2.4.4).

References to creativity and innovation appear to be important to the university leadership as the word "creativity" appeared above average in Table 6.11 in indirect question responses. The Dean of the Tripoli University observed:

...quality implies creativity and innovation in thinking.

However, Elhensheri's (2004) findings are verifiable through the statement of the Director of Graduate Studies in Tripoli University:

... Predominantly education relied on memorization and not on creativity and innovation in thinking...

Box 6.6.1 Skills, labour market and sustainability

Frequent references to student skill sets were made by Libyan higher education leaders in the interview responses. Skills are important for students position in the labour market; a point made by the Director of quality management at Quality Assurance and accreditation Centre in Tripoli

I want to ask you if our universities are giving key importance to providing training on the skills required in the labour market. Or do they still insist on studying basic and natural sciences...I think students should know about the work they will do after graduation

A similar view was expressed by a (Head of department in Tripoli University):

... The requirements of the labour market are changing and a growing number of employers like to recruit graduates having basic work skills, interpersonal skills, critical thinking skills for decision-making; they need to have an understanding of the world around them so they can deal effectively with different cultures around them...

However a different perspective to student skills was proposed by a Director of Quality at the faculty of Dentist at Tripoli University who stressed that preferences to skill sets of the labour market must not hamper the creativity of the students:

To ensure sustainability in the development process and to expedite the process of development in Libya, a student should receive higher education with a particular attention to matters of interest to the state and the society ...such education and training are a key driver of sustainability. Therefore enhancing creativity of the learners is a key factor.

From the above responses it is inferred that the labour market is stressing the importance of functional skills while quality and sustainability requires the promotion of creativity and innovation among students. A lack of creativity and innovation in the Libyan universities is evident from the results of quantitative analysis (QAP CI3 in Table 6.9; section 6.6). The Libyan higher education system needs to evolve a hybrid framework that has a focus on skills required in the labour market but does not exclude development of creativity and innovation among students.

6.6.4 Continuous Improvement of Curriculum

According to ELhensheri (2004), the continuous improvement of the curriculum (CI5) is lacking in the Libyan education system. Results show that observations on this aspect are high at Tripoli University when compared to the regional university at Gharyan. It is noted that for questions CI4, CI5 and CI6 which are directly related to continuous improvement have shown higher level significant differences among the groups studied; this indicates a high level of variation in implementation at various institution groups. See Box 6.6.2.

Box 6.6.2 Continuous Improvement – Summary of issues in Libyan higher education

Most interview respondents unequivocally suggested that continuous improvement of the curriculum is an important factor for enhancing education quality (Interviews 10, 12, 17,). For example a (Director of Quality at the faculty of Dentist in Tripoli University), quoted:

...rapid improvements to curriculum development at various stages of university education ...can lead to quality improvement and excellent performance.

Other aspects which requiring continuous improvement also arose during the interview process. (A Dean of Tripoli University): *stated that improvements to teaching strategies and methods are also key factors for continuous improvement.* (A Director of Quality in the Faculty of Medicine at the Gharyan University): *opined that technologies used in education process need continuous improvement*. The (Head of the Economic Faculty at Tripoli University): *explained that the present curriculum review system is carried out in an isolated manner and the each university is developing its own curriculum. It is a better approach to link the curriculum review process among various universities in a scheduled manner during a calendar year*.

The quality centre has conducted a study in 2007 to identify factors which are barriers to academic improvements and the following areas were identified: *lack of books and references, relying on style indoctrination during the study, lack of freedom of opinion of the students during the lectures, unable to attend seminars and courses related to specializations, lack of encouragement from teachers, using examinations to threaten students, lack of student extra - curricular activities, inability of some teachers to deliver lectures, repeating some of the topics during lectures, ignorance of study regulations and frequent absenteeism of professors* (Director of quality management at Quality Assurance and accreditation Centre in Tripoli.

However, Continuous improvement is an indicator of social sustainability the next sections will explore the success factors relating to environmental issues.

6.6.5 Environmental Sustainability: Neutralising Harmful Wastes

On the environment, oriented question about neutralizing harmful wastes (CI7) there were no significant differences between groups; this suggest that in the higher education context, laboratory based work produces harmful wastes that require disposal after neutralizing them. Clear guidelines for such activities are already outlined in the UK universities (DMU, 2012; UWE, 2012). These guidelines have been affected through the nodal agency for higher education in the UK as part of global sustainable development initiatives (section 4.9). Therefore, it is important for the Libyan higher education system to establish links with the global systems for enhancing sustainable development activities at the campuses. Lack of awareness on this issue is also highlighted by the absence of the keyword "recycle" in Table 6.11.

6.6.6 Enhancing Biodiversity

The question on biodiversity (CI10) is related to increasing the number and variety of biological species in the university campuses (Section 4.9 ; UWE, 2012). One of the challenges that development has caused is a loss of biodiversity (Lozano-Ros, 2003); section 4.10.4 , Table 4.9). Some universities in the UK initiated processes to increase biodiversity in the campuses (UWE, 2012). Past studies have shown that Libyan biodiversity is under threat (section 2.3 And Libya had a General Authority for Environment (GAE) which suspended activities in 2002 due to administrative reasons.

... Nobody is concerned about biodiversity as they do not have adequate capacity and resources to implement programmes on this subject... forestation activities are required in barren lands of the campuses for the conservation of soil and water. Landscaped parking spaces can be developed for promotion of biodiversity... (Faculty member in the school of Education at Tripoli University).

Low scores by the universities on this QAPs calls for revitalizing the system with clear responsibilities being identified for managing the biodiversity of the campuses.

6.7 People Focus

This Critical Successes Factor (CSF) advocates the involvement of all stakeholders in the higher education context (academic, research and support staff, students and parents), (Osseo-Asare, 2004; section 5.6). Apart from these stakeholders, involving the local community by supporting them with education and research output is also emphasised in the SQM perspective. The 17 QAPs listed in Table 6.12 and Table 6.13 covers various aspects relating to the involvement of these stakeholders. Statistical test results pertaining to these QAPs are presented in Table 6.12, Table 6.13, Table 6.14, Table 6.15 and Figure 6.4. Among these, Table 6.12 present the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by Group Average of a QAPs (GAQ), the rank of the GAQ within the People Focus CSF and Sustainability Index (SI). Table 6.13 and Table 6.14 present the Mann Whitney statistics for gender and location groups (two groups each). Figure 6.4 summarises Table 6.13 , Table 6.14 by showing groups that have scored high or low for a largest number of QAPs. Table 6.15 presents results of keyword content analysis pertaining to QAPs of the People Focus CSF.

6.7.1 Stakeholder Approaches and Quality Awareness

The participation of stakeholders in quality management (PF1) and their importance is discussed in the literature sections 4.9 with the conclusion that strong sustainability can be achieved by shifting customer oriented approaches to stakeholder-oriented approaches. The involvement of all stakeholders of higher education and their fulfilment at work are important concepts for TQM implementation (Holmes and McElwee, 1995). Awareness an issue is visible among Libyan higher education leaders as the Minister of Higher Education and a Director in Tripoli University suggested:

...the commitment of senior management, staff participation and teamwork plays a vital role in achieving sustainability. ...towards economic, social and environmental development for the present and future.....

...it is important to recognise that quality is the responsibility of everyone at various levels of higher education system and universities; interaction of parents, students and the rest of society should be included in the process ... (Director of Quality at the faculty of Dentist at Tripoli University).

Although involving everyone can enhance quality awareness (PF3), past studies have shown that quality awareness is low in the Libyan government sector (Youssef, 2006). This is particularly the case among top management although those; but top managers with quality awareness were more willing to improvement. Results obtained in this study showed that the mean rank scores are low for Higher Education Secretariat that comprises of senior managers and older seniors who are representing top management in the higher education sector. Alternatively, the academic group at Tripoli University has scored higher for this question than the Higher Education Secretariat indicating a need to enhance stakeholder approaches at this national level institution.

6.7.2 Reward Systems

The encouragement of students and staff through reward systems (PF10) and the lack of adequate and correct information about how to implement these rewards (PF11) were linked together in a way that is not commonly visible in Libyan higher education but is practiced in some other Arab countries (Badri and Abdulla, 2004). In Libya rewards were often based on political loyalty under the Gaddafi regime, however respondents have stated that this often remain the case, a faculty member in school of Arts at Tripoli University stated:

… In fact, I have not heard any of the bonuses, motivations or reward system in regard to the university faculty members. But this system is restricted to member's only politicians and those close to the former regime. And students also do not have any system of rewards before, but now after the revolution of February 17, the Ministry of Education to stimulate students and graduates excelling dispatched to study abroad. As well as the employees, also there is no system of reward, but rely on the annual report and the annual promotions rotating every four years. This is discussed above in section 6.6.2 . The results in Table 6.12 show that there are not statistically significant differences among the majority of reward QAPs; both Gharyan and Tripoli Universities have high scores for these QAPs but the student group has scored low. This indicate that the reward systems implemented in the universities are not matching their students expectation and are limited to staff members and students who are loyal to the political elite within the institutions.

Economically weaker students are provided with scholarships in the Arab world but this is limited in Libya (UNESCO, 2009); partly for political reasons but also because of the current economic situation. The fieldwork was undertaken after the Gaddafi regime had fallen and as such respondents were less likely to consider rewards as an important factor in Quality (Table 6.15).

6.7.3 Involvement with Local Communities

An organisation's involvement with local communities (PF13) has an impact on its activities and sustainable development implying that the expectations of both the customers (students) and the community are satisfied (Kaivola and Rohweder, 2007b; section 4.9). For example, DMU and UWE have a good public community. This concept is also highlighted by TBL and Five Capital models; the former through the ethical dimension and the latter through the sub - criteria of human capital (Zutshi and Sohal, 2004). Environment and community are closely related; for example, the community's perceptions of an organization are linked to the impact of its activities on the environment. In turn, this also affects the employee morale as employees are concerned about the community's perception about the organization. It is important for the educational institutions to disseminate the research findings to the local community. In these QAPs the results presented in Table 6.12 showed that there are significant differences between the institution groups scoring high for this QAP; for example, Tripoli University has shown strong links to its community, when compared to the regional level Gharyan University. This finding was highlighted by a number of references made by the Libyan higher education leadership about community activities (Interviews 7, 10, 13, 14, 15, 16, 18, 23, 24); because, these can be broadly classified under; community service rendered by students, designing higher education as per community needs and dissemination of higher education research output to the community. (Director of quality management at Quality Assurance and the accreditation Centre in Tripoli) stated: *that as per the UNESCO norms higher education system should include community activities. (*Dean of the University of Tripoli) pointed out: *The application of quality management in higher education institutions will*

Contribute to maximizing the role of the university in economic and social development of the community activities as well as increased interest in sustainable development and reduce waste and loss to the lowest level possible.

However, the Director of Quality in the Faculty of Medicine at the University of Gharyan. *Stressed the meet requirements of students and the local community and scientific research to achieving relationship between the university and society and enhancing quality and sustainability in the good public community such as Tripoli University*.

Table 6.12: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under People Focus CSF (PF).

QAP No.	CATEGORY >>	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		P		
		High	Low		High	Low		High	Low		High	Low			
PF1	The involvement of stakeholders (Student, Staff, Parents, Society) is important to the institution	ACTU 372.2	NAQC 261.2	**0.001***	DENT 318.6	PHAR 242.2	.486	MAS 359.1	OTH 320.7	.083	MID1 346.6	SEN2 199.8	.570	2.27 / 10	0.442
PF2	Feedback on quality related matters is communicated to all staff and students	ACTU 369.5	ACGU 313.0	0.005**	SCI 287.7	MED 233.0	.821	DOC 340.3	OTH 338.8	.995	SEN2 351	MID2 332.9	.962	2.35 / 4	0.469
PF3	Quality awareness is effectively implemented among staff and students	ACTU 381.1	NAHE 288.5	**0.000***	DENT 292.6	MED 230.7	.536	MAS 353.6	OTH 322.0	.200	SEN1 351.8	SEN2 254.5	.730	2.45 / 3	0.473
PF4	4- The role of academic supervisors in quality is considered important	ACTU 381.9	NAHE 244.4	**0.000***	ECON 300.2	SCI 231.7	.026*	MAS 377.2	OTH 306.6	**.000****	MID1 359.7	SEN2 222	.049*	2.53 / 1	0.488
PF5	The institution provides a healthy and safe working environment to staff and students	ACTU 355.1	NAHE 290.3	0.305	LAW 312.1	SCI 222.7	.029*	DOC 345.6	OTH 325.5	.439	SEN2 366.6	MID2 333.3	.844	2.32 / 7	0.455
PF6	The institution encourages learning and innovation at all levels	ACTU 360.8	NAHE 306.8	0.101	LAW 290.8	SCI 252.7	.785	MAS 349.7	DOC 331.6	.528	SEN1 353.4	SEN2 212.8	.244	2.24 / 12	0.441
PF7	The institution has effectively implemented a system that provides social justice to all stakeholders	NAHE 374.0	ACTU 316.3	0.069	PHAR 325.6	ECON 226.8	.018*	OTH 361.5	MAS 313.9	.020*	SEN1 356.8	SEN2 266.6	.590	2.04 / 17	0.425
PF8	Stakeholder engagement is linked to the strategic plans of the organization	ACTU 366.1	NAHE 246.6	0.006*	LAW 304.6	ENGG 252.8	.582	DOC 351.2	OTH 330.9	.468	SEN1 397.8	YO 328.5	.122	2.33 / 6	0.447

PF9	Individual goals and training are linked to the goals of the institution	ACTU 373.5	NAHE 249.1	**0.000** **	DENT 294.2	PHAR 221.4	.356	MAS 348.1	OTH 322.7	.314	MID2 346.1	SEN2 256.00	.879	2.48 /2	0.476
PF10	Individual and team contributions to the organization's success are recognised, valued and rewarded	ACTU 359.5	NAHE 289.2	0.138	LAW 303.4	ECON 241.9	.116	DOC 345.3	OTH 335.9	.829	MID2 353.8	SEN2 296.5	.700	2.25 / 11	0.442
PF11	Accurate and adequate information is provided to all staff	ACGU 340.4	STU 337.7	0.994	LAW 307.4	PHAR 228.1	.075	DOC 349.2	OTH 327.9	.461	MID2 363.2	SEN2 236.1	.049*	2.18 / 13	0.435
PF12	Feedback is collected by the institution about its activities from external stakeholders	ACTU 357.6	STU 315.1	0.175	LAW 306	MED 219.1	.056	MAS 352.4	DOC 332.3	.415	MID2 357.0	SEN2 296.6	.341	2.28 / 9	0.453
PF13	The organization's contribution to the community is considered important	ACTU 307.1	NAHE 296.2	**0.000** **	LAW 289.3	ARTS 242.4	.522	MAS 347.1	OTH 325.6	.436	SEN1 359.6	SEN2 286.8	.857	2.33 / 5	0.453
PF14	Formal feedback is collected from staff and students	ACTU 359.3	NAHE 289.5	0.117	DENT 310.3	PHAR 237.0	.486	DOC 354.4	MAS 325.9	.224	SEN2 367	SEN1 325.1	.524	2.29 / 8	0.448
PF15	Data about satisfaction and morale is collected	STU 353.3	NAQC 345.8	0.292	LAW 300.9	ARTS 246.4	.463	DOC 350.8	MAS 331.9	.470	SEN1 353.0	YO 331.9	.765	2.05 / 15	0.406
PF16	There are clear mechanisms for groups with similar roles to meet and discuss quality issues	ACTU 356.3	NAQC 311.3	0.185	DENT 334.6	ARTS 250.1	.333	OTH 354.3	MAS 325.6	.256	YO 382.9	SEN1 302.2	.045*	2.17 / 14	0.428
PF17	The organization has a clear focus on the continuous personal development of its employees.	NAQC 364.0	NAHE 307.0	0.250	ENGG 287.3	ARTS 238.4	.704	OTH 348.3	MAS 323.1	.239	SEN2 417.3	MID1 327.6	.260	2.04 / 16	0.413

Table 6.13: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under People Focus CSF (PF).

QAP No.	CATEGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		P
		High	**Low**		**High**	**Low**	
PF1	The involvement of stakeholders (Student, Staff, Parents, Society) is important to the institution	F 347.8	M 335.9	.434	TRIP 359.2	GHAR 312.4	.001**
PF2	Feedback on quality related matters is communicated to all staff and students	F 349.7	M 335.1	.337	TRIP 359.7	GHAR 311.8	.001**
PF3	Quality awareness is effectively implemented among staff and students	M 343.1	F 331.0	.429	TRIP 364.3	GHAR 305.5	**.000****
PF4	The role of academic supervisors in quality is considered important	M 340.8	F 336.5	.874	TRIP 369.8	GHAR 299.1	**.000****
PF5	The institution provides a healthy and safe working environment to staff and students	F 341.7	M 338.6	.842	TRIP 347.7	GHAR 328.3	.174
PF6	The institution encourages learning and innovation at all levels	M 343.4	F 330.4	.384	TRIP 354.1	GHAR 319.8	.014*
PF7	The institution has effectively implemented a system that provides social justice to all stakeholders	F 343.6	M 337.7	.701	GHAR 356.1	TRIP 327.5	.046*
PF8	Stakeholder engagement is linked to the strategic plans of the organization	M 353.4	F 307.2	.003**	TRIP 353.9	GHAR 319.8	.019*

(* indicates p <= 0.05 and ** indicates p<= 0.005)

Table 6.14: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under People Focus CSF (PF)

QAP No.	CATEGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		P
		High	**Low**		**High**	**Low**	
PF9	Individual goals and training are linked to the goals of the institution	F 347.7	M 336.0	.456	TRIP 361.2	GHAR 3.9.7	**.000****
PF10	Individual and team contributions to the organization's success are recognised, valued and rewarded	M 346.9	F 322.3	.112	TRIP 353.1	GHAR 321.1	**.**027*
PF11	Accurate and adequate information is provided to all staff	M 348.3	F 319.0	.051	TRIP 343.1	GHAR 334.6	.539
PF12	Feedback is collected by the institution about its activities from external stakeholders	M 341.2	F 335.6	.721	TRIP 352.6	GHAR 321.6	.032*
PF13	The organization's contribution to the community is considered important	F 340.2	M 339.2	.947	TRIP 363.1	GHAR 307.1	**.000****
PF14	Formal feedback is collected from staff and students	F 355.3	M 332.7	.135	TRIP 350.4	GHAR 324.6	.066*
PF15	Data about satisfaction and morale is collected	M 343.9	F 329.2	.329	GHAR 352.2	TRIP 330.2	.117
PF16	There are clear mechanisms for groups with similar roles to meet and discuss quality issues	F 355.2	M 332.7	.138	TRIP 351.0	GHAR 323.7	.052*
PF17	The organization has a clear focus on the continuous personal development of its employees.	M 342.0	F 333.6	.584	TRIP 348.7	GHAR 326.8	.126

(* indicates p <= 0.05 and ** indicates p<= 0.005)

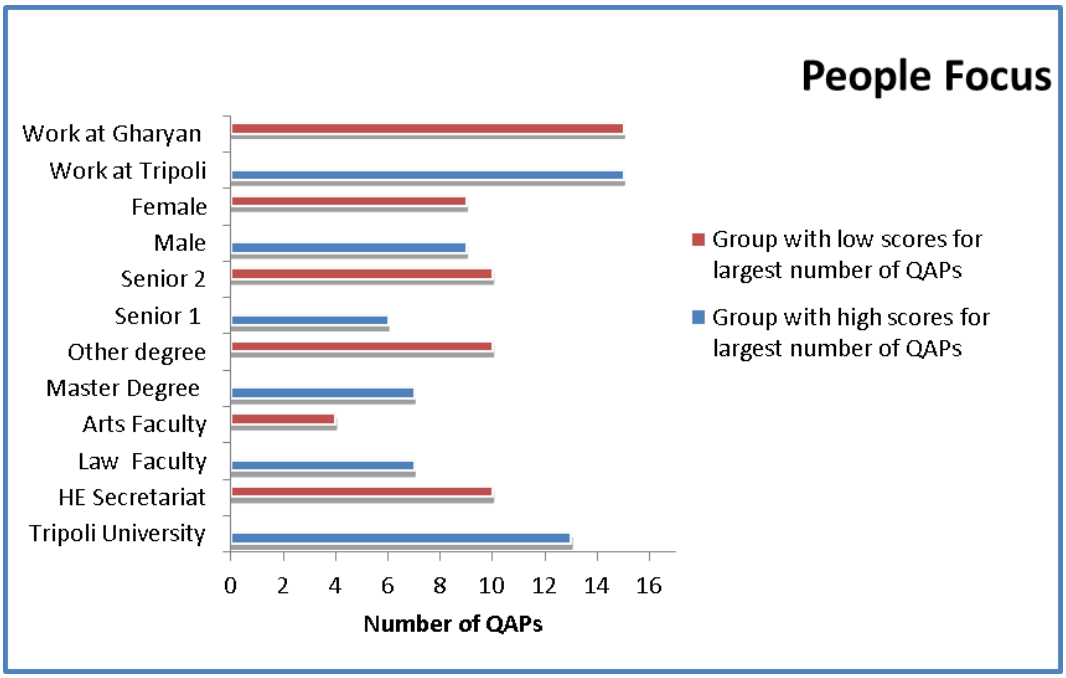

Figure 6.4: .Largest number of QAPs for which different groups have scored high or low KWMR (or MWMR) under People Focus CSF (from tables 6.12, 6.13, 6.14 &6.15)

Table 6.15.: Keyword content of responses gathered for indirect questions of semi – structured interviews under People Focus CSF (Tables 6.12, 6.13, 6.14)

Keyword	Linked to QAP	Number of occurrences	Awareness level
training	PF3	37	Above average
community	PF13	33	Above average
innovation	PF6	15	Above average
awareness	PF3	11	Above average
justice	PF7	10	Above average
benchmark	PF12	4	Below average
data	PF15	4	Below average
stakeholder	PF1	3	Below average
reward	PF10	1	Below average
feedback	PF2	0	Lacking
health	PF5	0	Lacking
safety	PF5	0	Lacking
Information	PF11	0	Lacking
morale	PF15	0	Lacking
		Average = 8.1	

Box 6.7.1 Social Justice and Transparency at the Libyan Higher Education System

Quantitative results have shown that for the QAP on Transparency (PS6) the Gharyan University and the Institution groups collectively have scored low and for the QAP on Social Justice (PF7) the Tripoli University has scored low but there are no significant differences observed between the collective Institutions (sections 6.5.1 and 6.5.3). In as much as these two values are important in Organizational Sustainability, they are interlinked this confirms the earlier discussion in the literature (section4.8). This implies that more transparency, contributes to more social justice. For example, one of the interview respondents quoted *the need for transparency in the allocation of financial resources* (section 6.5.3 ; Director of the Office of Quality at the University of Gharyan). Lack of transparency on this issue can result in Gap 2 presented in Table 5.1which means a gap between management perceptions of quality and service quality, due to favouritism in resource allocations which in turn can lead to social injustice

Libyan higher education leaders positioned at various levels of the system, repeatedly, insisted on full transparency; some examples are quoted below:

...provide full transparency in administrative work... – (Minister of Higher Education and scientific Research).

*...address the weakness of financial resources allocated for development ... there is a need for evolving clear criteria for assessment with a commitment to transparency in the development and application of policies... (*Director of the Office of Quality at the University of Gharyan).

To a further question as to why there is a lack of transparency, some respondents pointed out that existence of administrative corruption and dishonest staff;

...another factor that can lead to the successful implementation of sustainable development is transparency, which aims to eliminate administrative corruption through honesty and clarity; accountability and ethical considerations in managerial and administrative performances because these reflect on people's lives (Director of graduate studies at the University of Tripoli.).

For the questions on these two issues (Transparency and social justice) a majority of groups did not show significant differences, but when universities scored low on these QAPs is a matter of concern which is also supported by below-average scores for keyword content in Table 6.7 indicating a low awareness on this subject. The ethical dimension of sustainability is included in questions relating to areas such as health and safety (PF5) and Social Justice (PF7); these have already been outlined in the sustainability strategy of some UK universities (section 6.6). The Five Capital model views these activities as a matter of strengthening human capital (section 4.7.2). And identifies an area for fundamental change among the stakeholders of Libyan higher education. Elsewhere this is part of the social dimension within the TBL.

6.8 Summary

This chapter began with a discussion on the explanation of the statistical tests undertaken for analysing the questionnaires and semi-structured interviews. Subsequently, combined quantitative and qualitative analysis was presented under four Critical Success Factors (CSFs).

The data gathered from 72 survey questions were analysed statistically and was presented with reference to 26 study groups under six categories. The analysis summarised the high and low levels of implementation of QAPs and significant differences in observation among various groups under the four CSFs. These quantitative results were compared, verified and validated using the qualitative data, and the literature presented in chapters 2, 3, and chapter 4.

In the next chapter the discussion and findings pertaining to the remaining four Critical Success Factors (CSFs) are presented.

Chapter 7 Quality, Sustainability and Actuality: Perceptions of The Libyan Stakeholders - Part II

7.1 Introduction

Following on from chapter 6, this chapter presents the discussion and findings pertaining to Critical Success Factors - Customer Focus, Process Management, Training and Key Results. Data used for the analysis include the quantitative data gathered through the questionnaire survey and its links to the findings of the exploratory literature survey and the semi – structured interviews. Various methods followed within the domains of quantitative and qualitative data focused on verification and validation through mixed methods techniques described in section 3.8 ; sections 7.2 to 7.5 are an account of the discussion and findings derived from a combined quantitative and qualitative data analysis of the four CSFs as follows: 7.2 - Customer Focus, 7.3 - Process Management, 7.4 - Training and 7.5 - Key Results. In section 7.6 The Significant differences among various institutions, section 7.7 - Group Averages for CSFs (GACs) and their ranks are presented in CSF - rank order and group followed by frequency charts of the GAC ranks across CSFs and group categories. In addition, the correlation matrices for CSFs and the Sustainability Index are discussed in this section which is followed by a chapter summary.

7.2 Customer Focus

One of the characteristics of quality is that it should conform to customer requirements (Crosby, 1979; section 5.7). TQM embraces all activities to meet the needs and expectations of the customers (Li et al., 2003). Four QAPs (CF1 to CF4) presented in Table 7.1 are related to these activities and the fifth QAP (CF5) considers whether the students can be considered as customers of higher education. Statistical test results pertaining to these QAPs are presented in Table 7.1, Table 7.2 and Figure 7.1. Among this Table 7.1 presents the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by Group Average of a quality action programme (GAQ), rank of the GAQ within the Customer Focus CSFs and Sustainability Index (SI). Table 7.2 presents the Mann Whitney statistics for gender and location groups (two groups each). Figure 7.1 summarises Table 7.1 and Table 7.2 by

showing groups that have high or low scores for largest number of QAPs. Table 7.3 then presents the results of the keyword content analysis pertaining to the Customer Focus (CSF).

7.2.1 Students Feedback and Processing

For student requirements and feedback (CF1) in all issues that related to customer focus critical success factures, the KWMR and MWMR tests have shown interesting significant differences among qualification and location groups. Although this concept's visibility is high at the Quality Centre, it has not reached its full potential at the universities see also (section 6.6.1). A secondary issue is how the feedback data is used for further improvements (CF4). Past studies have indicated that the feedback data is seldom processed for further improvements of educational output. In the two Universities studied, the researcher could not find documentation on how the feedback data obtained from the students are further processed or what actions are taken based on the feedback data. A Director of graduate studies at Tripoli University observed that every University and college has a quality department but they have inadequate expertise to handle quality data:

Indeed, there is a whole section of the Quality Management Department at the University of Tripoli and offices of quality in every college affiliated to the University and the presence of staff in each of these offices is visible not only at the University of Tripoli but also in all Libyan universities; but unfortunately, the staff of these departments and offices do not have the knowledge and experience of quality tools...

These quality offices do not have a regular program for collection of feedback data but even the data collected occasionally is not done through a standard format or a robust framework;

...Occasionally direct feedback is collected from students, staff and faculty members by the concerned department of the college; but many of these are temporary programs about course materials, schedule of examinations and final results; in general feedback from parents is centred around rejection of their children in college as a result of certain matters relating to regulations; feedback from the community is mostly regarding the acceptance of teaching assistants and new faculty members. Both

administrative and faculty members are involved in these activities (faculty member in the faculty of Account at Gharyan University.).

Table 7.1: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Customer Focus CSF (CF)

QAP No.	CATEGORY >>	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p		
		High	**Low**		**High**	**Low**		**High**	**Low**		**High**	**Low**			
CF1	There is effective planning of quality that is based on student requirements and feedback	NAQC 383.4	NAHE 316.9	0.182	DENT 299.8	PHAR 227.4	0.116	OTH 367.1	MAS 316.8	.017*	SEN2 417.3	MID1 327.6	.067	2.01 / 5	0.409
CF2	Involvement of staff and students in the wider community is considered important by the organization	ACTU 377.2	ACGU 298.2	**0.000****	DENT 354.5	PHAR 213.8	**.**005**	OTH 371	DOC 296.9	**.000****	SEN2 393.5	MID2 304.0	.001**	2.15 / 3	0.438
CF3	Monitoring, understanding and improving the perception of the organization by its members is considered important	NAQC 414.1	ACGU 301.3	**0.000****	DENT 314.2	EDU 246.0	0.535	OTH 373.2	DOC 305.4	**.000****	SEN2 422.6	SEN1 280.3	.002**	2.05 /4	0.426
CF4	Performance data are effectively used to improve the educational services and output	ACTU 362.8	NAHE 304.5	0.041	DENT 289.2	EDU 248.3	. .771	MAS 359.o	DOC 313.4	.014*	SEN2 381.00	SEN1 290.9	.282	2.21 / 2	0.441
CF5	The management of the institution considers students as customers	ACTU 389.7	ACGU 292.6	**0.000****	ECON 291.4	EDU 237.6	.531	MAS 364.1	DOC 307.8	.003**	YO 350.4	SEN2 213.1	.189	2.27 / 1	0.449

(* indicates p <= 0.05 and ** indicates p<= 0.005)

Table 7.2. High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under Customer Focus CSF (CF)

QAP No.	CATEGORY >>	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		p
		High	Low		High	Low	
CF1	There is effective planning of quality that is based on student requirements and feedback	M 346.2	F 324.0	.148	TRIP 348.4	GHAR 327.3	.140
CF2	Involvement of staff and students in the wider community is considered important by the organization	F 347.0	M 336.3	.473	TRIP 365.2	GHAR 304.3	**.000****
CF3	Monitoring, understanding and improving the perception of the organization by its members is considered important	F 347.8	M 335.9	.431	TRIP 365.7	GHAR 303.5	**.000****
CF4	Performance data is effectively used to improve the educational services and output	M 340.7	F 336.7	.792	TRIP3353.8	GHAR320.0	.018*
CF5	The management of the institution considers students as customers	M 341.9	F 333.8	.599	TRIP 371.8	GHAR 295.2	**.000****

(* indicates p <= 0.05 and ** indicates p<= 0.005)

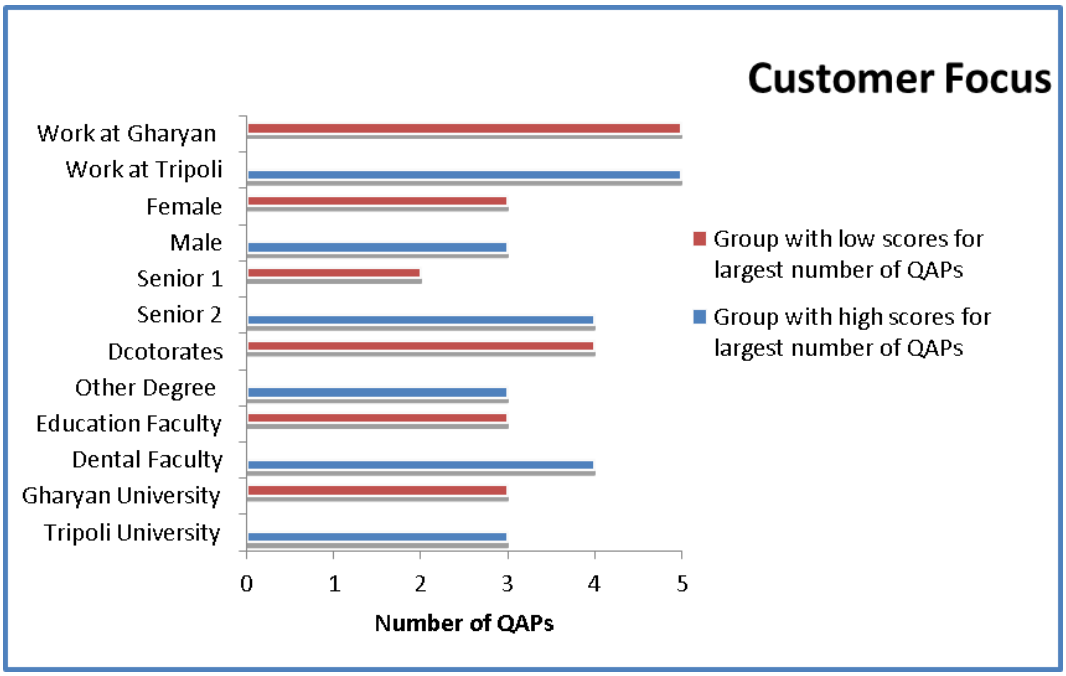

Figure 7.1: Largest number of QAPs for which different groups have scored high or low (KWMR or MWMR) under Customer Focus CSF (from tables 7.1 & 7.2)

Table 7.3: Keyword content of responses gathered from indirect questions of semi – structured interviews under Customer Focus CSF (Tables, 7.1 & 7.2)

Keyword	Linked to QAP	Number of occurrences	Awareness level
performance	CF4, KR2, KR3	52	Above average
community	CF2	33	Above average
output	CF4	19	Above average
planning	CF1	15	Below average
customer	CF5, LD2	7	Below average
perception	CF3	3	Below average
feedback	CF2	0	Lacking
		Average = 18.4	

The above observations reveal that the feedback data collection tools and techniques are rudimentary and this is yet another confirmation of the prioritizing quality training requirements. Table 7.3 shows that the keyword "feedback" is absent in response to the indirect questions, which leads to the inference that awareness is lacking on this issue see also (section 6.6.1).

7.2.2 Campus and the Community

Significant differences are evident on issues relating to the involvement of staff and students in the community (CF2) and the role of members in understanding and improving perceptions of the organization (CF3). These QAPs are also linked to PF13 that asked about an organisation's contribution to the community; for which the Tripoli University has a high score. A discussion presented on this aspect in section 6.7 identified three types of community activities that are perceived in the higher education context, based on the interview responses. It is inferred that the differences observed in the quantitative analysis confirm these variations perceived by the respondents. However, the frequent occurrence of the word "community" in Table 7.3 implies that Libyan stakeholders are generally aware of this matter in the higher education context.

7.2.3 Are Students' Customers of Higher Education?

Past studies exploring whether students should be considered as customers of higher education (CF5) have shown mixed responses in different parts of the world (section 4.5

). In this study responses to this question also varied across the groups; high and low scores were noted and significant differences were observed between the following groups (a) Academic staff at Tripoli and Gharyan universities (b) Master's level and doctoral level qualifications (C) All staff working in Tripoli and Gharyan. A Director in Tripoli University indicated on the change in quality outlook in the university by stating:

Patterns of (a) and (c) mentioned above are common as seen in previous CSFs as perception differences at national and regional levels, high scores by Master's level (junior staff) and low ones by doctorates and seniors leadership can be possibly be explained by the former retain links with the student community and the latter being secretive and protective of their position. Considered leadership as conservative perceptions among (b), this indicates that there is a wide gap in observation between (Senior 1 and Senior 2) as Doctors and Master's degree level staff members because most of the responses suggested that the seniors are more cautious about their observation due to their experience in the academic system.

Under these CSFs the institution, qualification, location and age groups have high significant differences for a majority of questions. Top two groups which have scored high mean ranks are those working at Tripoli University and older seniors. Top two groups which have scored Low include doctors and those working at Gharyan University (Figure 7.1, Table 7.1 & Table 7.2).

7.3 Process Management

Generally, a process is considered as a sequence of activities; however, discussions presented in section 5.8 lead to the inference that in the SQM perspective sustainability itself can be seen as a high-level process that integrates the TBL dimensions (Isaksson and Wiklund, 2001). Therefore the SQM processes are required to be designed at organizational, environmental and societal levels (section 4.7); seven QAPs listed in Table 7.4 are related to processes in the SQM perspective. Statistical test results pertaining to these QAPs are presented in Table 7.3, Table 7.4 and Figure 7.2. Among these Table 7.4 presents the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by Group Average

of a QAP (GAQ), the rank of the GAQ within the Process Management CSF and Sustainability Index (SI).Table 7.5 presents the Mann Whitney statistics for gender and location groups (two groups each). Figure 7.2 summarises Table 7.4 and Table 7.5 by showing groups that have scored high or low for a largest number of QAPs. Table 7.6 presents the results of the keyword content analysis pertaining to QAPs of Process Management CSF.

7.3.1 Addressing the Barriers to Sustainable Quality

Significant differences have been observed among institution and location groups about the ability of institutions to address the barriers to quality and sustainability (CSF (PM1)). Tripoli University has scored high when compared with Gharyan University and the Top three groups which scored high KWMR are those working at Tripoli, male respondents and academic from Tripoli University. The two Top scoring groups are those working at Gharyan and female respondents (Figure 7.2). Identifying and addressing barriers across departments is depicted by the question PM. Being a new concept sustainability-oriented approaches have experienced barriers across many sectors (section 4.8). In the Libyan higher education context even some political issues are considered as barriers to learning attitudes and an example can be cited for learning English at the universities; most students still insist that they should be taught in the Arabic language, which is their mother tongue (ELhensheri, 2004).

One of the Deming's principles suggests that teamwork is necessary for breaking the barriers towards innovation; this is related to the involvement of all stakeholders - a question raised under People Focus CSF (PF1). For this case, the Tripoli University has high KWMR and Gharyan University a low score. Similar results were obtained for the case of PM1, among the institution groups and this supports the observations from PF1. Apart from teamwork, other barriers were identified by respondents:

> *Barriers to implementation of Quality Programs are central decision-making, reliance on traditional tools and techniques, lack of access to appropriate funding and resistance to change for fear of revealing defects***,** (Director of Quality in the Faculty of Medicine at the University of Gharyan)
>
> *.... lack of dedicated financial resources, absence of a legislation binding quality with all concerned and limited authority to the quality offices at the universities*

are some of the barriers; there are difficulties in communication process between branch offices of some universities and the quality office at the headquarters of the (Director of quality management at Quality Assurance and the accreditation Centre in Tripoli.).

In addition, to the above respondents also identified other barriers such as the effect of tribal cultures that influences administrative decisions, lack of performance evaluation criteria that affects staff motivation, lack of financial resources and personal bias of some senior managers.

Table 7.4: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Process Management CSF (* indicates p <= 0.05 and ** indicates p<= 0.005)

QAP No.	CATEGORY >>	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p		
		High	Low		High	Low		High	Low		High	Low			
PM1	The institution has implemented a programme for identifying and addressing barriers across various departments	ACTU 364.0	ACGU 305.9	**0.002****	LAW 296.8	ENGG 241.7	.282	OTH 345.6	MAS 336.6	.832	YO 349.7	SEN2 200.8	.207	2.28 / 2	0.460
PM2	There is a clear and effective process for reviewing education standards	ACTU 371.1	ACGU 297.6	**0.000****	ENGG 295.7	ARTS 231.8	.205	OTH 364.0	DOC 315.1	.018*	SEN2 385.5	SEN1 304.1	.016*	2.17/7	0.439
PM3	There is a clear and effective process for monitoring and maintaining equipment and facilities	ACTU 356.6	ACGU 321.0	0.267	DENT 307.3	ARTS 229.7	.009*	MAS 359.1	DOC 321.2	.077	YO 353.3	SEN2 227.1	.467	2.20 / 6	0.445
PM4	The teaching and research programmes of the institution are stable (not subject to constant change)	ACTU 373.2	NAQC 299.3	**0.000****	MED 295.4	ARTS 218.9	.074	DOC 345.7	OTH 334.9	.798	YO 349.8	SEN2 283	.927	2.27 /3	0.452
PM5	There is good quality automated support for education processes (such as online learning, examination, admissions etc.)	ACTU 376.6	NAHE 285.0	**0.000****	MED 309.7	SCI 240.0	.486	MAS 343.3	OTH 333.6	.853	SEN2 431.8	SEN1 286.3	.144	2.34 /1	0.460
PM6	Processes for protecting natural resources and environmental conservation are clear and effectively implemented on the campuses	ACTU 358.3	ACGU 319.6	0.174	ARTS 304.9	SCI 233.2	.082	MAS 354.0	DOC 325.7	.231	SEN2 371	YO 321.2	.692	2.27 / 4	0.456
PM7	Performance indicators and outcomes of the institution are clearly linked to strategic goals	NAQC 353.8	NAHE 303.7	0.235	ECON 305.5	DENT 235.7	.133	MAS 352.3	DOC 322.0	.164	MID1 349.3	SEN2 303.5	.603	2.24 / 5	0.449

Table 7.5: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under Process Management CSF (* indicates p <= 0.05 and ** indicates p<= 0.005)

	CATEGORY >>	**GENDER**			**LOCATION**		
	Question on the QAP	GROUP / MWMR		**p**	GROUP / MWMR		**p**
		High	**Low**		**High**	**Low**	
PM1	The institution has implemented a programme for identifying and addressing barriers across various departments	M 340.7	F 336.8	.786	TRIP 362.6	GHAR 307.9	**.000****
PM2	There is a clear and effective process for reviewing education standards	M 344.1	F 328.7	.313	TRIP 366.9	GHAR 302.0	**.000****
PM3	There is a clear and effective process for monitoring and maintaining equipment and facilities	M 339.7	F 339.1	.972	TRIP 356.3	GHAR 316.5	.005*
PM4	The teaching and research programmes of the institution are stable (not subject to constant change)	M 344.9	F 327.1	.244	TRIP 364.6	GHAR 305.0	**.000****
PM5	There is good quality automated support for education processes (such as online learning, examination, admissions etc.)	F 344.0	M 337.6	.678	TRIP 361.2	GHAR 309.8	**.000****
PM6	Processes for protecting natural resources and environmental conservation are clear and effectively implemented on the campuses	M 341.7	F 334.5	.633	TRIP 351.9	GHAR 322.5	.037*
PM7	Performance indicators and outcomes of the institution are clearly linked to strategic goals	M 340.7	F 336.8	.802	TRIP 349.1	GHAR 326.4	.108

7.3.2 Use and Maintenance of Facilities

For responses about having adequate facilities and maintaining them (PM3) there are significant differences between faculty groups and requirements that certain standards are followed, particularly regarding rapidly advancing technologies such as e-learning systems, LCD projectors and digital laboratory equipment. The higher education quality assurance agencies in many countries have set clear standards for the equipment used (for example QAHEL in Lebanon and QAAC in Egypt). Sustainability is also linked to the use of equipment, as harmful emissions and wastes are released from them to the

environment (Taddese and Osada, 2010). Hence the above question is linked to CI7 that was discussed in section 6.6.5 ; it was inferred that for neutralising harmful wastes the academic groups scored lower than the quality centre. Therefore, even though the Tripoli University and Dental faculties have scored high for PM3, it may not be a reality in the sustainability angle. In addition, low scores for Gharyan University and arts faculty for this question indicates that the standard of equipment and level of maintenance is lacking. This is also supported by the absence of the keywords "automation" and "learning" in Table 7.6

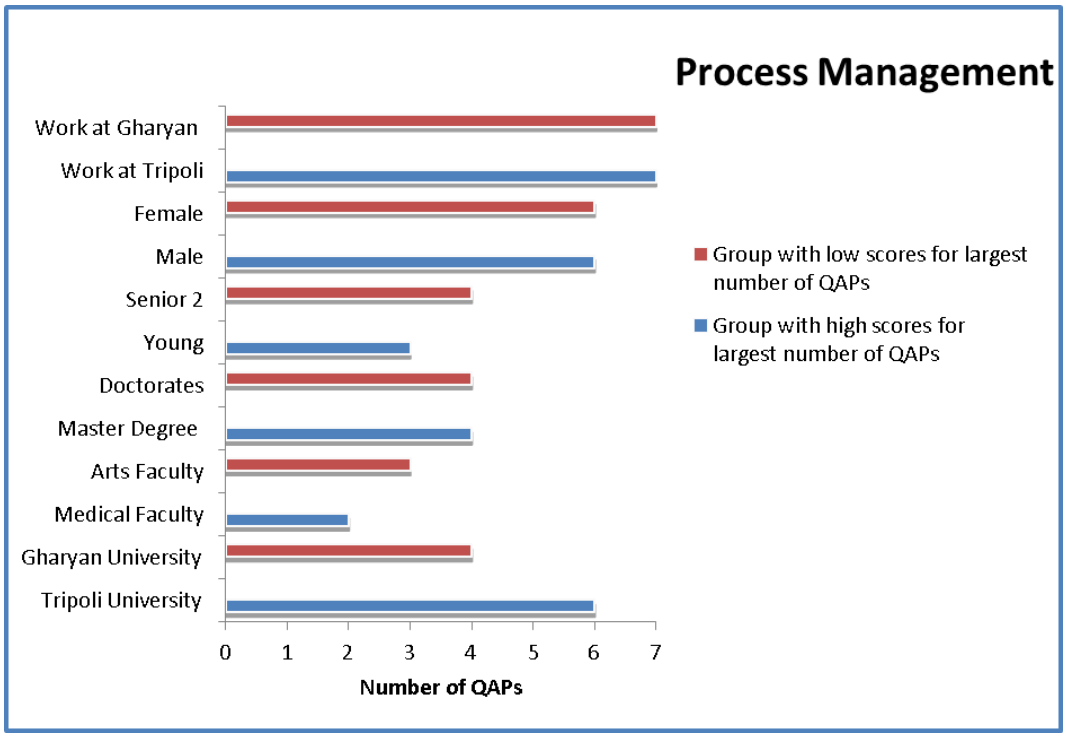

Figure 7.2: Largest number of QAPs for which different groups have scored high or low KWMR (or MWMR) under Process Management CSF from Tables 7.4 &7.5.

Table 7.6: Keyword content of responses gathered for indirect questions of semi – structured interviews under Process Management CSF (Tables 7.4 & 7.5)

Keyword	Linked to QAP	Number of occurrences	Awareness level
Environment	PM6	85	Above average
Performance	PM7	52	Above average
research	PM4	51	Above average
teaching	PM4	25	Above average
Review	PM2	13	Below average
Natural	PM6	7	Below average
Monitor	PM3	5	Below average
Maintain, Maintenance	PM3	5	Below average
Conservation	PM6	2	Below average
Barrier	PM1	1	Below average
Stability	PM4	1	Below average
Internet	PM4	1	Below average
Automation	PM3	0	Lacking
ELearning	PM4	0	Lacking
		Average = 17.7	

7.4 Training Program

Training refers to the planned and systematic development of knowledge and according to Crosby (1979) quality defects arise due to lack of knowledge. The gap analysis presented in section 5.9 indicated that quality awareness is lacking even among the senior managers in Libya. Three QAPs were studied under this CSF Table 7.7 and Statistical test results pertaining to them are presented in Table 7.7, Table 7.8 and Figure 7.3. Among these Table 7.7 presents the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by Group Average of a QAP (GAQ), the rank of the GAQ within the Training CSF and Sustainability Index (SI). Table 7.8 presents the Mann Whitney statistics for gender and location groups (two groups each). Figure 7.3 summarises Table 7.7 and Table 7.8 by showing groups that have scored high or low for a largest number of QAPs. Results of keyword content analysis pertaining to the training QAPs is presented in Table 7.8.

Table 7.7: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Training CSF (TR)

QAP No.	CATEGORY >>	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p		
		High	Low		High	Low		High	Low		High	Low			
TN1	Stakeholders of the institution have good awareness of total quality management	NAQC 370.3	NAHE 320.0	0.513	DENT 283.0	PHAR 207.7	.041*	MAS 352.5	DOC 316.6	.036*	MID1 362.5	SEN2 153.5	.005**	2.07 / 1	0.419
TN2	There is effective training on statistical quality controls and quality circles to the staff involved at all levels of the organization	NAQC 383.1	ACTU 334.4	0.635	PHAR 292.1	ECON 219.2	.016*	OTH 356.1	MAS 319.9	.100	MID2 352.8	SEN2 200.8	.530	1.94 / 3	0.402
TN3	Continuous professional development (CPD) is seen as important by the organization	ACGU 340.0	NAQC 334.3	0.995	LAW 293.1	ARTS 234.4	.211	DOC 351.1	MAS 320.3	.131	YO 353.8	SEN2 284.6	.783	1.99 /2	0.398

(* indicates p <= 0.05 and ** indicates p<= 0.005)

Table 7.8: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under Training CSF (TR)

QAP No.	CATEGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		p
		High	Low		High	Low	
TN1	Stakeholders of the institution have good awareness of total quality management	F 354.4	M 331.1	.138	TRIP 348.4	GHAR 327.3	.113
TN2	There is effective training on statistical quality controls and quality circles to the staff involved at all levels of the organization	F 342.0	M 338.4	.813	TRIP 340.6	GHAR 338.1	.859
TN3	Continuous professional development (CPD) is seen as important by the organization	F 347.7	M 336.0	.439	GHAR 343.9	TRIP 336.3	.591

(* indicates p <= 0.05 and ** indicates p<= 0.005)

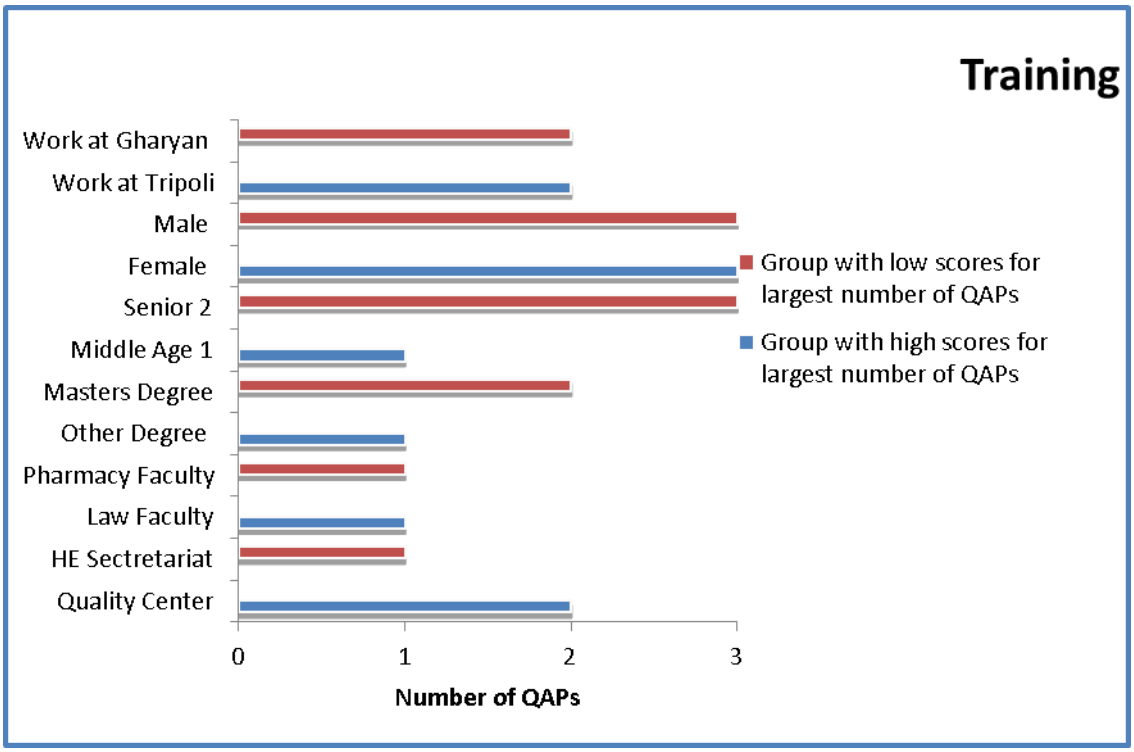

Figure 7.3: Largest number of QAPs for which different groups have scored high or low (KWMR or MWMR) under Training CSF from tables 7.7 & 7.8

7.4.1 TQM Awareness and Training Requirements

For question TN1 on TQM awareness of the stakeholders, there are no significant differences between the non- academic institution groups although there are between these and academic groups (faculty, qualification and age) indicating a lack of quality awareness and training requirements in the latter. Supporting evidence for this observation can be drawn from the correlation coefficient matrix presented in Table 7.18 which shows medium or low-level correlation of GAC scores of the universities due to shortage of quality training programs conducted in the academic Universities when compared with the Quality Centre (QC) and Higher Education Secretariat (HES). Similarly, for the case of TN2 on statistical quality control methods, the academic groups have low scores including Tripoli University which has performed well for a large number of the QAPs the discussed in the previous sections.

Table 7.9: .Keyword content of responses gathered for indirect questions of semi – structured interviews under Training CSF (Table 7.7&7.8)

Keyword	Linked to QAP	Number of occurrences	Awareness level
profession, Professional	TN3	16	Above average
Control	TN2	13	Above average
awareness	TN1,LD6, LD7	11	Above average
Statistics, statistical	TN2	3	Below average
Quality Circle	TN2	0	Lacking
		Average = 8.6	

Despite the above lacuna for the question on Continuous Professional Development (CPD; TNR) for which Gharyan University has scored high these observations highlight the need for initiating quality training at the Libyan universities.

Past TQM oriented studies have shown that Libyan public companies have difficulty in identifying the training needs of their employees and often this affected the skills required; and this in turn, affected the service provided (Agnaia, 1996). A common feeling among employees was that they do not have enough training to enable them to perform their job properly. At the same time, it was observed that quality trained top managers were highly motivated towards improvement (Youssef, 2006). Therefore, the need for stakeholder awareness on TQM and sustainability tools is important (TN1). Seniors at the Gharyan University expressed concern on this and pointed out the fact that they are developing training plans towards improvement:

*establishment of quality training programs is one of the key solutions to improve the creativity...(*Dean of the University of Gharyan)*...the need to keep pace with modern technologies in the training methods.... the Libyan universities suffers from a shortage of quality and skills among members of the faculty and staff. So we need to set up courses and training seminars on quality to get the best results.....* (Director of the Office of Quality at the University of Gharyan).

Apart from improving skills through quality training, a Director at the Quality management at Quality Assurance and the accreditation Centre in Tripoli suggested that the competencies of the professors are also vital: *...the quality of education also depends on the quality of faculty and scientific competencies; a professor assesses his*

significance from academic competence and research capabilities apart from teaching...

The above statement is also linked to the discussion on inadequate recruitment selection criteria of academic staff in the past (section 6.6). However, some academic staff members were sceptical of the view that they should get trained in quality management functions outside of academic responsibilities. A faculty member in faculty of medicine at Tripoli University

Tripoli University stated:*...in my capacity as a doctor I have not much to do with administrative work; ....there are people who specialise in management....but as a doctor who specialises in the field of medicine I deal with the patients and diseases only as that is my area of specialization and that can benefit me and the nation...*

In the sustainability and quality context, it is stressed that the participation of all stakeholders is important and past studies have shown that this is an indicator of strong sustainability (section 4.7). For a question raised on this issue in (PF1), the Tripoli University scored highest indicating participation of all stakeholders. But the response quoted above raises the question whether a specialist in the institution should be involved in quality matters or not. Another response from the same university clarifies this (Head of Faculty of Economics at Tripoli University)

:*....it is necessary to pursue the development of skills of staff members in the institutions of higher education in teaching and administrative roles; as they carry out their roles and responsibilities they can also play a role in achieving quality*.

The weakness in the QAP related to professional development (TN3) was accepted by a Director at the Quality Assurance and the accreditation Centre in Tripoli, *who insisted that more training courses need to be implemented on professional development*.

Although the above statements refer to the need for improvements related to training, a keyword search of all interview responses revealed that specific references to statistical quality control charts or quality circles (TN2) were unavailable (Table 7.9). This leads to the conclusion that knowledge on the existence of such quality systems is limited and as discussed in sections 6.4 and 6.6 attention should be paid to training senior management. The fact that four instances of Gap 3 were identified in section 5.9 , Table 5.8 on these aspects shows that the gap between service quality and service delivery

exists for training related QAPs in the Libyan government, quality centre and university systems (Table 5.1).

7.5 Key Results

The key concepts considered in this study are based on the EFQM questionnaire 2010 model and a detailed discussion on how various components of this model are linked to the PDSA and the Five Capital model was discussed in chapter 5. Detailed tables on these links are presented in Appendix J. Questions linking PDSA and the Five Capital model with sub – criteria of the EFQM model were then added under appropriate CSF sub – headings and discussed in previous sections of this chapter and various sections of chapter 6 (for example, questions related to people results were added under People Focus CSF in section 6.7). Hence, in this section, only questions related to financial output and organisational performance are considered.

Under this CSF the five QAPs were considered for analysis as listed in Table 7.10 & Table 7.11. Statistical test results pertaining to these QAPs are presented in Table 7.10, Table 7.11 and Figure 7.4. Among these Table 7.10 presents the Kruskal Wallis statistics for institution, faculty, qualification and age groups (more than two groups each) followed by Group Average of a QAP (GAQ), the rank of the GAQ within the Key Results CSF and Sustainability Index (SI). Table 7.11 presents the Mann Whitney statistics for gender and location groups (two groups each). Figure 7.4 summarises Table 7.10 and Table 7.11 by showing groups that have scored high or low for a largest number of QAPs. A result of keyword content analysis pertaining to Key Results QAPs is presented in Table 7.12.

7.5.1 TBL Performance Evaluation

The TBL model of sustainable development can also be viewed through the 'key results' approach adopted in the EFQM model; (a) key financial results are related to economic sustainability (b) people results are related to social sustainability and (c) ecological results are related to environmental sustainability (Zink, 2007). Past studies have shown that in many academic institutions the financial outcomes and education output are not measured or compared with equivalent organisations (KR1 and KR3;

section4.5.2). In the case of Libya universities are often funded by local government and or international donors that limit review of financial outcomes to the number of students educated; this is more visible for the case where is the free education in Libya is predominant (section 2.5 ;2.6 And2.7).

Table 7.10: High and low scores of Kruskal-Wallis Mean Ranks (KWMR) and probability levels of significance for various QAPs under Key Results CSF (KR)

QAP No.	CATEGORY >>	INSTITUTION			FACULTY			QUALIFICATION			AGE			GAQ / Rank	Sustainability Index
	Question on the QAP	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		p	GROUP / KWMR		P		
		High	Low		High	Low		High	Low		High	Low			
KR1	Key financial and non- financial outcomes are compared with direct competitors or equivalent organization	NAQC 385.9	ACTU 306.9	**0.001****	EDU 305.3	PHAR 223.0	**.014***	OTH 344.7	DOC 335.9	.014*	SEN2 425	MID2 329.2	.748	1.77 /5	0.372
KR2	The performance of different departments and functions are taken into account when considering overall organizational performance.	NAHE 377.7	ACTU 321.7	0.169	MED 312.8	ARTS 237.7	.078	OTH 344.7	DOC 335.1	.078	SEN2 382	MID2 327.8	.508	1.84 / 3	0.383
KR3	The performance of activities(or processes) that directly contribute to educational output are effectively measured	NAHE 345.7	NAQC 311.9	0.737	PHAR 314.5	DENT 211.9	.049*	DOC 368.6	OTH 320.1	.049*	SEN2 406.5	YO 314.6	.071	1.86 /2	0.373
KR4	Educational support and administration activities (e.g. IT. Planning, security, etc)are improving	NAQC 406.5	NAHE 307.4	.087	PHAR 300.5	ARTS 233.8	.210	DOC 358.1	MAS 316.7	.034	YO 357.3	SEN2 202.00	.249	1.87 / 1	0.386
KR5	The environmental performance of the organization is improving steadily and is comparable with other similar organizations	NAQC 407.1	ACTU 326.4	0.047*	LAW 305.4	ARTS 244.3	.200	DOC 349.8	MAS 321.3	.200	SEN2 483.1	MID1 331.2	.457	1.81 / 4	0.384

(*indicates p <=0.05and **indicates p <= 0.005)

Table 7.11: High and low scores of Mann Whitney Mean Ranks (MWMR) and probability levels of significance for various QAPs under Key Results CSF (KR)

QAP No.	CATEGORY	GENDER			LOCATION		
	Question on the QAP	GROUP / MWMR		p	GROUP / MWMR		p
		High	**Low**		**High**	**Low**	
KR1	Key financial and non-financial outcomes are compared with direct competitors or equivalent organization	F 353.1	M 333.7	.188	GHAR 370.7	TRIP 316.7	**.000****
KR2	The performance of different departments and functions are taken into account when considering overall organizational performance.	F 342.9	M 338.1	.741	GHAR 348.0	TRIP 333.3	.273
KR3	The performance of activities(or processes) that directly contribute to educational output are effectively measured	M 342.0	F 333.6	.573	GHAR 348.8	TRIP 333.3	.289
KR4	Educational support and administration activities (e.g. IT. Planning, security, etc) are improving	F 348.2	M 335.8	.397	TRIP 347.4	GHAR 328.7	.171
KR5	The environmental performance of the organization is improving steadily and is comparable with other similar organizations	M 344.1	F 328.8	.288	TRIP 341.7	GHAR 336.4	.693

(* indicates p <= 0.05 and ** indicates p<= 0.005)

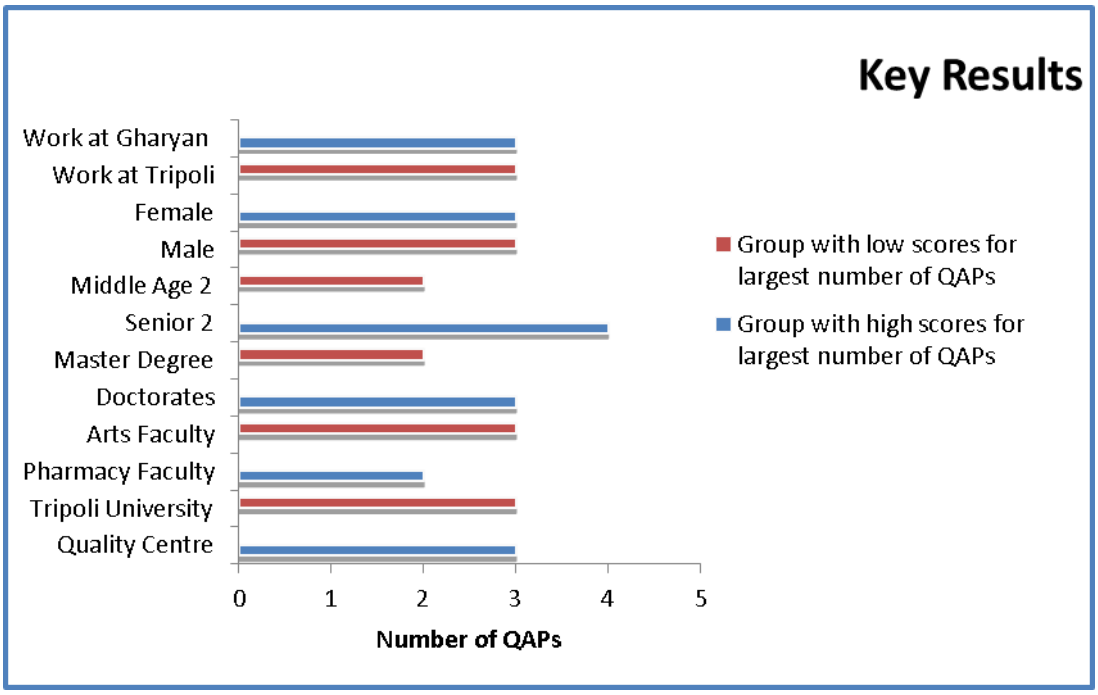

Figure 7.4: Largest number of QAPs for which different groups have scored high or low (KWMR or MWMR) under Key Results CSF

Table 7.12: Keyword content of responses gathered for indirect questions of semi – structured interviews under Key Results CSF (Tables 7.10 & 7.11)

Keyword	Linked to QAP	Number of occurrences	Awareness level
Compete, competition	KR1	21	Above average
Support	KR4	14	Above average
Compare, comparison	KR1	10	Below average
Outcome	KR3	9	Below average
		Average = 10.8	

Although the Quality Centre and Higher Education Secretariat have scored high for KR1 and KR3 respectively, lower scores of the two universities on these questions indicate that measuring financial outcome and education output are less visible in these institutions. The fact that none of the academic groups have scored high for any

question under this CSF supports the view that the Libyan government requires an urgent focus on measuring key financial performance results of the universities. In addition, for the case of environmental performance (KR5) the universities also havescores low, that supporting the observations in sections 6.5 and 6.6 . A Faculty member in the school of Education at Tripoli University commented:

I have not heard of professional tools such as quality circles or benchmarking being used for measuring performance. But I think certain traditional methods are being used; these may include annual academic report generated on faculty members, average scores of students and graduates and annual performance report of non – academic staff.

It is a matter of concern that the Key Results CSF has shown the lowest level of performance in the Libyan Higher education system (Table 7.13). To some extent this can be related to the global phenomenon that government funded academic institutions often ignore performance measurement (section 4.8). While this is also true for the case of economic performance, most interview responses did not lead to any robust framework for environmental and social performance evaluation and this is supported by the statement of a Faculty member in Faculty of Accounting at Gharyan University:

... Unfortunately, most educational institutions in Libya still look at the environmental or ethical performances as matter of specialised activity because their major interest is focused on academic matters only. It is a matter of concern that the internal environment at the colleges are maintained and the waste collected is either recycled or transferred to the concerned departments in the city.

The environmental performance considerations are sub – criteria of the EFQM model that has been adopted in many countries and Libyan higher educational institutions need to focus on these issues.

Box 7.5.1 Self-assessment or external evaluation

One of the interview questions focused on the method of evaluation that can be used in the Libyan Context. These need to

..Start from within the institution through the process of self-assessment and then visit to the institution to understand the ground realities... (Dean of the University of Tripoli.)

However, other statements by senior academic managers put across the opposite view:

…The existence of an entity or entities to assess the performance and quality assurance should be outside the administrative control of the institution (Director of Quality in the Faculty of Medicine at the University of Gharyan).

Quality should be measured by external evaluation through specialised technical committees, which examines all aspects of the basic quality standards required in the curriculum and learning environment (Director of Quality at the Faculty of Medicine at the University of Gharyan).

These opposing viewpoints are verifiable as the institution groups have scored with significant difference for the question on KR1 which deals with the issue of performance evaluation. Many past studies have however indicated that self – evaluation is an effective method particularly for higher education institutions (section 4.8). Another respondent suggested both internal and external systems can be used in an integrated fashion:

…We need to provide integrated quality tools and techniques which can help universities to achieve satisfactory results using both internal and external evaluation systems... and all decision makers in the universities should use such information while studying performance indicators (Director of Quality Management at Gharyan University).

The above statement also emphasises that follow – up activities should be initiated and awareness of the decision makers about quality assessment is vital. A Department Head in faculty of Law at Gharyan University opined out that expansion of the Libyan universities in terms of student output is an indicator of performance:

....the cities of Tripoli and Benghazi had only one university each in the past. Increasing population resulted in increasing the number of students; so recently five private universities have been established. A number of new faculties have been included on medicine, dentistry, pharmacy, applied medical sciences and nursing, engineering…

The expansions mentioned above are visible from the Libyan higher education statistics presented in section2.6 ; it can also be argued that the above response does not address the core question that pertains to quality evaluation from the sustainability perspective. It was concluded in Box 6.4.2 that quantitative expansion exploits human capital intensively can lead to weak sustainability. It is also opined by a Head of Faculty of Economic at Tripoli University that Privatization itself can weaken sustainability of government higher education institutions further:

...globalization has weakened the government support and increased the importance of privatization; as a consequence institutions of higher education are being asked to generate income from their own sources and as result, the differences between higher education institutions of government and private ones are increasingly blurred.

Box 7.5.2 Financial outcome and the Educational output

Outcome and output have different meanings; the former means result or consequence and the latter is related to yield or productivity. In this study the question KR1 dealt with the financial outcome of higher education institutions and KR2 was concerned about educational output. For both these QAPs non – academic institutions have scored high when compared to the academic groups. A Head at Faculty of Economic at Tripoli University suggested that one way of enhancing outcomes is through accreditation:

...There is growing pressure on the central associations and agencies that set standards to focus on institutional and accounting outcomes; many politicians and professionals look to accreditation as a means towards that ...

On the other hand, the Minister of Education opines that privatization of universities has already shown tangible outcomes:

...Libyan higher education institutions have chosen to go to the private sector for investment due to higher demand for enrolment that was steered by population growth; as a result the number of universities rose from seven to fourteen…

The relationship between outcome and output has to be critically achieved for enhancing and sustaining quality, as mentioned by Director of Quality at the faculty of Dentist at Tripoli University:

Quality implies continuity of excellence in educational outcomes, and that is defined as the ability of appropriate between the outputs of education and the labour market. And there it is used as an indicator for comparison between the value of output and the size of spending on education or as an indicator of return (tangible and intangible) for investment in education, and from there the view of quality in higher education as the ability to adapt to structural changes in the labour market.

7.6 Significant Differences among Institution Groups under the eight Critical Success Factors (CSFs) and seventy two Quality Action Programs (QAPs).

In this study, the Kraskal- Wallis and Mann Whitney statistical tests showed that there were statistically significant differences among various groups. However, the majority of results indicated that overall Tripoli University (ACTU) ranked higher when compared with Gharyan University (ACGH), non-Academic Institution Quality centre (NAQC) and Secretariat of the Higher Education (NAHE). However, Gharyan University ranked the lowest.

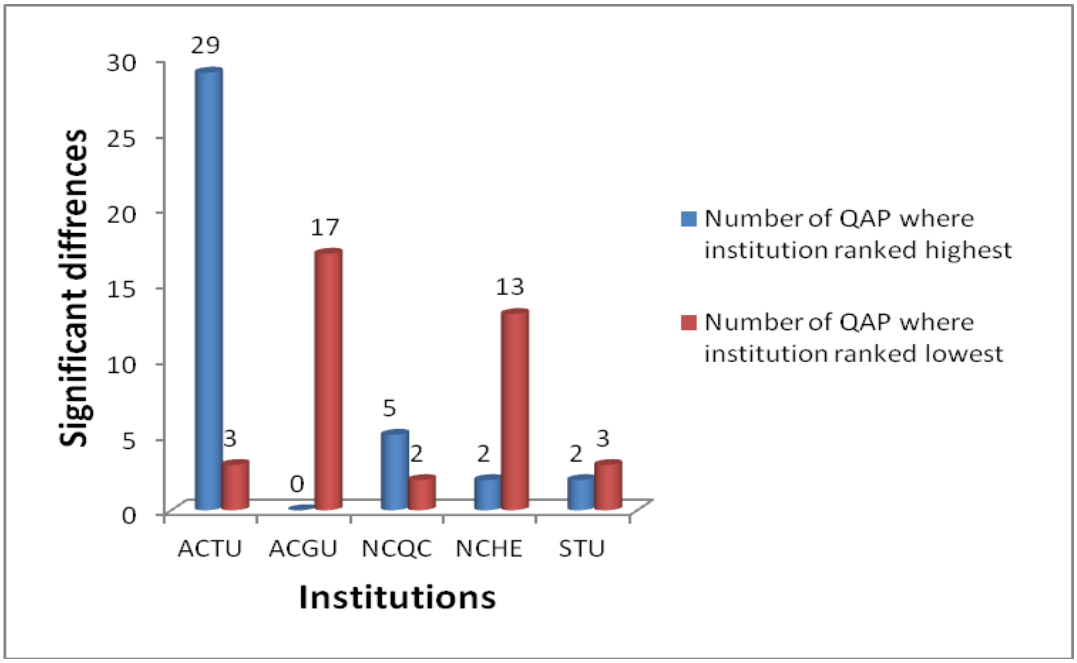

Figure 7.5: Significant Differences among Various Institutions Groups.

The main differences between the institution groups Tripoli and Gharyan Universities can be seen in Figure 7.5. These differences are also supported through the performance Group Average for Critical Success Factors (GAC) (Figure 7.6,Table 7.15). Reasons for these differences are presented and are based on the interview responses of experts in Libyan Higher Education System (see chapters six and seven).

1. Tripoli University has been a mainstream academic institution for a long time; it is the second oldest University in Libya and is located in the capital city, Tripoli. The University has good reputation for its quality academic activities

and is close to the national Quality Centre and Ministry of Higher Education. Most of the faculty members in Tripoli University are also members of the Quality Centre and the Ministry of Higher Education; these regularly participate in national and international conferences, seminars, and workshops which to enhance their knowledge on quality matters. It has managers knowledgeable in all colleges who are aware of issues in the quality management and sustainability.

2. Tripoli University promotes quality programs internally and offers these to external organisations (e.g. private sector- oil companies; public sector e.g. local schools).
3. Some faculties in Tripoli do undertake quality and sustainability seminars and workshops to support their teaching and research (e.g. dentistry, medicine, law); these can be seen to perform better in (Table 7.15;Table 6.12; section 6.7.3). Other departments however only undertake such activities when there is political gain and perform less well (e.g. economics, Arts, Pharmacy, Engineering; Table 6.12). The faculties that perform well also have allocated financial support for quality training programmes. They send students abroad to gain a higher qualification and staff on overseas sabbatical as part of their professional development.
4. Social justice and transparency in the financial process system have been highlighted in Tripoli University (section 6.5.3). Although, it situated in the city the University has initiated steps towards developing a green campus. This links the University and its training hospitals through a green campus that is available to patients and students.
5. The curriculum in Tripoli University is regularly reviewed as part of continuous improvement. In Gharyan much of the teaching and learning is repeated and not reviewed (section 6.6.4). Tripoli does however also suffer some barriers to continuous improvement due to lack of books, absence of electronic resources… etc. respondent highlight a cultural issue across Libyan Higher Education; this means students are often not encouraged to question or engage with their teachers.

6. The investment in human resources at Tripoli University is better than other Universities. Because there are many private and public sector organisations that recruit a large number of graduates. However, during 2011- 2012, the Ministry of Higher Education in Libya appointed hundreds of faculty members across the country without standard references or appropriate qualifications and experience (Director of Quality Management at Quality Centre in Tripoli).
7. There is no systematic feedback system in Libyan Higher Education. While Tripoli University does aim to get some and has a quality management office in all faculties there is inadequate expertise and training in quality tools such as statistical quality control, quality circles, and benchmarking to evaluate education quality system effectively. One member in the faculty of Education pointed out that while the University is seeking to adopt modern methods for performance evaluation it is still based on traditional assessment methods, including annual academic reports generated by faculty members, or non-academic staff inadequate information about the person being evaluated (section7.2.1).

7.7 Group Averages for Critical Success Factors

The group average scores presented in Table 7.13 are arranged in ranks in Table 7.14 for CSFs; these ranks are arranged according to groups in Table 7.15. These averages indicate the performance of a group on various CSFs. The ranks were further grouped based on frequencies falling in the top, middle and lower positions in Figure 7.6 to Figure 7.11. While the non – parametric test results were limited to reveal the trends at QAP level, the GAC ranks provide more insight into the CSF level performance of various groups.

Table 7.13: Group Average Scores for CSFs

Category	Leadership	Policy & strategy	Continuous Improvement	People Focus	Customer Focus	Process Management	Training	Key Results
Institution								
ACTU	2.23	2.35	2.28	2.37	2.29	2.73	2.02	1.8
ACGU	2.06	2.09	2.13	2.19	1.97	2.13	1.97	1.85
NAQC	2.25	2.33	2.16	2.37	2.24	2.22	2.04	1.93
NAHE	2.12	2.19	1.98	2.04	2.06	2.10	1.96	1.86
STU	2.2	2.16	2.15	2.25	2.07	2.26	2.00	1.92
Faculty								
ARTS	2.14	2.25	2.12	2.21	2.16	2.15	1.89	1.68
DENT	2.54	2.42	2.37	2.37	2.39	2.26	2.04	1.69
ECON	2.16	2.24	2.27	2.28	2.18	2.33	1.87	1.75
EDU	2.08	2.20	2.37	2.36	2.03	2.34	2.1	1.93
ENGG	2.23	2.28	2.18	2.26	2.32	2.25	2.07	1.76
LAW	2.27	2.24	2.30	2.44	2.54	2.33	2.15	1.91
MED	2.04	2.14	2.04	2.22	2.20	2.27	2.06	1.79
PHAR	2.07	2.15	2.05	2.26	2.03	2.33	1.89	1.74
SCI	2.09	2.22	2.09	2.22	2.03	2.12	1.98	1.80
Qualification								
DOC	2.08	2.14	2.20	2.31	2.01	2.20	1.99	1.88
MAS	2.26	2.28	2.23	2.27	2.20	2.28	1.98	1.80
OTH	2.17	2.24	2.15	2.22	2.24	2.26	2.03	1.83
Age								
YONG	2.18	2.25	2.14	2.23	2.28	2.28	1.98	1.81
MID1	2.23	2.26	2.21	2.26	2.16	2.27	2.03	1.81
MID2	2.13	2.19	2.20	2.30	2.07	2.24	1.99	1.86
SEN1	1.99	2.03	2.19	2.33	1.95	2.18	1.95	1.88
SEN2	1.26	1.49	1.88	1.96	2.20	2.10	1.44	1.93
Gender								
MALE	2.16	2.21	2.18	2.27	2.13	2.26	1.98	1.82
FEMALE	2.20	2.22	2.20	2.26	2.14	2.24	2.04	1.84
Location								
TRIP	2.24	2.30	2.25	2.34	2.24	2.02	2.02	1.82
GHAR	2.08	2.10	2.11	2.18	1.99	2.13	1.97	1.84

Among the institution groups Tripoli University and the Quality Centre have shown better overall performance (Figure 7.6). Gharyan university has shown overall lowest performance. These trends were validated in many sections of QAP level analysis in this chapter and chapter 6 and reasons for validated through mixed methods techniques.

Overall comparison across CSFs reveals that for Training and Key Results CSFs are frequently low ranked when compared other CSFs (Figure 7.7); these results corroborate with the findings of non – parametric tests for individual QAPs and many instances of interview responses presented in sections 7.4 and 7.5 . It also is observed

from Figure 7.7 that People Focus and Process Management are overall best performing CSFs in the Libyan higher education system. Policy and Strategy and Continuous improvement have shown medium level performance.

Among the faculties law, dental and education faculties have fallen in top ranks and economics, and engineering faculties are in the middle. To a related question on the quality position of various faculties the respondents mentioned that these faculties are doing better that others due to the following reasons (Interviews 25 to 27); (a) dental and law faculties are older than other faculties and they have developed quality procedures and processes to better levels through continuous improvements (b) financial resources available in these faculties are better than others.

In general, GAC ranks of Young and Middle Age are higher than the seniors. Interview responses have shown that this is related to the experience factor for the middle age and exposure factor for the young; the middle age is likely to have more experience on quality and sustainability matters and young respondents are exposed to modern internet based information that enables them aware of the complex issues related to sustainable development. Master's, males and those in Tripoli are falling in high frequencies in high ranks. This is supported by the statement of a faculty member:

Staff members of Tripoli University have better knowledge in education quality matters when compared to Gharyan University because of a higher level of quality awareness and transparency. These staff members also participate in quality centre activities and some of the senior staff of Tripoli University is also members of the National Education Quality Centre, which has facilitated enhancing quality tools and techniques of this university (faculty member in faculty of Account at Gharyan University)

Table 7.14 Critical Success Factors (CSFs) ranked according to Group Average Scores for CSFs (GACs) presented in Table 7.13

GAC Rank >>	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Institution								
Tripoli University (ACTU)	PM	PF	PS	CF	CI	LD	TR	KR
Gharyan University (ACGU)	PF	CI	PM	PS	LD	CF	TR	KR
Quality Centre (NAQC)	PF	PS	LD	CF	PM	CI	TR	KR
Higher Education Secretariat (NAHE)	PS	LD	PM	CF	PF	CI	TR	KR
Students (STU)	PM	PF	LD	PS	CI	CF	TR	KR
Faculty								
Arts (ARTS)	PS	PF	CF	PM	LD	CI	TR	KR
Dental (DENT)	LD	PS	CF	CI	PF	PM	TR	KR
Economics (ECON)	PM	PF	CI	PS	CF	LD	TR	KR
Education (EDU)	CI	PF	PM	PS	TR	LD	CF	KR
Engineering (ENGG)	CF	PS	PF	PM	LD	CI	TR	KR
Law (LAW)	CF	PF	PM	CI	LD	PS	TR	KR
Medicine (MED)	PM	PF	CF	PS	TR	LD	CI	KR
Pharmacy (PHAR)	PM	PF	PS	LD	CI	CF	TR	KR
Science (SCI)	PS	PF	PM	LD	CI	CF	TR	KR
Qualification								
Doctoral Degree (DOC)	PF	CI	PM	PS	LD	CF	TR	KR
Master's Degree (MAS)	PS	PM	PF	LD	CI	CF	TR	KR
Other Degree (OTH)	PM	PS	CF	PF	LD	CI	TR	KR
Age								
Young: 20 to < 30 years (YONG)	CF	PM	PS	PF	LD	CI	TR	KR
Middle Age 1: 30 to < 40 years (MID1)	PM	PS	PF	LD	CI	CF	TR	KR
Middle Age 2: 40 to < 50 years (MID2)	PF	PM	CI	PS	LD	CF	TR	KR
Senior 1: 50 to < 60 years (SEN1)	PF	CI	PM	PS	LD	CF	TR	KR
Senior 2: > 60 years (SEN2)	CF	PM	PF	KR	CI	PS	TR	LD
Gender								
MALE (M)	PF	PM	PS	CI	LD	CF	TR	KR
FEMALE (F)	PF	PM	PS	LD	CI	CF	TR	KR
Location								
Tripoli (TRIP)	PF	PS	CI	LD	CF	PM	TR	KR
Gharyan (GHAR)	PF	PM	CI	PS	LD	CF	TR	KR

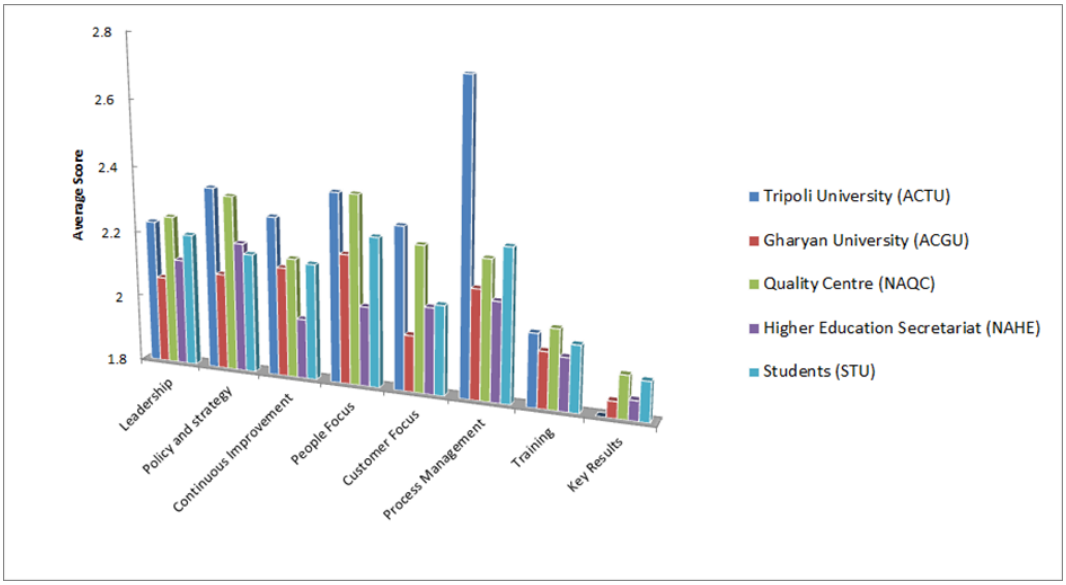

Figure 7.6: A sample plot of GAC scores for various institutional groups

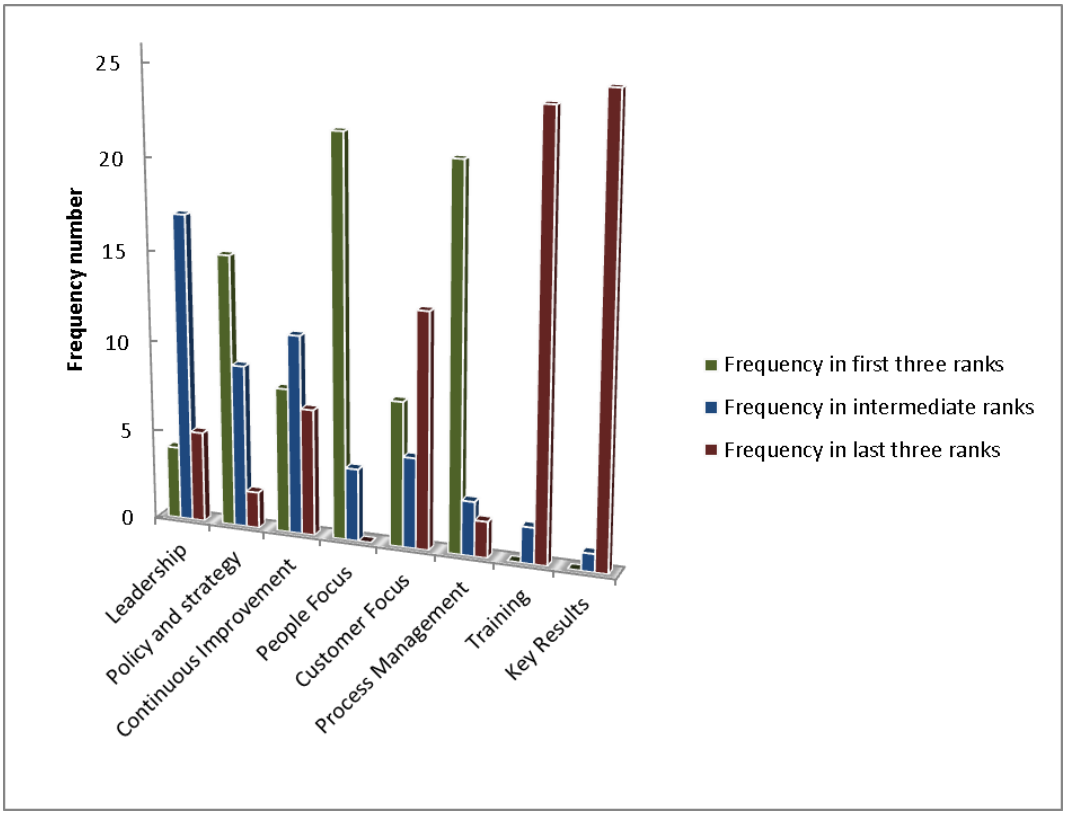

Figure 7.7: Frequency chart prepared from Table 7.14 the for the case of CSFs

Table 7.15: Various groups involved in the study of ranked according to Group Average Scores for CSFs (GACs)

GAC Rank	Leadership	Policy and strategy	Continuous Improvement	People Focus	Customer Focus	Process Management	Training	Key Results
Institution								
1	NAQC	ACTU	ACTU	ACTU	ACTU	ACTU	NAQC	NAQC
2	ACTU	NAQC	NAQC	NAQC	NAQC	STU	ACTU	STU
3	STU	NAHE	STU	STU	STU	NAQC	STU	NAHE
4	NAHE	STU	ACGU	ACGU	NAHE	ACGU	ACGU	ACGU
5	ACGU	ACGU	NAHE	NAHE	ACGU	NAHE	NAHE	ACTU
Faculty								
1	DENT	DENT	DENT	LAW	LAW	EDU	LAW	EDU
2	LAW	ENGG	EDU	DENT	DENT	ECON	EDU	LAW
3	ENGG	ARTS	LAW	EDU	ENGG	LAW	ENGG	SCI
4	ECON	ECON	ECON	ECON	MED	PHAR	MED	MED
5	ARTS	LAW	ENGG	ENGG	ECON	MED	DENT	ENGG
6	SCI	SCI	ARTS	PHAR	ARTS	DENT	SCI	ECON
7	EDU	EDU	SCI	MED	EDU	ENGG	ARTS	PHAR
8	PHAR	PHAR	PHAR	SCI	PHAR	ARTS	PHAR	DENT
9	MED	MED	MED	ARTS	SCI	SCI	ECON	ARTS
Qualification								
1	MAS	MAS	MAS	DOC	OTH	MAS	OTH	DOC
2	OTH	OTH	DOC	MAS	MAS	OTH	DOC	OTH
3	DOC	DOC	OTH	OTH	DOC	DOC	MAS	MAS
Age								
1	MID1	MID1	MID1	SEN1	YONG	YONG	MID1	SEN2
2	YONG	YONG	MID2	MID2	SEN2	MID1	MID2	SEN1
3	MID2	MID2	SEN1	MID1	MID1	MID2	YONG	MID2
4	SEN1	SEN1	YONG	YONG	MID2	SEN1	SEN1	YONG
5	SEN2	SEN2	SEN2	SEN2	SEN1	SEN2	SEN2	MID1
Gender								
1	Female	Female	Female	Male	Female	Male	Female	Female
2	Male	Male	Male	Female	Male	Female	Male	Male
Location								
1	Tripoli	Tripoli	Tripoli	Tripoli	Tripoli	Gharyan	Tripoli	Gharyan
2	Gharyan	Gharyan	Gharyan	Gharyan	Gharyan	Tripoli	Gharyan	Tripoli

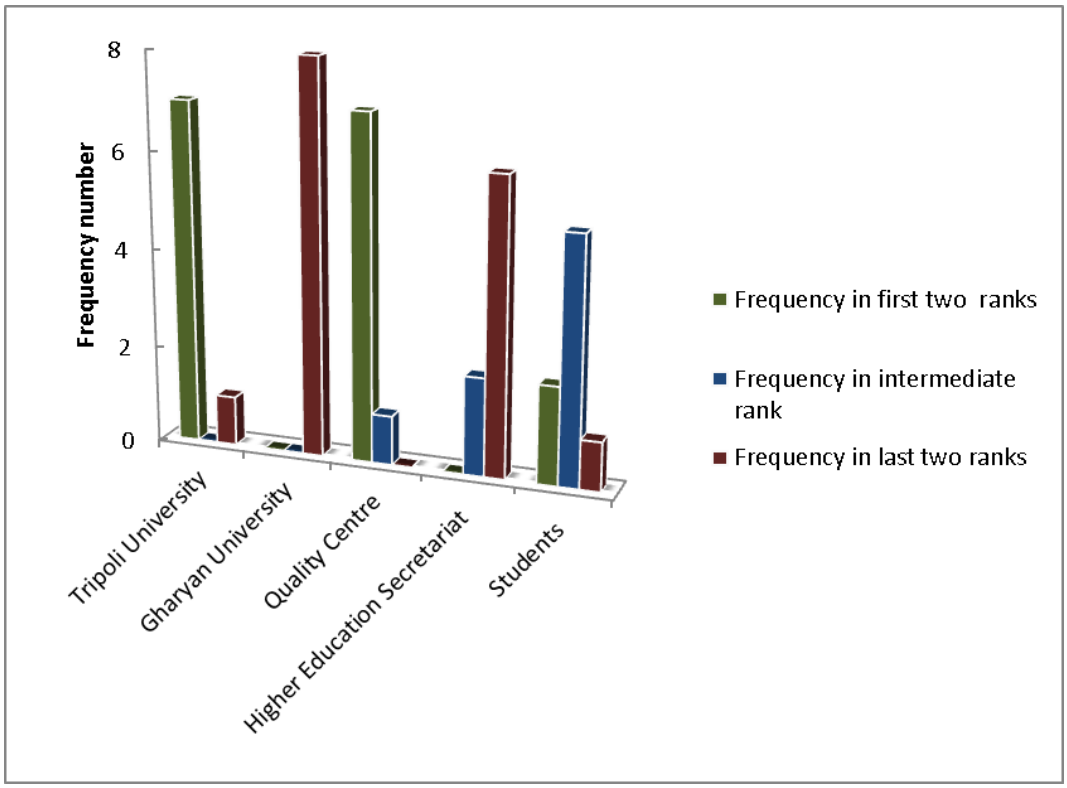

Figure 7.8: Frequency chart prepared from the Table Table 7.15 for the case of Institutional groups.

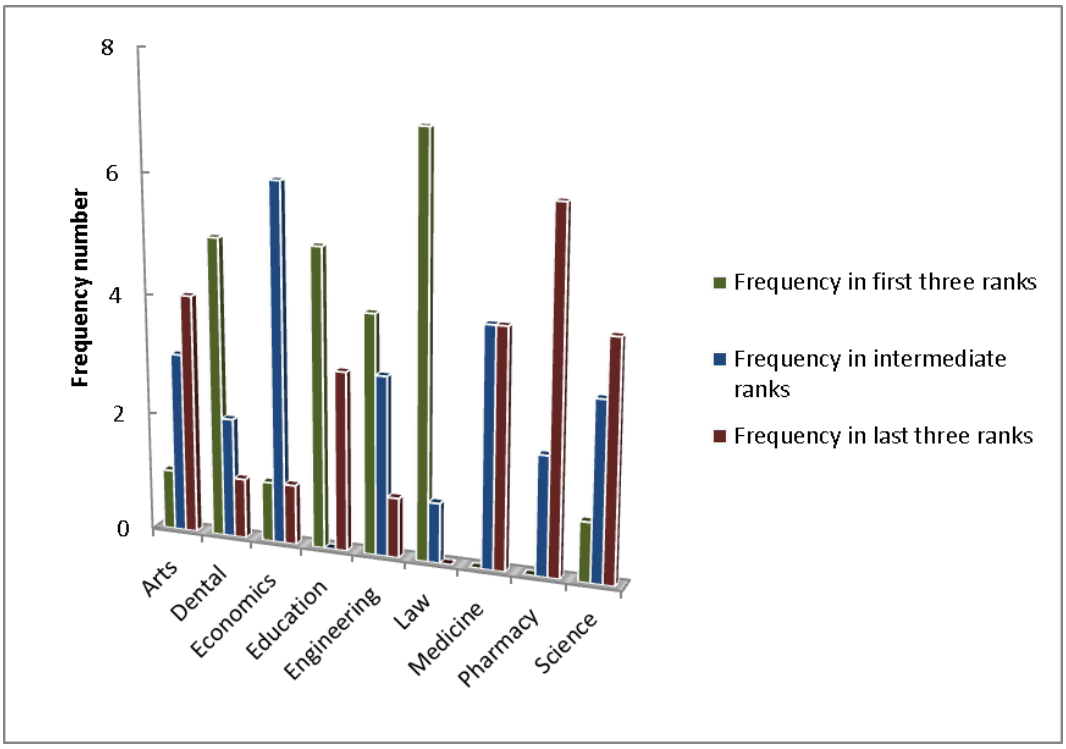

Figure 7.9: Frequency chart prepared from the Table 7.15 for the case of faculty groups

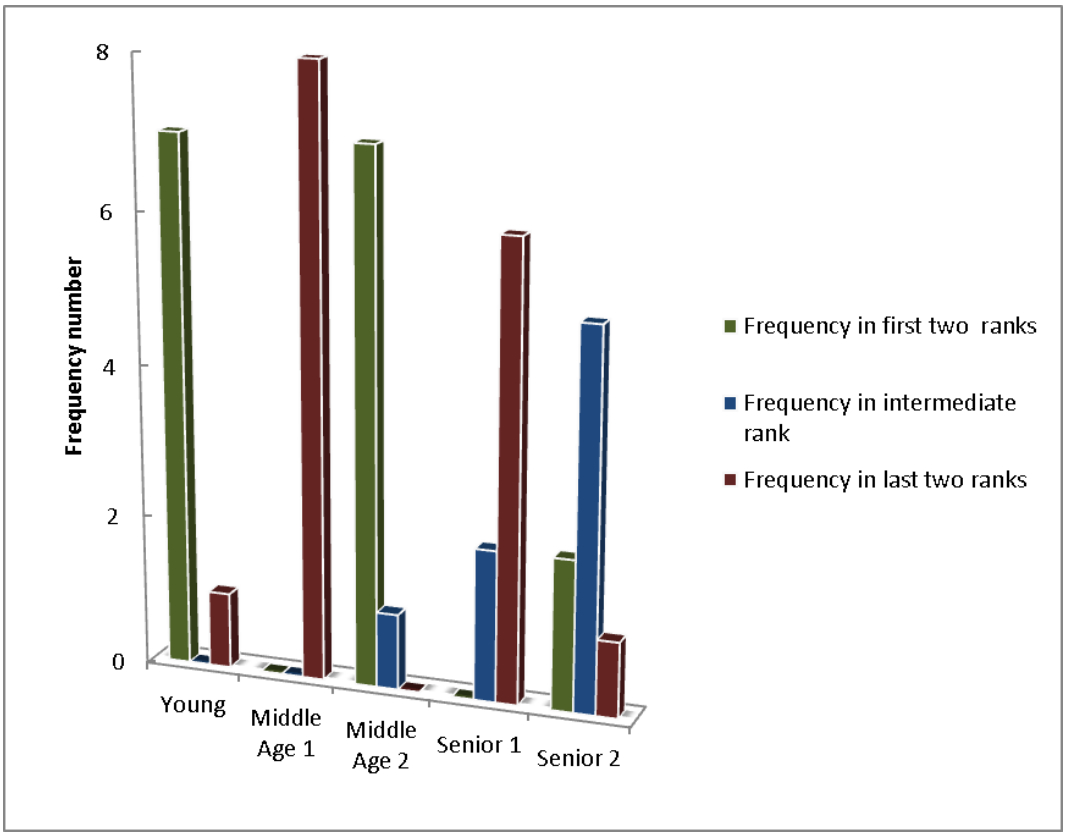

Figure 7.10: Frequency chart prepared from the Table 7.15 for the case of age groups

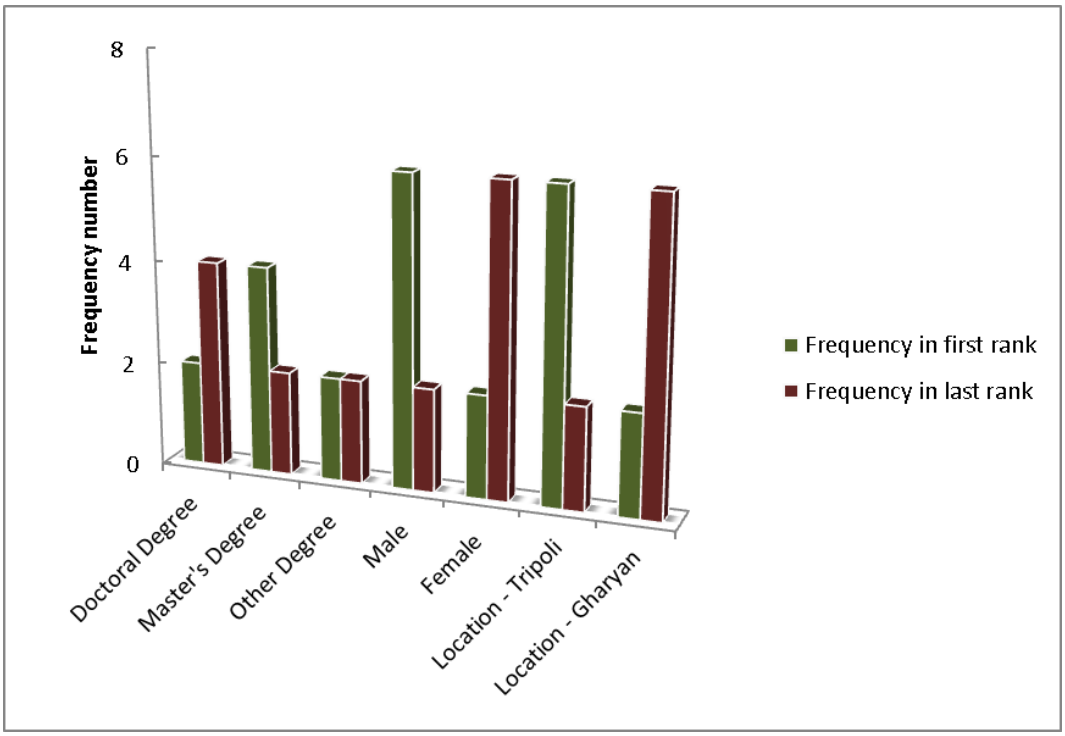

Figure 7.11: Frequency chart prepared from the Table 7.15 for the cases qualification, gender and location groups

7.7.1 Validation Based on Correlation Coefficient Matrices

Correlation coefficient matrices were developed in order to understand interrelationships between GAC scores of various CSFs and groups involved in this study. These results are presented in Table 7.17 to Table 7.23. Guidelines concerning the Interpretation of these results are furnished in Table 7.16

Table 7.16: Guidelines for interpreting correlation matrices across CSFs and groups

Correlation (r) value (Both positive and negative ranges)	Interrelationship Level and symbol used	Interpretation for CSFs	Interpretation for groups
0.75 < r < = 1.00	High (H)	The similarity in GAC scores between two CSFs is high	The similarity in GAC scores between two groups is high
0.50 < r < = 0.75	Medium (M)	The similarity in GAC scores between two CSFs is moderate	The similarity in GAC scores between two groups is moderate
0.25 < r < = 0.50	Low (L)	The similarity in GAC scores between two CSFs is low	The similarity in GAC scores between two groups is low
0.00 < r < = 0.25	Very low (VL)	The similarity in GAC scores between two CSFs is very low	The similarity in GAC scores between two groups is very low

Results presented in Table 7.17 shows that out of 28 entries 4 have a high correlation, 6 have a medium correlation, 12 have low correlation and 6 have a very low correlation. Among these low and very low correlation amounted to 18 which leads to 18/ 28 = 0.64 of the relationships are low or very low. This means for a majority of the cases the score is a little related. Customer focus, process management and key results have shown low relationships for most cases. When compared to the links criteria presented in chapter 4, it can be said that the scores of the respondents were based on little background knowledge on these links and interrelationships.

Among the institution groups, the Gharyan University scores have shown low correlation with Higher Education Secretariat (HES). In addition, the Tripoli University has revealed a medium level correlation with Quality Centre and Higher Education Secretariat. These aspects support the observations on significant differences among the academic and non-academic groups presented in various subsections of chapters 6 and 7 (for example section 6.5.1).

The nine faculty groups listed in Table 6.1 specialise in various fields of study. It is possible that their observations on various issues have been influenced by their specialisation, their evolution in the quality process. For example, it is logical to consider that respondents with the biological background can recognise the importance

of biodiversity on which a question is asked under continuous improvement CSF (item CI10 in Table 6.9). Therefore, when a biologist observes on biodiversity in his work environment he would like to view on that subject more critically than other subject matter specialists. The end result may lead to a low score awarded by the biologist when compared to other specialists.

The fact that the Dental Faculty has scored high KWMR for six out of nine leadership QAPs is considered significant (Table 6.2). This faculty has also scored high under the CSF policy and strategy CSF. For a specific question on which faculties are performing better in education quality three out of four respondents (Interviews 27, 28, and 30) stated that the dental faculty is one of the well performing faculties:

...the faculty of dentistry is performing better in education quality because the seniors and staff members of the faculty are highly competent and more experienced...this faculty is one of the oldest and applies the administrative laws and quality regulations strictly… **(**Faculty member in school of Education at Tripoli University).

This observation reiterates to the findings presented in Box 6.4.1 that the leadership competency and application of quality regulations in appointing the leaders is vital for quality evolution in Libyan higher education sector. Similarly, education faculty's low-level relationships with dental and law faculties can be attributed to the differences observed among them through the statistical tests.

For most CSFs Master's degree holders, have scored high KWMR (Table 6.2; section7.7) and doctorates have mostly scored in the middle or low. Similarly, the middle age groups have scored high for most QAPs while the seniors have scored low. It can be said that in general seniors are also qualified with doctoral degrees. These trends are common among leadership, policy and strategy, continuous improvement; people focus and customer focus (sections 6.4 , 6.5 , 6.6 , 6.7 and 7.1). In general, doctorates and seniors can be considered to have greater insight into education quality matters either due to a greater insight they attained during the education career or due to their longer stay in the academic environment. It is also revealed from the Interview responses that doctoral level staff members and seniors are conservative in their perceptions (Interviews 27 and 28). However, no low correlations are noted among the qualification groups despite the findings earlier pointed to the fact that doctorates generally scored lower. This implies that although the doctorates scored lower,

The pattern of scoring is much similar to Masters and others.

Young and Middle-aged respondents have displayed a low or very low correlation with the seniors has been validated in previous sections for QAP level analysis.

For a majority of QAPs males have scored high and females scored low MWMR. Discussions presented in section 2.3.5 revealed that culturally, Muslim women are more inclined to attend family activities and their perceptions on academic quality advancements are limited. Low enrolment of females in Libyan higher education sector has indicated that gender differences are a reality in the Libyan system (section 2.3).

It can be argued that although the subservient attitude of Libyan women is applicable to non – working females or housewives whereas the respondents of this study are working females and students. However past studies conducted in similar cultural settings have shown that even working females and students of having found difficulty in developing problem-solving approaches on education matters. For example, a study conducted in higher education sector in Africa with comparable cultural settings of Mozambique (a neighbouring country of Libya) revealed that males have a more positive attitude towards education problem-solving approaches than females. The author quoted the following reasoning:

"This finding may be explained by cultural aspects whereby the Mozambican male is often the most dominant member of the family. Traditionally, men are the head of the Mozambican family, the one who works to sustain the family, whereas the Mozambican woman stays at home doing the house work. Although women now have more opportunities to study, work and even reach top positions in their careers, traditional attitudes are nevertheless very strong. Thus, females will seemingly have a positive attitude on preferences to problem-solving approaches when they have developed the ability to problem-solving. Being generally subservient to Mozambican males, this ability does not seem to be cultivated among females" (Dias, 1998)**.**

Gender equity and equality and important concepts to SQM (Osseo-Asare, 2004; Tappeser, 2002). Therefore, it requires for the Libyan system to bring females into quality enhancement framework. Interestingly males and females have shown very high correlation, although earlier analysis pointed to the fact that females generally scored low. This indicates that the scoring trends are similar between males and females.

For most cases those working at Tripoli have scored high when compared to those working at Gharyan (section 7.7). It can be inferred that Tripoli being a capital city of the country, has implemented better higher education quality systems that are perceived by the respondents. This trend also suggests that quality systems are not percolating to regional level higher education institutions in Libya. The location groups have shown high level correlation owing to the differences between those working in the capital city of Tripoli and Gharyan.

7.7.2 Evaluation Based on Sustainability Index

At QAP level, the Sustainability Index (SI) was evaluated and presented along with the non – parametric Kruskal Wallis test Tables. The SI method is distinguished from the Kruskal Wallis discussed presented in section 3.12 ; the non – parametric statistics measures the difference in perceptions of various groups and a comparison of high and low mean ranks. This approach is different from the SI Model approach that evaluates the core issue of TQM sustainability by measuring the quality consciousness of the stakeholders (section3.13).

Past studies have considered that the Sustainability Index should be above 0.5 for TQM sustainability; results presented in various tables of this study revealed that only one of the QAPs reached this level in the Libyan higher education system. The low level of GAC ranks is also reflected in the case of SI results presented in various statistical tables. Therefore, it can be said that the Libyan higher education system is characterised by weak sustainability. In this context, it requires for the quality managers to consider the SI scores of various QAPs and gain further insight into possible rectification measures to improve the status of QAP observations.

Table 7.17: Correlation coefficient matrix between GAC scores of CSFs

CSF / CSF	**Leadership**	**Policy and**	**Continuous**	**People**	**Customer Focus**	**Process Manageme**	**Training**	**Key Resul**
Leadership	1.00 H	0.96 H	0.70 M	0.69 M	0.33 L	0.29 L	0.84 H	-0.40 L
Policy and Strategy		1.00 H	0.67 M	0.68 M	0.33 L	0.36 L	0.82 H	-0.44 L
Continuous Improveme			1.00 H	0.87 H	0.33 L	0.44 L	0.65 M	-0.12 VL
People Focus				1.00 H	0.34 L	0.47 L	0.72 M	-0.04 VL
Customer Focus					1.00 H	0.33 L	0.21 VL	-0.20 VL
Process Manageme						1.00 H	0.28 L	-0.12 VL
Training							1.00 H	-0.05 VL
Key Results								1.00 H

Table 7.18: Correlation coefficient matrix of GAC scores of various Institution groups

Institutions	Tripoli University	Gharyan University	Quality Centre	HE Secretariat	Students
Tripoli University	1.00 H	0.79 H	0.73 M	0.72 M	0.88 H
Gharyan University		1.00 H	0.80 H	0.59 L	0.93 H
Quality Centre			1.00 H	0.84 H	0.84 H
HE Secretariat				1.00 H	0.73 M
Students					1.00 H

Table 7.19: Correlation coefficient matrix of GAC scores of various faculty groups

Faculties	Arts	Dental	Economics	Education	Engineering	Law	Medical	Pharmacy	Science
Arts	1.00 H	0.94 H	0.94 H	0.63 M	0.96 H	0.83 H	0.83 H	0.85 H	0.94 H
Dental		1.00 H	0.84 H	0.49 L	0.93 H	0.79 H	0.68 M	0.70 M	0.83 H
Economics			1.00 H	0.79 M	0.88 H	0.79 H	0.81 H	0.92 H	0.88 H
Education				1.00 H	0.54 M	0.47 L	0.62 M	0.79 H	0.75 H
Engineering					1.00 H	0.90 H	0.89 H	0.80 H	0.86 H
Law						1.00 H	0.85 H	0.69 M	0.67 M
Medical							1.00 H	0.88 H	0.78 H
Pharmacy								1.00 H	0.88 H
Science									1.00 H

Table 7.20: Correlation coefficient matrix of GAC scores of qualification groups

Qualification	Doctorates	Masters	Others
Doctorates	1.00 H	0.82 H	0.74 H
Masters		1.00 H	0.96 H
Others			1.00 H

Table 7.21: Correlation coefficient matrix of GAC scores of age groups

Age	Young	Middle Age 1	Middle Age 2	Senior 1	Senior 2
Young	1.00 H	0.94 H	0.84 H	0.54 M	0.18 VL
Middle Age 1		1.00 H	0.94 H	0.67 M	-0.04 VL
Middle Age 2			1.00 H	0.88 H	0.11 VL
Senior 1				1.00 H	0.30 VL
Senior 2					1.00 H

Table 7.22: Correlation coefficient matrix of GAC scores of gender groups

Gender	Male	Female
Male	1.00 H	0.99 H
Female		1.00 H

Table 7.23: Correlation coefficient matrix of GAC scores of location groups

Location of work	Tripoli	Gharyan
Tripoli	1.00 H	0.76 H
Gharyan		1.00 H

7.8 Summary

Following chapter 6, this chapter further explored results obtained from the study corresponding to remaining four CSFs chosen for the study. This included the second

part of the discussion and findings based on combined quantitative and qualitative analysis. The data gathered on were analysed using statistical tests was presented with reference to 26 study groups under six categories. These quantitative results were compared, verified and validated using qualitative data, explorative literature review presented in Chapter 4, the ground status of the Libyan higher education system presented in Chapter 2 and the gap analysis presented in chapter 5. In addition, summaries were prepared across groups and CSFs based on group average scores and correlation matrices. Trends of high and low observations were discussed and reasoned and causes of differences in perceptions of the groups explored.

In the next chapter, a summary of conclusions and recommendations drawn from chapter 6 and this chapter is presented. Based on these a framework for the synergetic evolution of quality and sustainability in the Libyan higher education system is formulated.

Chapter 8 Summary, Conclusions, and Recommendations

8.1 Introduction

This chapter concludes the thesis linking Sustainable Quality Management (SQM) to the higher education context in Libya. It summarises the existing TQM and sustainability models from the literature, the study objectives and research questions, the critical factors that influenced the problem domain, the methods followed to identify them and the key findings in relation to the study. The chapter concludes with the recommendations drawn from previous chapters and highlights the contribution of this study to new knowledge, the limitations encountered and suggestions for further work.

8.2 Thesis Overview

The motivation for this research arose as a consequence of the researcher's own experience during her academic work at the Gharyan University in Libya where she encountered various issues concerning the sustainability of higher education. There have only been a few quality related studies conducted in Libya that have focused on educational issues at school level (ELhensheri, 2004; Alhmali, 2007). This extends to higher education where a limited number of studies have been conducted into the overall quality and sustainability of the sector (Elhees, 2008; DawTarhoni, 2011).

Initially, the thesis presented a review of Total Quality Management (TQM) literature in education; this revealed that while the adoption of TQM tools and techniques were limited in the higher education sector globally this was more profound in the Libyan higher education sector (section 4.2). Translation of TQM tools and techniques in the education sector is affected by it being less commercially oriented; it is often argued by academics that a customer oriented approach is unsuitable for the higher education sector (sections 7.2.3). In addition, with the advent of global environmental activism, issues of education quality need to be addressed with reference to environmental sustainability. Environmental and ethical issues were rarely reported in the past literature on education quality. The research problem was identified based on these considerations and particularly tailored to meet the requirements of a developing country such as Libya. The focus for the study was therefore to identify drivers and barriers relevant to the enhancement and sustainability of higher education quality in

Libyan institutions. In order to move towards this, goal the study has explored the links and potential synergies between quality and sustainability with reference to higher education. This has led to the development of a sustainable quality management framework (SQM) for the Libyan Higher Education Sector.

The application of Total Quality Management was primarily focused on the manufacturing sector when stringent quality control systems were introduced in the 1950s; these were directed towards quality control and quality assurance systems and were mostly applied at corporate level and based on the work and philosophies of scholars including Deming, Juran, Crosby and Taguchi. The Japanese not only adopted ideas proposed by Deming and Juran, but also developed them further by extending the application of quality improvements from manufacturing processes to administrative procedures (Youssef, 2006). This led to the evolution of quality awards that were internationally recognised (for example the Malcolm Baldrige National Quality Award (MBNQA) and the Deming Prize). The contribution of TQM models proposed by Deming's PDSA and EFQM models to these success stories is also well recognised and a few recent studies conducted in countries such as Greece, Ireland, Spain and the UK have indicated the potential application of these models to the higher education sector; (Section 4.5.2; Alexadris S. S., 2008; Osseo-Asare et al., 2007; Redmond et al., 2008; José Tarí, 2006). The evolution of the quality models also embraced concepts of sustainability and supported a new paradigm that encompasses developmental and organisational processes. Significant among these are the Triple Bottom Line (TBL) model initially proposed by Elkington (1999) and the Five Capital Model developed by the Forum for the Future (FF, 2010). This study has focused on the synergies between quality and sustainability models by analysing and combining the Deming PDSA, EFQM quality models with the TBL and Five Capital sustainability, principles, and applying them to the Libyan Higher Education System.

8.2.1 Study Objectives

Based on the outline of the research problem presented in Section 1.2 , the main aim of this study was

To develop and evaluate a framework for Sustainable quality Management (SQM) in the Libyan Higher Education System.

Specific objectives were formulated as follows:

1. To explore and evaluate how sustainability is addressed in key quality management models (Deming PDSA and EFQM).
2. To identify and examine Critical Success Factors (CSFs) as defined in the Deming PDSA and EFQM literature; based on this Quality Action Programs (QAPs) will be evaluated at sub – criteria level of the CSFs identified.
3. To analyse the outcomes of objective (1) and (2) above towards identifying Critical Success Factors (CSFs) of SQM as main criteria and Quality Action Programs (QAPs) a sub-criterion of SQM.
4. To carry out two university-based case studies for examining the validity of these CSFs and QAPs.
5. To develop a framework for SQM in Libyan HE sectors and evaluate this framework through semi – structured interviews at the case study locations.

8.2.2 Research Questions

An account of how the research questions were formulated and addressed for this study is presented in the following section.

Research Question 1: What are the Critical Success Factors (CSFs), as main criteria, and Quality Action Programs (QAPs), as sub – criteria, for achieving Sustainable Quality Management (SQM) in Higher Education?

Firstly, this question was addressed by analysing key literature that focused on various Critical Success Factors (CSFs) of TQM and sustainable development. Chapter 5; Appendices I, J and K, provided a comparison of the CSFs considered for analysis. Eight CSFs were identified for the present study; these were Leadership, Policy and Strategy, Continuous Improvement, People Focus, Customer Focus, Process Management, Training and Key Results. A detailed analysis for the links between quality and sustainability models and related CSFs was then conducted to identify Quality Action Programs (QAPs). Six types of links were identified among the QAPs

(chapter 5; Appendices I, J and K); this provided a framework for the 72 Quality Action Programs (QAPs) investigated in the study.

Research Question 2: How are sustainability issues linked to Deming PDSA and EFQM models?

A detailed literature review was conducted of these models (sections 4.3 and 4.4); the literature studied Deming's 12 quality principles, and follow – up research studies conducted on these principles, their application in different parts of the world with specific reference to the higher education sector (Redmond et al., 2008). Design criteria and sub–criteria of the models were studied and links identified based on the conclusions drawn from past studies. In addition, these relationships were analysed in the cultural context of Arab higher education, with particular reference to Libya. Finally, the nine main design criteria and associated sub – criteria of the EFQM model were studied and the links of these with Deming's PDSA were explored and presented in chapter 5.

Research Question 3: How are the CSFs and QAPs implemented in Libyan Higher Education Institutions and what types of gaps are visible at various levels of the Libyan HE system?

Answers to this question were attained through the gap analysis presented in Chapter 5; five types of gaps (gap between customer expectation and management's perception of customer expectation; gap during translation of perceptions into service quality; gap between service quality and service delivery; gap between service delivery and external communications; and gap between customer perception of the service and final service received). These gaps were normally encountered in TQM implementation and related to the Higher Education context. This analysis was primarily supported by semi – structured interviews conducted with Libyan higher education experts in the first and second phase.

Research Question 4: What are the perceptions of Libyan internal stakeholders within HE about the present level of implementation of the SQM QAPs identified? Are there other issues to be considered and implemented towards enhancing and sustaining quality?

Research methods adopted to address this question included a questionnaire survey conducted with 678 Higher Education respondents comprising of 26 groups under six

categories; the collation of the questionnaire survey data results and the statistical analysis of data results was undertaken using SPSS software. This was complemented by the, collation and analysis of 31 semi - structured interviews conducted with Libyan higher education experts.

Research Question 5: What elements are included in a (SQM) framework model that can contribute to enhancing and sustaining quality in the Libyan Higher Education system?

A Sustainable Quality Management framework for enhancing and sustaining quality in Libyan higher educational institutions is suggested through the findings of the study in chapters 6 and 7. These are summarised in conclusions and the recommendations presented in sections 8.3 and 8.4

8.2.3 Research Methods

This study followed a sequential exploratory design that involved a combination of quantitative and qualitative approaches. Quantitative data collection was primarily acquired through a questionnaire survey of over six hundred respondents (section 3.9 3.9). Qualitative data collection included 31 semi – structured interviews conducted with Libyan experts in the field of higher education. The questionnaire data was edited for computer compatibility through the SPSS software package, classified, compiled and tested for validity and reliability. Responses were then classified into 26 academic and non – academic groups under six categories (section 3.10). Statistical analysis applied to these groups included non–parametric Kruskal Wallis and Mann Whitney tests to provide (a) a comparison of high and low mean ranks across groups and categories and (b) statistically significant differences in the implementation of various Quality Action Programmes (QAPs) in the Libyan higher education system. Based on this analysis reasons for the differences among the groups were inferred and mitigation measures for addressing low levels of implementation of QAPs were outlined. Subsequently these Group Averages for QAPs (GAQs) and participant Groups for CSFs (GACs) were computed. In addition, the GAQ and GAC scores were sequentially ranked and arranged by CSF (section 7.7). This lead to the positioning of CSFs and groups as top, intermediate or bottom ranked performers. Further to the

statistical analysis, an analytical procedure was also followed based on quality awareness of the academic and non – academic groups that lead to the estimation of the Sustainability Index for each QAP. A mixed methods analysis of quantitative and qualitative data was undertaken through data and methodological triangulation (Creswell, 2013; sections 3.8 and 6.1). Conclusions and recommendations were drawn from the analysis and roadmaps for implementing SQM QAPs in the Libyan higher education system are presented.

8.3 Conclusions

Based on the findings presented in the previous chapters of this dissertation, the following conclusions are drawn:

1. The term "Sustainable Quality Management (SQM)" depicts a future-oriented framework that integrates TQM and sustainability models. The need for developing this framework through this study primarily arose due to: (a) the impact of TQM sustainability on organisational performance and (b) inadequate representation of environmental and ethical factors in the existing TQM models (Figure 4.1 and Figure 4.2). To repeat John Elkington's quote which stresses the need for research in this area:

   > *On the sustainability side, we often forget the intense evolutionary curve that the quality movement raced up in the 1980s as new standards and expectations triggered immense changes in business. So the fact that TQM does not yet fully embrace sustainability today does not rule out a powerful convergence in the future* (Section1.1; Elkington, 2011).

2. Achieving the sustainable quality goals of higher education institutions critically depends on many and diverse factors (Osseo-Asare et al., 2007). The importance of these Critical Success Factors (CSFs) is often used as a measure of performance evaluation (section 4.10; Kanji et al., 1999). This study focused on these CSFs with a primary objective of exploring them in the context of synergies between quality and sustainability. In general a low level of implementation of CSFs and QAPs was observed in the institutions studied due to a lack of quality awareness, inadequate

knowledge of quality management tools and techniques, lack of quality training, inadequate development and evaluation of SQM policies and strategies, and a lack of measurement of key results (section 7.7 ; Figure 7.6; Table 7.13).

3. Libyan higher education leadership has been observed by respondents to have low commitment and involvement on issues relating to purpose and direction of the organisation, the involvement of staff, timely decisions and continuous improvement (section 6.4.1). The fact that academic leadership is nominated and not appointed based on pre – defined selection criteria has often resulted in incompetent staff members occupying top management positions. At times, large numbers of recruitment are made in a short period of time and inadequate selection criteria have hampered the selection process. Although the leaders are aware of some of the leadership QAPs under the TQM framework, inaccurate personal references failed to indicate the low level of awareness on sustainability QAPs (Box 6.4.2). Interview responses also suggested that the leaders were unable to implement the QAPs of which they were aware, due to the prevailing centralised decision-making system. In this context, recent transitions towards the decentralisation of education (section 2.6 will enable a move towards the participation of all stakeholders in the quality process that is favoured by the TQM sustainability models. Little evidence was found in the literature to prove the argument of the interviewed Libyan leaders that there exists an inverse relationship between the level of student enrolment and quality of education (Box 6.4.1).

4. A majority of QAPs under the Leadership and Policy and Strategy CSFs were perceived by the study groups with statistically significant differences (Table 6.2 to Table 6.6 B, section 6.5.1). Mixed methods analysis revealed that some of these differences are due to (a) Lack of clarity of Libyan education experts on leadership QAPs when compared to standard design criteria advocated by the PDSA, EFQM and sustainability models (Box 6.4.1); (b) differences in viewpoints of respondents about involving only faculty members, or all internal stakeholders in the planning process of academic institutions (Table 6.8); (c)

different opinions on the use of self - assessment or external evaluation on performance evaluation of staff (Table 6.8; Box 7.5.1); (d) potential confusion among the respondents in observing drivers as barriers; examples of this include dilemmas over the promotion of local culture or the promotion of different cultures (TQM and sustainability models advocate the promotion of local culture) and perceiving tribal culture that is a local culture in Libya, as a hindrance to quality improvement. While some of these differences such as (b) and (c) above reveal the individual preferences of the respondents others are predominantly due to lack of knowledge on fundamental quality principles and inadequate training about these.

5. For decades the Libyan higher education system has lagged behind in implementing QAPs of Continuous Improvement, specifically on the following aspects: (a) collection of staff and student feedback and processing systems that were not developed due to lack of knowledge and expertise (sections 6.6.1 and7.2.1 (b) Lack of a centralised coordination system in curriculum improvement (section 6.6.4 , Box 6.6.2); (c) lack of awareness of statistical quality control systems; (d) education that largely relied on memory and not on creativity and innovation due to lack of functional heterogeneity among staff, limited empowerment of staff and a hierarchical organisational culture. Argument centred on the perceived skills required by students in the labour market often hampered creativity and innovation (section 6.6.3 and Box 6.6.1). Lack of books and references and the inability of staff and students to attend specialized courses and conferences also hampered continuous improvement. Some of the barriers identified are the absence of teamwork, reliance on an inspection system for quality, preference for Arabic as the medium of instruction, resistance to change for fear of revealing defects, lack of funds and limited authority for quality offices, communication problems between local and head office, and an absence of reward systems and benchmarking.

6. A central feature of this study and SQM is the inclusion of several QAPs as sub – criteria on the environment, natural resources and biodiversity. These were developed based on existing TQM and sustainability models. Inclusion of Triple

Bottom Line (TBL) in the financial process (section 6.5.3), TBL based performance evaluation (section 7.5.1), efficient use of natural resources (section 6.5.3), neutralising harmful wastes (section 6.6.5) enhancing biodiversity (section 6.6.6 are QAPs that focused on university campus environment. Results revealed that although Libyan HE leadership is aware of the significance of these QAPs, either due to limited funds or a lack well-defined guidelines, little action is observed at the university campuses on their implementation (section 6.4.3). The two universities studied are yet to develop policy documents on these QAPs, while such documents have already been developed in UK universities, usually with a central agency, for example, Estates being responsible for coordinating the activities, often as part of university wide initiatives as mentioned above.

7. Several social and ethical problems hamper quality and its sustainability in the higher education institutions of Libya. This research has revealed that (a) a lack of transparency due to deficient criteria, and lack of accountability of staff members has often resulted in administrative corruption and dishonest staff (sections 6.5.3 and 6.7.1); (b) absence of policies to include internal and external stakeholders in the education process has led to inadequate participation and (c) limited involvement of the higher education institutions with their local communities.

8. Among the survey institutions Tripoli University and the Quality Centre have shown better SQM performance and the Gharyan University has been the lowest overall. In general, increased awareness of quality tools and techniques at Tripoli University is observed due to its proximity to the Quality Centre, which has well-qualified staff members and long term high academic standing.

9. This study identified the need for linking the TBL to various aspects of the education system: (a) key financial results with economic sustainability; (b) focus on social capital and sustainability and (c) ecological results with environmental sustainability. Past studies have shown that even in the academic institutions of developing countries the financial outcomes and education output are not measured or compared with equivalent organisations as advocated by the TQM models (Section 4.8). This is more perceptible in the case of Libya, where a free

education system is predominant (Sections 2.4 , 2.5 and 2.5). Universities are often funded by local government and or international donors that limit review of financial outcomes to the number of students educated. Lower scores of the two universities studied on these questions indicate that measuring financial outcome and education output are monitored to only a limited degree. However, there is a growing pressure on the central educational agencies of Libya to set standards and to enhance focus on institutional and accounting outcomes in the context of the recent drive on the privatisation of universities.

8.4 Recommendations

A number of recommendations can be made in response to the findings summarised above:

1. Building a culture of quality: There is a need for a quality revolution in the Libyan higher education system. The first step in this direction is to build a culture of quality among all stakeholders and the second is to provide adequate quality training for the leadership and the members of the senior management (Conclusion 2 above). Because the leaders of Libyan higher education system are usually themselves not quality trained; new leaders should have core quality and SQM training (Conclusion 3).
2. Tackling weak environmental QAPs: further studies are required to understand the reasons for under – performing QAPs in each Libyan university with respect to sustainability (Conclusion 6). Some of the issues that require urgent attention are: (a) development of "sustainability in campus" policy documents; (b) development and integration of systems for including TBL into financial processes; (c) steps towards regular community activities and inclusion of the social, economic and environmental oriented community activities mentioned in conclusion 9; (d) Biodiversity and Conservation through increasing the number and variety of biological species in the university campuses (Conclusion 6); (e) Procedures introduced to ensure that laboratory based experimental wastes

are safely disposed of. A first step towards this is to revive the General Authority for Environment and develop its interface with universities (Conclusion 6).

3. Improving social and ethical QAPs: As a first step, clear policy guidelines need to address the issues presented in conclusion 7; including transparency, development of stakeholder approaches, social justice and involvement with local communities.

4. Sharing experiences and mentoring: faculties in the middle and low performance positions can gain insight from the experiences of top ranking faculties of the Libyan system e.g. quality experts in Dentistry and Law at Tripoli could mentor other, less well performing, faculties. Lack of funding was quoted as another reason that hampered quality initiatives and, therefore, it is necessary to provide adequate funds for financially weaker faculties. A robust mechanism for identifying and ensuring funding for quality departments of all universities needs to be developed.

5. Developing feedback collection and processing systems: This should be integrated into the university systems on a regular basis. A first step towards this is providing training to the quality department staff with quality tools such as statistical quality controls, quality circles and benchmarking with specific attention being paid to the introduction of environmental quality measures.

6. Quality orientation to regional universities: It is evident that institutions located in more remote areas are less exposed to professional quality experiences and expertise; through national level quality conferences and workshops this lacuna can be alleviated and will contribute to a concerted effort to raise quality awareness among the regional universities.

7. Continuous Improvement: At the highest level of Libyan higher education decisions need to be taken that can benefit and motivate both staff and students (section 6.6.4 ; conclusion 5). Rapidly advancing technologies such as e-learning systems, LCD projectors and digital laboratory equipment should be continuously upgraded. Quality assurance models

similar to QAHEL in Lebanon and QAAC in Egypt can also be considered for adoption. The barriers to SQM presented in Conclusion 5 needs to be studied examined at each university and across Libyan higher education as a whole and remedial measures need to be taken on these issues.

8. Making decentralization a reality: The centralized higher education that prevailed in the past is seen as one of the major reasons for poor quality and weak sustainability. This can be alleviated through further concerted efforts towards involvement and participation of everyone in the quality processes.

9. Improving key results: The QAPs concerned with results on all three dimensions of sustainable quality (TBL) require an urgent focus, and appropriate tools and techniques should be developed (conclusion 9).

10. Evolving self – assessment systems: Findings from this study indicate a preference for self –assessment of SQM systems in the higher education context. The templates of the EFQM model tested in some European universities are a promising alternative and can be considered for adoption in the Libyan universities (conclusion 4).

8.5 Study Implications

The implications of this study for quality management in general and for the Libyan Higher Education system are considered below:

- The quality culture within the Libyan Higher Education System will need to change at Government (Ministry), and University (management) levels and within the institutions (staff and students).
- The implementation of SQM in Libya will require a more 'modern' approach to strategic management and HE leadership (policy and planning Critical Success Factors).
- Responsibility for the implementation of quality management needs to be devolved downwards and away from the centre
- The environmental impact of Higher Education needs to be reduced e.g. energy, water use, carbon footprint. Enhanced environmental performance will have beneficial economic outcomes.

- Where universities have a better quality culture (continuous improvement), they might become more attractive to students and staff in a more competitive HE environment – bringing further economic and social benefits.
- The promotion and measurement of financial outcome and education output might enhance economic sustainability.
- The implementation of SQM into the Libyan Higher Education System may be helped by enhancing social and ethical performance through the adoption of more transparent efficiency criteria and processes.

The proposed SQM framework can help Libyan leaders, senior management and practitioners to understand that before implementing quality management improvements, they should make sure that they actually have the knowledge, belief, values, behaviour and resources necessary to the start the improvement. The study showed that the sustainable quality management model is a comparatively new approach and practice in Libyan higher education institutions and its implementation is hindered by a hierarchical organizational culture with a limited empowerment of staff, and functional heterogeneity among them. The implementation of SQM also requires a re-evaluation of the entire organization and management roles and the acquisition of new skills and knowledge across top management, academic staff, and employees at all higher education levels.

The study could enhance new strategies aimed at restructuring HE organization, continued development of learning, audit quality management process and the attitudes and expertise of leadership to quality management in Libyan Higher Education institutions. In consequence, it could help Libyan HE institutions, bridge the gap between theory and practice at all levels of the higher education system by encouraging their institutions to move from traditional quality procedures to SQM.

8.6 Research Contribution

This study identified and analysed eight Critical Success Factors as main criteria and 72 Quality Action Programs as sub – criteria with reference to enhancing and sustaining quality in the Libyan higher education system. In the Libyan context, this analysis is the first of its kind that has the potential to contribute to the further development of SQM in

the system. This study accomplished insight into the mechanisms and links at the sub – criteria level Quality Action Programs depicted by Deming PDSA, EFQM, and sustainable development models. The outcome of this research provides new insights into the current state of Libyan Higher Education Sector; it has also added to the existing literature on TQM and Sustainability in in developing countries.

The synergies between TQM and Sustainability explored in this study are considered as an original contribution to enhancing and sustaining quality in universities and higher education institutions. This study developed distinct insights into:

- quality evaluation based on Sustainability Index - links to Green Campus agenda,
- a comparison of social justice and transparency in the two universities studied,
- utilisation and conservation of natural resources at higher educational institutions,
- application of TBL in financial process of educational institutions,
- application of creativity and innovation with reference to sustaining quality in higher education,
- influence of Libyan local cultural issues on higher education quality,
- a comparison of customer versus stakeholder approaches with reference,
- an analysis of Key Results orientation to higher education, biodiversity in the campuses
- And the need for self – assessment systems at the Libyan universities.

The framework elements developed and proposed through the conclusions and recommendations of this study can be utilised by Libyan Higher Education leaders towards understanding quality and sustainability issues involved in the system before implementing them. However, last but not the least, this study has contributed to the personal development of the researcher and enabled her to fulfil her visions on higher education quality systems of Libya.

8.7 Study Limitations

This study is explorative in nature and it is visible from the existing literature that TQM and sustainable development synergies are still evolving. Therefore, often the researcher had to encounter literature that is either inadequate in content or inconclusive. For example, Redmond's (Redmond et al., 2008) attempt to apply only a few of Deming's 12 principles in the higher education system is yet to be reported.

One of the key limiting factors of this study was the constraint on resources required for conducting the study at the country level. The researcher had limited funds at her disposal for conducting this study; considerable attention was however laid on the research design, sampling and statistical analysis procedures adopted so that the sample collected represents applications in the Libyan national perspective. However, in its present form, the study was confined to two universities and two important non – academic institutions.

Another limitation of the study, and an important finding was the lack of awareness among participants about potential quality and sustainability synergies. This was further complicated by the need to move between Arabic and English with the researcher having to translate, clarify and explain many complex issues and concepts that were key to this study.

However, this thesis has discussed the relationship between quality and sustainability in Libya. It has not taken account of the considerable social and political upheaval that has both influenced Higher Education, and the country as a whole, and specifically the ability of the researcher to undertake her study in these conditions. It is not proposed to analyse the influence of the political situation on the project because it is to be hoped that these conditions will not be experienced by other researchers who are attempting to link quality and sustainability factors. It has however been reflected on in the methodology, particularly for primary data collection.

8.8 Suggestions for Further Studies

The findings of the study point towards further research in two ways. Firstly, the quality and sustainability synergies can be explored beyond the design criteria and sub–criteria chosen for the study. Secondly, the findings presented in Chapter 5 suggest that there are many gaps in the quality evolution of the Libyan higher education system. This

study can be extended to other sectors, particularly those which have direct links with quality and sustainability domains e.g. manufacturing, health and tourism sectors.

Leadership issues discussed in the Libyan context need to be critically examined in a separate study and a detailed framework for selection and performance evaluation needs to be evolved with reference to the quality and sustainability. In addition to this some of the promising areas identified in the study that would benefit from further research are: (a) effects of decentralisation of higher educational institutions; (b) Green Campus criteria for higher education in the Libyan context; (c) Social Justice and transparency in the university system; (d) Natural resources management in higher education; (d) inspection and reward systems of Libyan higher education; (e) feedback processing in Libyan higher education; (f) Quality training requirements in Libyan higher education; (g) Building a culture of quality and sustainability at the higher education institutions and (h) Implementing TBL in the financial process of higher education institutions.

There is also scope for conducting a major study on the influence of language and culture on Libyan higher education quality.

8.9 Summary

This last Chapter of the dissertation began with a summary of the study; this was followed by the overall study conclusions and recommendations for Sustainable Quality Management in Libyan Higher Education. The research contribution, study limitations, research implications and suggestions for further research were then discussed and a final objective identified; namely that the findings of this study will help to steer Libya towards the attainment of total and sustainable quality standards and practices in her higher education system.

List of Author's Publications

Paper 1: Sustainable Quality Management in Libyan Higher Education: A study in process innovation

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Sustainable Quality Management in Libyan Higher Education: A study in process innovation

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Abstract

An increasing interest in the implementation of quality management programs in higher education has been observed over the past decade, particularly among developing nations. Previous studies have shown that universities find it difficult to sustain quality programs but global initiatives by UNESCO and UNDP have encouraged the adoption of sustainability in every facet of university systems including education quality. An extensive review of sustainability and quality related literature suggests that a SQM model can be developed for higher education through the integration of sustainability and quality models. This implies that apart from economic considerations, environmental and social dimensions should be included in quality management. In order to move towards this goal, the paper explores links between Sustainability principles (a combination of the Triple Bottom Line and Forum for the Future's Five Capital model) and two quality management approaches – (Deming's Plan Do Study Act (PDSA) and the European Foundation for Quality Management (EFQM)). The paper builds on these literatures through the presentation of data derived from a study of over six hundred respondents engaged with Higher Education in Libya and reports on the synthesis of this literature and data to present a sustainable quality management (SQM) framework consisting of eight core Critical Success Factors (CSF's). The paper will focus on one of these CSF's; the role of leadership

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Keywords: quality management; sustainability; higher education; quality models

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Paper 2: Integrating the Total Quality Management and Sustainability in the Libyan Higher Education System by Evaluating the Policy and Strategy

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Abstract—**There has been an increasing interest in the implementation of the Total Quality Management (TQM) in the Higher Education (HE) sector over the past decade. However, TQM sustainability remains a significant challenge. This paper draws upon a case study of Libyan HE to explore how models of sustainability and TQM can be integrated into one of Sustainable Quality Management (SQM).**

The paper introduces the literature relating to TQM, Deming's' Plan-Do-Study-Act, and the European Foundation for Quality Management models and sustainability models (Triple Bottom Line and Five Capitals Model) and considers how these can enhance the HE sector. It presents the qualitative and quantitative data and analysis from over 30 interviews and 678 questionnaires with internal HE stakeholders in Libya (University staff and students, administrators and senior management, and representatives of the National Quality Centre). The data collection focused on the integration of TQM and sustainability criteria to generate a framework for SQM. This consisted of eight Critical Success Factors (CSFs) and 72 sub-criteria derived from these models. The overall findings are summarized and detailed consideration is given to one CSF relating to policy and strategy, which is of particular significance for Libyan HE. A final section of the paper presents the key findings relating to this CSF and discusses the relevance of SQM for HE in Libya and more widely.

Index Terms—**Sustainable Quality Management, Policy and Strategy, Higher Education in Libya, Triple Bottom Line, and Five Capitals Model.**

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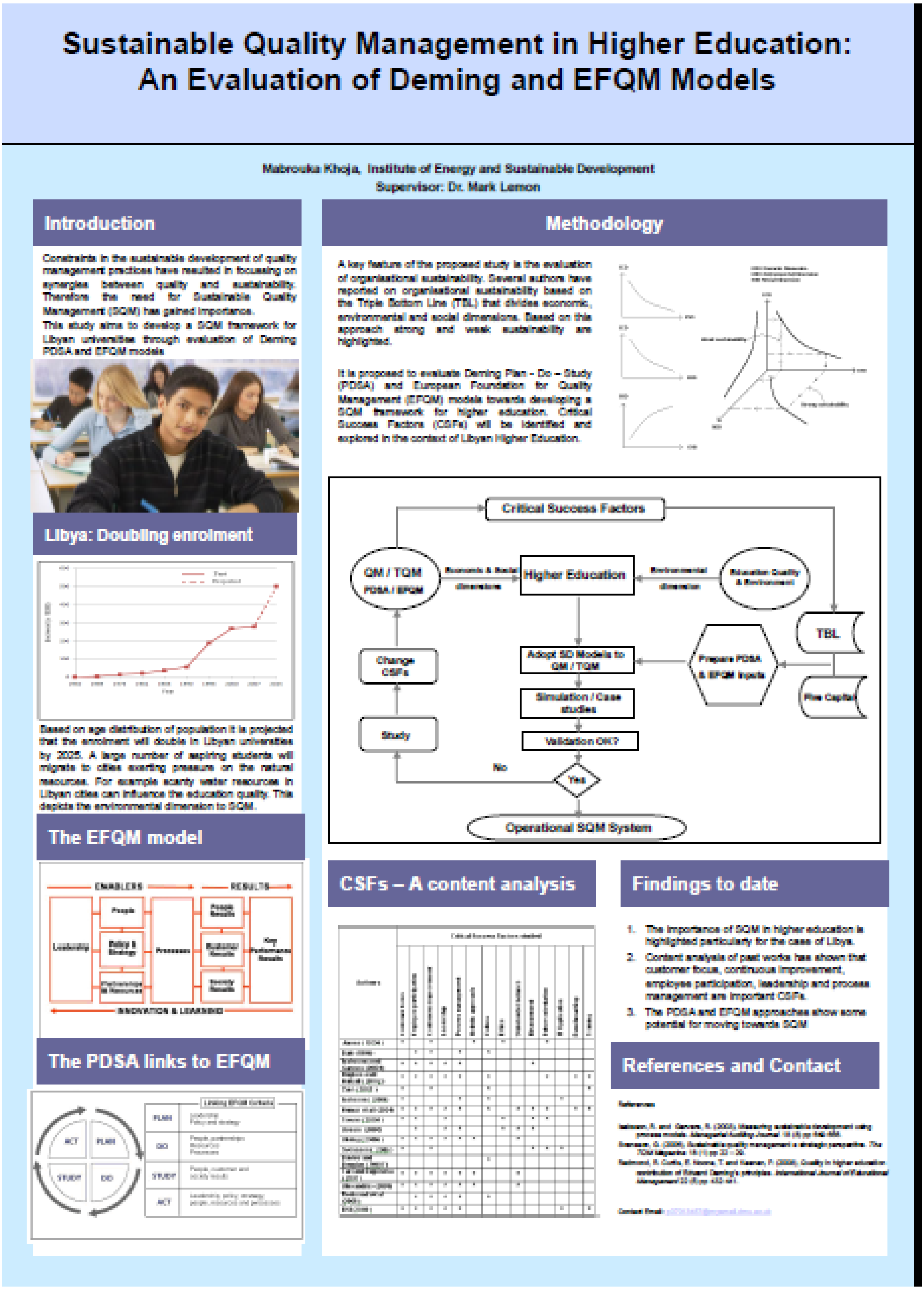

Sustainable Quality Management in Higher Education: An Evaluation of Deming and EFQM Models
Mabrouka Khoja, Institute of Energy and Sustainable Development
Supervisor: Dr. Mark Lemon
Introduction
Constraints in the sustainable development of quality management practices have resulted in focusing on synergies between quality and sustainability. Therefore the need for Sustainable Quality Management (SQM) has gained importance.
This study aims to develop a SQM framework for Libyan universities through evaluation of Deming PDSA and EFQM models
Libya: Doubling enrolment
Based on age distribution of population it is projected that the enrolment will double in Libyan universities by 2025. A large number of aspiring students will migrate to cities exerting pressure on the natural resources. For example scarcity water resources in Libyan cities can influence the education quality. This depicts the environmental dimension to SQM.
The EFQM model
ENABLERS
RESULTS
Leadership
People
Policy & Strategy
Partnerships & Resources
Processes
People Results
Customer Results
Society Results
Key Performance Results
INNOVATION & LEARNING
The PDSA links to EFQM
ACT
PLAN
STUDY
DO
Methodology
A key feature of the proposed study is the evaluation of organisational sustainability. Several authors have reported on organisational sustainability based on the Triple Bottom Line (TBL) that divides economic, environmental and social dimensions. Based on this approach strong and weak sustainability are highlighted.
It is proposed to evaluate Deming Plan - Do – Study (PDSA) and European Foundation for Quality Management (EFQM) models towards developing a SQM framework for higher education. Critical Success Factors (CSFs) will be identified and explored in the context of Libyan Higher Education.
Critical Success Factors
QM / TQM
PDSA / EFQM
Economic & Social dimensions
Higher Education
Environmental dimension
Education Quality & Environment
TBL
Five Capital
Change CSFs
Adopt SD Models to QM / TQM
Prepare PDSA & EFQM inputs
Simulation / Case studies
Study
Validation OK?
No
Yes
Operational SQM System
CSFs – A content analysis
Findings to date
1. The importance of SQM in higher education is highlighted particularly for the case of Libya.
2. Content analysis of past works has shown that customer focus, continuous improvement, employee participation, leadership and process management are important CSFs.
3. The PDSA and EFQM approaches show some potential for moving towards SQM
References and Contact
References

References

AAKER, D. A. 2011. Marketing Research, Wiley.

AARU 2007. , the Association of Arab Universities .

ABUBAKER, A. 2008. Influence of Core Cultural Values on The Communication Behaviour of Staff In Libyan Organisation. Unpublished manuscript.

AGNAIA, A. A. 1996. Assessment of management training needs and selection for training: the case of Libyan companies. International Journal of Manpower, 17, pp.31-51.

AGRAWAL, S., SINGH, R. K., MURTAZA, Q., GUGLER, P. & SINGH, R. 2016. Triple Bottom Line Performance Evaluation of Reverse Logistics. Competitiveness Review: An International Business Journal.

AHIRE, S. L., GOLHAR, D. Y. & WALLER, M. A. 1996. Development and Validation of TQM Implementation Constructs. Decision Sciences, 27, pp.23–56.

AHMAD, S. & SCHROEDER, R. G. 2002. The importance of recruitment and selection process for sustainability of total quality management. International Journal of Quality & Reliability Management, 19, pp.540-550.

AHMED, R. & ALI, S. I. 2016. Implementing TQM practices in Pakistani higher education institutions. Pakistan Journal of Engineering, Technology & Science.

AL-SAADI, R. 2010. Effectiveness of technology transfer in the search for sustainable development: The case of Qatar.

AL-THANI, S. J., ABDELMONEIM, A., DAOUD, K., CHERIF, A. & MOUKARZEL, D. 2014. Developing, implementing and improving learning outcomes assessment in Qatar's public higher education. Near and Middle Eastern Journal of Research in Education.

ALEXADRIS. S. 2008. Implementation Of Efqm Model In A Greek . Engineering Higher Education Institute: A Framework And A Case Study
International Journal for Quality research, 1, pp. 43 – 50.

ALHMALI, R. 2007. Student attitudes in the context of the curriculum in Libyan education in middle and high schools. University of Glasgow.

ÁLVAREZ, M. E. P., BÁRCENA, M. M. & GONZÁLEZ, F. A. 2016. A Review of Sustainable Machining Engineering: Optimization Process Through Triple Bottom Line. Journal of Manufacturing Science and Engineering, 138, pp.100-801.

ALY, N. & AKPOVI, J. 2001. Total Quality Management System in California Public Higher Education. Quality Assurance in Education, 9, pp.127-131.

AMBAREK, M. S. 2010. The need for Quality Management Systems in Libyan universities. The Libyan journal of medicine, 5.

ANTONY, J. 2004. Some Pros and Cons of Six Sigma: An academic Perspective. The TQM Magazine, 16, pp.303-306.

ANTONY, J. (2008). Avalibale"https//Pros and consof Six Sigma: an academic perspefile:///G:PhD%20%209%Nov%2013/Papers.

ANON. 2012. Quality management principles, available at: http://www.iso.org/iso/pub100080.pdf [accessed:01/12/2016].

ANON. 2016a. Safeguarding standards and improving the quality of UK higher education, available at :http://www.qaa.ac.uk/about-us [accessed:11/11/2016].
ANON. 2016b. The UK Quality Code for Higher Education, avaliable at: http://www.qaa.ac.uk/assuring-standards-and-quality/the-quality-code [accessed: 30/12/2016].
ASTIN, A. W. (1982). Why Not Try Some New Ways of Measuring Quality? Educational Record, 63,pp. 10-15.
AVDJIEVA, M. & WILSON, M. 2002. Higher Education Institutions quality initiatives in New Zealand and Australia: Conversations across academic cultures. Herdsa, 2002, pp. 28-34.
BABBIE, E. R. & HALLEY, F. 1995. Adventures in Social Research: Data Analysis Using SPSS for Windows/Book and Disk, Pine Forge Press.
BADRI, M. A. & ABDULLA, M. H. 2004. Awards of excellence in institutions of higher education: an AHP approach. International Journal of Educational Management, 18, pp.224-242.
BALLET, J., KOFFI, J.M. & PELENC, J., 2013. Environment, justice and the capability approach. Ecological Economics, 85, pp.28-34.
BBC 2015. Libya country profile - Overview http://www.bbc.co.uk/news/world-africa-13754897.
BELLWOOD 2004. First Farmers The Origins of Agricultural Societies, Wiley-Blackwell; 1 edition (16 Nov. 2004).
BLACK, S. A. & PORTER, L. J. 1996. Identification of the Critical Factors of TQM. Decision Sciences, 27, pp. 1–21.
BLIZZARD, J. L. & KLOTZ, L. E. 2012. A framework for sustainable whole systems design. Design Studies, 33, pp.456-479.
BOU-LLUSAR, J. C., ESCRIG-TENA, A. B., ROCA-PUIG, V. & BELTRÁN-MARTÍN, I. 2009. An empirical assessment of the EFQM Excellence Model: Evaluation as a TQM framework relative to the MBNQA Model. Journal of Operations Management, 27,pp. 1-22.
BROOKES, M. & BECKET, N. 2007. Quality management in higher education: A review of international issues and practice. International Journal of Quality Standards, 1, pp.85-121.
BRUNDTLAND, G., KHALID, M., AGNELLI, S., AL-ATHEL, S., CHIDZERO, B., FADIKA, L., HAUFF, V., LANG, I., SHIJUN, M. & DE BOTERO, M. M. 1987. Our Common Future (\'Brundtland report\').
BRYMAN, A. 2003. Research methods and organization studies, Routledge.
BSI, G. K. R. G. 2010. Sustainable Development of Total Quality Management through Deming's PDSA Cycle. Mechanical Engineering Department, Kumaraguru College of Technology, The International Journal for Quality and Standards, 1-40.
BURNS, R. B. 2000. Introduction to research methods. SAGE publications. United States of America.
CALVO-MORA, A., LEAL, A. & ROLDÁN, J. L. 2006. Using enablers of the EFQM model to manage institutions of higher education. Quality Assurance in Education, 14, pp.99-122.
CAMERON, K. S. & QUINN, R. E. 2005. Diagnosing and changing organizational culture: Based on the competing values framework, John Wiley & Sons.

CEBRIÁN, G., GRACE, M. & HUMPHRIS, D. 2015. Academic staff engagement in education for sustainable development. Journal of Cleaner Production, 106, pp.79-86.
CERA 2005. An Assessment of the competitiveness of the Libyan Arab Jamahiriya, Tripoli, Libya, . Cambridge Energy Research Associates (CERA).
CHECKPOINT 2006. Quaddafi's Computer Kids http://www.checkpoint-elearning.com/archive/a/. Checkpoint eLearning Infobases GmbH.
CIA 2008. Libya Geography 2008; CIA World Factbook.URL link file:///G:/PhD%20%209%20Nov%2013/Papers/CIA_2008_Libya%20Geography%202008%20CIA%20World%20Factbook.htm. Countries of the World.
CLARK, N. 2013. Education in a Transitional Libya. Available: http://wenr.wes.org/2013/07/education-in-a-transitional-libya/. Last accessed 20th February, 2015.
CLARKE, R. (2000). Appropriate Research Methods for Electronic Commerce. Canberra: Xamax Consultancy.
CLASON, D. L. & DORMODY, T. J. 1994. Analyzing data measured by individual Likert-type items. Journal of Agricultural Education.
CLOTFELTER, C.et al. (2008). Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence From a Policy Intervention in North Caroline. Journal of Public Economics, 92, pp.1352-1370.
COHEN, L., MANION, L.(2013). Research Methods in Education, Taylor & Francis.
COLLIS, J. & HUSSEY, R. 2013. Business Research: A Practical Guide for Undergraduate and Postgraduate Students, Palgrave Macmillan.
COOPER, D. & SCHINDLER, P. 2013. Business Research Methods: 12th Edition, McGraw-Hill Higher Education.
COOPER, R. (1992). Implementing Activity-Based Cost Management: Moving from Analysis to Action : Implementation Experiences at Eight Companies, Institute of Management Accountants.
CORBIN, J. & STRAUSS, A. 1990. Basics of qualitative research: Grounded theory procedures and techniques. Basics of qualitative research: Grounded Theory procedures and techniques.
CRESWELL, J. W. 2013. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, SAGE Publications.
CRESWELL, J. W. & CLARK, V. L. P. 2007. Designing and Conducting Mixed Methods Research, SAGE Publications.
CROSBY, P. 1995. Quality Without Tears: The Art of Hassle-Free Management, McGraw-Hill Education.
CROSBY, P. B. 1979. Quality is Free: The Art of Making Quality Certain, McGraw-Hill.
CSIZMADIA 2003. The role of quality management in satisfying the stakeholder demands. Report. Center for higher education policy studies. University of twenty, Enscheda, the Netherlands. .
CÜNEYT AYDIN, R. C. E., ATINC PIRTI, BÜLENT BAYRAM, M. ALI YÜCEL AND ZERRIN DEMIREL 2006. What is Our Strategy to Perform a Sustainable Development in Education and Research Activities of Our Department? Shaping the Change, XXIII FIG Congress, Munich, Germany, .
CURRY, A. & KADASAH, N. 2002. Focusing on key elements of TQM-evaluation for sustainability. The TQM magazine, 14,pp. 207-216.

DALE, B. G. 1996. Sustaining a process of continuous improvement: definition and key factors. The TQM Magazine, 8,pp. 49-51.
DAVIES, J., DOUGLAS, A. & DOUGLAS, J. 2007. The effect of academic culture on the implementation of the EFQM Excellence Model in UK universities. Quality Assurance in Education, 15, 382-401.
DAW, M. & ELKHAMMAS, E. 2008. Libyan medical education; time to move forward. The Libyan journal of medicine.
DAWTARHONI 2011. Higher Education and Tribal Identity in Modern Libya. Doctoral Thesis. University of Sunderland.UK,
DEAN, J. W. & BOWEN, D. E. (1994). Management Theory and Total Quality: Improving Research and Practice through Theory Development. Academy of Management Review, 19, pp.392-418.
DEDEURWAERDERE, T. 2014. Sustainability science for strong sustainability, Edward Elgar Publishing.
DEMING, W. E. 1982. Quality, Productivity, and Competitive Position, Cambridge, Massachusetts Institute of Technology.
DEMING, W. E. 1986. Out of the crisis, Massachusetts Institute of Technology. Center for advanced engineering study, Cambridge, MA, 510.
DIAS 1998. Quality Management in Higher Education in Mozambique, PhD thesis. School of Education, University of. Wales, Bangor.
DIA, M. (1996). Africa's Management in the 1990 and beyond: Reconciling Indigenous and Transplanted Institutions, World Bank Publications.
DICK, G. & TARÍ, J. J. 2013. A review of quality management research in higher education institutions. Kent Busines School Working Paper Series.
DILLMAN, D. A. 2000. Mail and internet surveys: The tailored design method, Wiley New York.
DMU 2012. A Strategy for Sustainable Development. Board of govenors Meeting. .
DURAKBASA, N., OSANNA, P. & AFJEHI-SADAT, A. 2001. A general approach to workpiece characterization in the frame of GPS (Geometrical Product Specification and Verification). International Journal of Machine Tools and Manufacture, 41,pp. 2147-2151.
EFA, (2002). Assessment-Country Reports: Libyan. World Education Forum.
EFQM 2010. EFQM (2010), Determining Excellence, Taking the first steps- a questionnaire approach . British Quality Foundation
ELHEES, M. A. 2008. An empirical study of quality management in the Libyan higher education context: Al-Fateh University as a case study. University of Wales, Newport.
ELHENSHERI 2004. An Investigation Into Academic, Professional and Pedagogic Aspects of the training Programme For Teachers of English As A Foreign Language At Tripoli University- Libya. PhD thesis De-montfort University.
EISENHARDT, K. et al. (2007). Theory Building from Cases: Opportunities and Challenges. Academy of Management Journal, 50, pp.25-32.
ELKINGTON 2011. Avaiable:"http://www.theguardian.com/sustainable-business/sustainability-with-john-elkington/sustainability-new-total-quality-management", accessed: 10/05/2015.
ELKINGTON, J. 1999. Cannibals with Forks: The Triple Bottom Line of 21st Century Business, new ed., Capstone. Oxford.

ELKINGTON, J. 2004. Enter the triple bottom line. The triple bottom line: Does it all add up, 11,pp. 1-16.

ELMUTI, D., KATHAWALA, Y. & MANIPPALLIL, M. 1996. Are total quality management programmes in higher education worth the effort? International Journal of Quality & Reliability Management, 13, pp. 29-44.

FELLOWS, R. F. and LIU, A. M. (2015). Research Methods for Construction, John Wiley & Sons.

FERGANY, N. 2000. Arab higher education and development: An overview. Almishkat Center for Research, Cairo.

FERKETISH, B. J. & HAYDEN, J. W. 1992. HRD & Quality: The Chicken or the Egg? Training and Development, 46, 38-42.

FF 2010. Avaalibale:https://www.forumforthefuture.org/project/five-capitals/overview.

FISHER, N. & NAIR, V. 2009. Quality management and quality practice: Perspectives on their history and their future. Applied Stochastic Models in Business and Industry, 25, 1-28.

FLOOD, R. L. 1993. Beyond TQM, Wiley.

FLYNN, B., SCHOEDER, R. & SAKIBABA, S. 1994. A framework for quality management research and associated measurement instrument. Journal of Operations Management, 11, 339-66.

FOUND, P., BEALE, J. & RICH, N. 2006. Theoretical model for sustainable change, Cardiff Business School.

FRD 1987. Country studies: Libya. Report of the U. S. Federal research division. Library of Congress. https://cdn.loc.gov/master/frd/frdcstdy/li/libyacountrystud00metz_0/libyacountrystud00metz_0.pdf.

FRD 2005. Country Profile: Libya,Library of Congress – Report of U. S. Federal Research Division 1-18.

GARVARE, R. & ISAKSSON, R. 2001. Sustainable development: extending the scope of business excellence models. Measuring Business Excellence, 5, 11-15.

GARVIN, D. A. 1988. Managing quality: The strategic and competitive edge, Simon and Schuster.

GCR, (2006). The Global Competitiveness Report 2006-2007. World Economic Forum, Geneva, Switzerland 200

GHERBAL, N., SHIBANI, A., SAIDANI, M. & SAGOO, A. Critical Success Factors of Implementing Total Quality Management in Libyan Organisations. Proceedings of the International Conference on Industrial Engineering and Operations Management, Istanbul, Turkey, July, 2012. 3-6.

GOETSCH, D. L. & DAVIS, S. B. 2014. Quality management for organizational excellence, pearson.

GÓMEZ, J. G., MARTÍNEZ COSTA, M. & MARTÍNEZ LORENTE, A. R. 2015. An in-depth review of the internal relationships of the EFQM model. The TQM Journal, 27, pp.486-502.

GOROBETS, A. 2008. An independent Ukraine: Sustainable or unsustainable development? Communist and Post-Communist Studies, 41, 93-103.

GOUGH, G. K. & LONGHURST, J. W. 2015. Embedding sustainability across the curriculum via collaboration: A review of progress in the University of the West of England. Integrating Sustainability Thinking in Science and Engineering Curricula. Springer.

GRBICH, C. 2012. Qualitative data analysis: An introduction, Sage.
GRIEWALD, Y. & RAUSCHMAYER, F. 2014. Exploring an environmental conflict from a capability perspective. Ecological Economics, 100, pp.30-39.
GRUNBERG 2007. "Quality Management Systems in Higher Education: the case of ORT Uruguay University"
GRÜNBERG, J. 2007. Avaialbe:http://www.ort.edu.uy/home/rectorado/pdf/calidadeducativawou.pdf, accessed:01/01/2014.
GSPLAJ 2004. Quality Education for all Young People: Challenges, trendsand priorities .The Development of Education in the Great Jamahiriya. The Great Socialist People's Libyan Arab Jamahiriya , The Libyan National Commission for Education, Culture and Science Libyan National Report Presented at the International Conference on Education, 8 – 11 September 2004.
GSPLAJ 2008. The Great Socialist People Libyan Arab Jamahiriya, Tripoli Declaration United Nationas Education , Scientific and Cultural Organisation , African Conference on Biotechnology.http://www.unesco.org/science/document/Tripoli_declaration_biotechnology.pdf.
GUELLALI, C. 2008. A quality framework for providers of further education in the German context. International Journal of Educational Management, 22, 129-134.
GUEORGUIEV, T. Quality management in higher education. en línia]: En: National Scientific Conference on Quality of Higher Education (1a: 2006: Rousse, Bulgaria). Rousse, Bulgaria: University of Rousse" Angel Kanchev, 2006.
HACKMAN, J. R. & WAGEMAN, R. 1995. Total quality management: Empirical, conceptual, and practical issues. Administrative science quarterly, pp.309-342.
HAHN, G. J., HILL, W. J., HOERL, R. W. & ZINKGRAF, S. A. 1999. The impact of Six Sigma improvement—a glimpse into the future of statistics. The American Statistician, 53, 208-215.
HAMDY, A. 2007. Survey of ICT and Education in Africa: Libya Country Report.
HANSSON, J. (2003). Total Quality Management-Aspects of Implementation and Performance. Unpublished Doctoral Dissertation. Lulea University of Technology.
HARDIE, N. 1998. The effects of quality on business performance. Quality Management Journal, 5, pp.65-83.
HARRY M, S. R. 2003. Six Sigma. The Breakthrough Management Strategy Revolutionising the World's Top Corporations. . Doubleday: New York.
HEDIGER, W. 1999. Reconciling "weak" and "strong" sustainability. International Journal of Social Economics, 26, pp.1120-1144.
HEFCE 2009. Sustainable Development in Higher Education, HEFCE. A Strategy for sustainable Development.
HEMSWORTH, D. 2016. An Empirical Assessment Of The EFQM Excellence Model In Purchasing. The International Business & Economics Research Journal (Online),. https://scholar.google.co.uk/scholar?q=+An+Empirical+Assessment+Of+The+EFQM+Excellence+Model+In+Purchasing&btnG=&hl=en&as_sdt=0%2C5&as_vis=1.

HIDES, M. T., DAVIES, J. & JACKSON, S. 2004. Implementation of EFQM excellence model self-assessment in the UK higher education sector-lessons learned from other sectors. The TQM magazine, 16, 194-201.
HOFSTEDE, G. (1993). Culthural Constraints in Management Theories. The Academy of Managemant Executive, 7. 81-94.
HOGG, E. 1995. Continuous Quality Improvement in Higher Education. International statistical review. . pp. 35 - 48.
HOLMES, G. & MCELWEE, G. 1995. Total quality management in higher education: how to approach human resource management. The TQM Magazine, 7, pp.5-10.
HOQUE, Z. 2006. Methodological issues in accounting research: theories, methods and issues, Spiramus Press Ltd.
HOSNY, S., EL WAZIR, Y., EL KALIOBY, M., FAROUK, O. & GHALY, M. 2016. Role of Suez Canal University, Faculty of Medicine in Egyptian Medical Education Reform. Health Professions Education, 2, 44-50.
HOYLE, D. 2009. ISO 9000 Quality Systems Handbook: Using the standards as a framework for business improvement, Routledge.
HUGHES, J. 1997. The philosophy of social research. Essex, London".
HUSSEIN, N., Mohamad, A., Noordin, F. and Ishak, N.A., 2014. Learning organization and its effect on organizational performance and organizational innovativeness: A proposed framework for Malaysian Public Institutions of Higher Education. Procedia-Social and Behavioral Sciences, 130, pp.299-304.
IN'AIRAT, M. H. & AL-KASSEM, A. H. 2014. Total Quality Management in Higher Education: A Review. International Journal of Human Resource Studies, 4, 294.
INHEA 2015. International Network for Higher Education in Africa. Libya Higher Education Profile. https://www.bc.edu/research/cihe/inhea/african-higher-education-news/malawi11.html
ISAKSSON2004, R. Total quality management for sustainable development: focus on processes. Lulea University of Technology, Sweden,2004.
ISAKSSON, R. 2005. Economic sustainability and the cost of poor quality. Corporate Social Responsibility and Environmental Management, 12, 197-209.
ISAKSSON, R. & GARVARE, R. 2003. Measuring sustainable development using process models. Managerial Auditing Journal, 18, 649-656.
ISAKSSON, R. & WIKLUND, H. Assessing the level of management commitment for TQM core values–an introduction to more effective change. Proceedings of the 6th World Conference of TQM, St Petersburg, 20-22 June, 2001. Division of Quality Technology and Statistics, Luleå University of Technology, 247-54.
ISO, 2009. International Organisation for Standaradisation. URL;http://www.iso.org/iso/iso_catalogue management_standards/iso_9000_iso_14000.
ISO, (2006). “Quality Management System- Fundamental and Vocabulary". International Organisation for Standardisation, Geneva.
JAKOBSSON, U. 2004. Statistical presentation and analysis of ordinal data in nursing research. Scandinavian journal of caring sciences, 18, 437-440.
JAMES, P. 1994. Quality and the environment: from total quality management to sustainable quality management. Greener Management International, 6, 62-70.
JANES, J. 1999. Survey construction. Library Hi Tech, 17, 321-325.

JELIAZKOVA, M. & WESTERHEIJDEN, D. F. 2002. Systemic adaptation to a changing environment: Towards a next generation of quality assurance models. Higher Education, 44, 433-448.
JONES, I. 1997. Mixing qualitative and quantitative methods in sports fan research. The Qualitative Report, 3, 1-8.
JOSEPH, M., YAKHOU, M. (2005). An Educational Institution's Quest for Service Quality: Customer's Perspective. Quality Assurance in Education, 13,pp. 66-82
JOSÉ TARÍ, J. 2006. An EFQM model self-assessment exercise at a Spanish university. Journal of Educational Administration, 44, 170-188.
JURAN, J. M. 2003. Juran on leadership for quality, Simon and Schuster.
JURAN, J. M. A. G., F. M,"Quality Planning And Analysis: From Product Development Through Use",New York, Ny, Mcgraw-Hill 1993.
KAIVOLA, T. & ROHWEDER, L. 2007a. Available:http://www.minedu.fi/export/sites/default/OPM/Julkaisut/2007/liittet/opm06.pdf, accessed 12/05/2015.
KAIVOLA, T. & ROHWEDER, L. 2007b. Towards sustainable development in higher education–reflections. Publications of the Ministry of Education • Department for Education and Science policy,Finland 2007, 6.
KANJI, G. K., MALEK, A. & TAMBI, B. A. 1999. Total quality management in UK higher education institutions. Total Quality Management, 10, 129-153.
KAPLAN , R. S. A. N., D.P.(1992), 1992. implementing activity-based cost management : moving from analysis to action : implementation experiences at eight companies Montvale. , NJ: Institute of Management Accountants, 1.992.
KARAHAN, M. & METE, M. 2014. Examination of total quality management practices in higher education in the context of quality sufficiency. Procedia-Social and Behavioral Sciences, 109, pp.1292-1297.
KARSTEN, L. & PENNINK, B. J. W. 2007. Total Quality Management in the African business community of Burkina Faso: a change in perspective on knowledge development, Centre for Development Studies, University of Groningen.
KARUPPUSAMI, G. & GANDHINATHAN, R. 2006. Pareto analysis of critical success factors of total quality management: A literature review and analysis. The TQM magazine, 18, pp.372-385.
KEMP, A., PRYOR, S. & DALE, B. 1997. Sustaining TQM: a case study at Aeroquip Iberica. The TQM Magazine, 9, pp. 21-28.
KERLINGER, F. N. & LEE, H. B. 2000. Foundations of Behavioral Research, Harcourt College Publishers.
KHANAM, S., SIDDIQUI, J. & TALIB, F. 2016. Role of information technology in total quality management: a literature review. Khanam, S, Siddiqui, J. and Talib, F.(2013),"Role of Information Technology in Total Quality Management: A Literature Review", International Journal of Advanced Research in Computer Engineering and Technology, 2, pp. 2433-2445.
KNIGHT, S.-A. 2008. User perceptions of information quality in World Wide Web information retrieval behaviour. Edith Cowan University.
KOSTOVA, T. 1999. Transnational transfer of strategic organizational practices: A contextual perspective. Academy of management review, 24, pp. 308-324.
KULDVEE, M. A. n.d. Quality Management VS QualityControl: Latest Developments in Estonian Higher Education, Curricula Accreditation and Quality Management Assistant, . Tallinn University).

KUMAR, A., MOTWANI, J., DOUGLAS, C. & DAS, N. 1999. A quality competitiveness index for benchmarking. Benchmarking: An International Journal, 6, pp.12-21.
KUMAR, A., STECKE, K. E. & MOTWANI, J. G. 2004. An analytical framework to measure, benchmark, and improve the strategic position of an organization using a quality competitiveness index. International Journal of Operations and Quantitative Management, 10, 87-124.
LEEDY, P. D.and ORMROD,J. E. (2005). Practical research. Planning and design.
LEVINE, L. & MOHR, B. J. 1998. Whole System Design (WSD) The Shifting Focus of Attention and the Threshold Challenge. The Journal of Applied Behavioral Science, 34, pp.305-326.
LI, J.-H., ANDERSON, A. R. & HARRISON, R. T. 2003. Total quality management principles and practices in China. International Journal of Quality & Reliability Management, 20, pp.1026-1050.
LIM, D. 2001. Quality assurance in higher education, Ashgate Aldershot,, UK.
LIT 2003. Total quality management principles and practices in China. International Business School of Nankai University, Tianjin, People's Republic of China, International Journal of Quality & Reliability Management,Vol. 20 No. 9, 2003, pp. 1026-1050.
LITWIN, M. S. 1995. How to measure survey reliability and validity, Sage Publications.
LOOKLEX 2009. Libya Economy, http://looklex.com/e.o/libya.economy.htm.
LOUIS, E. A. 1991. "Research perspectives", in Craig Smith, N. and dainty, P. (Eds), The Management Research Book,, London: Rutledge.
LOPEZ-CLAROS, A. and SCHAW, K. E. (2005). The global competitiveness report 2005- 2006 World Economic Forum: Policies underpinning rising prosperity, Palgrave.
LOZANO-ROS, R. 2003. Sustainable development in higher education. Incorporation, assessment and reporting of sustainable development in higher education institutions. IIIEE. Lund: Lund University.
LUCAS, L. 2014. Academic resistance to quality assurance processes in higher education in the UK. Policy and Society, 33, pp.215-224.
LUND, K. & THOMSEN, C. 1994. How to sustain the total quality management process after the first 12 months. The TQM magazine, 6, 47-49.
MANDERS, B., DE VRIES, H. J. & BLIND, K. 2016. ISO 9001 and product innovation: A literature review and research framework. Technovation, 48, 41-55.
MANGAN, J., LALWANI, C. & GARDNER, B. 2004. Combining quantitative and qualitative methodologies in logistics research. International journal of physical distribution & logistics management, 34, 565-578.
MARTÍN-CASTILLA, J. I. & RODRIGUEZ-RUIZ, O. 2008. EFQM model: knowledge governance and competitive advantage. Journal of Intellectual Capital, 9, 133-156.
MATTISEN, H. and KULDVEE, B. n.d external regulations and internal regulations (institutional self- regulations).
MAXWELL, J. A. (2012). Qualitative research design: An interactive approach, Sage.
MARTINS, N. 2011. Sustainability economics, ontology and the capability approach. Ecological Economics, 72, 1-4.

MEHRALIZADEH, Y. & SAFAEEMOGHADDAM, M. 2010. The applicability of quality management systems and models to higher education: A new perspective. The TQM Journal, 22, 175-187.
MELVILLE, S. and GODDARD, W. (1996). Research Methodology: An introduction for science and engineering students. Juta & Co Ltd,Cope Town, South Africa.
MILES, M. B., HUBERMAN, A. M. & SALDANA, J. 2013. Qualitative Data Analysis: A Methods Sourcebook, SAGE Publications.
MINCER, J. 1962. On-the-job training: Costs, returns, and some implications.The Journal of Political Economy, pp.50-79.
MOHAMED, A. et al. (2005). Distance Higher Education in The Arab Region: The need for quality assurance frameworks. Online Journal of distance learning administration.
MOHAMMED, K., ALI, B. & ABDULAZIZ, A. 2016. Total Quality Management in Saudi Higher Education. International Journal of Computer Applications, pp.135, 6-12.
MO, Q., 2014, January. Construction of Quality Management System of Higher Educational Administrations Based on the ISO9000 Groups of Standards. In 2014 International Conference on Education Reform and Modern Management (ERMM-14). Atlantis Press
MORGAN, D.et al (2007). Paradigms lost and Pragmatism Regained Methodological Implications of Combining Qualitative and Quantitative Methods. Journal of mixed methods research, 1, 48-76.
MOTWANI, J. (2001). Critical Factors and Performance Measures of TQM. The TQM magazine, 13,292- 300.
MÜLLER-CHRIST, G., STERLING, S., VAN DAM-MIERAS, R., ADOMßENT, M., FISCHER, D. & RIECKMANN, M. 2014. The role of campus, curriculum, and community in higher education for sustainable development–a conference report. Journal of Cleaner Production, 62, 134-137.
MURPHY, C. N. and YATES, J. (2009). The International Organization for Standardization (ISO): Global Governance Thtough Voluntary Consensus, Taylor & Francis.

NAPIERALA, B. et al. 2012. Five important factors in total quality management. Aboutthree.com. Retrieved [Online].
NAQIB, I.et al (.2005). Quality Assessment of Comuter Science and Business Administrstion Education in Arab Universities: A Regional Overview Report, Regional Bureau for Arab States.
NATIONS, U. et al. (2013). Agenda 21: Earth Summit: The United Nations Programme of Action from Rio, Create Space Independent Publishing Platform.
NATIONS, U. U. (2012), http://esa.un.org/unpd/wpp/.World Population Prospects,
NCES 2009. The Condition of Education 2009 in Brief" National Center for Education Statistics, U.S. Department of Education U.S. Department of Education.
NEUMAYER, E. 2012. Human development and sustainability. Journal of Human Development and Capabilities, 13, 561-579.
NEWMAN, I. & MCNEIL, K. A. 1998. Conducting survey research in the social sciences, University Press of America.
NGWIRA, T.,et al. Quality management initiatives in higher education institutions of SADC countries. Book of Abstracts, Deutscher Tropentag, 2003. 8-10.

NI 2009. Libya Education History. Online publication of Net Industries,Avalable "http://education.stateuniversity.com/pages/855/Libya-HISTORY-BACKGROUND.html">Libya - History & Background. Accessed 2014.
NONGKAS, C. M. 2007. Leading educational change in primary teacher education: A Papua New Guinea study. Australian Catholic University.
NRGLJ 2008. The National Report of the Great Libyan Jamahiriya, Geneva,25-28 November 2008, Tripoli. The International Conference on Education Session 48.
O'MAHONY, K. & GARAVAN, T. N. 2012. Implementing a quality management framework in a higher education organisation: A case study. Quality Assurance in Education, 20, pp.184-200.
OPPENHEIM, A. N. (2000). Questionnaire design, interviewing and attitude measurement, Bloomsbury Publishing.
OAKLAND, J. 2003a. Total quality management -Text with cases, Oxford, Butterworth Heinemann.
OAKLAND, J. S. 2003b. Total quality management: text with cases, Routledge.
OBEIDI, A. 2013. Political Culture in Libya, Taylor & Francis.
OPPENHEIM, A. N. 2000. Questionnaire design, interviewing and attitude measurement, Bloomsbury Publishing.
OSSEO-ASARE, A. E. 2004. Sustaining quality improvement in UK higher education through effective management of best practices. University of Derby.
OSSEO-ASARE, A. E., LONGBOTTOM, D. & CHOURIDES, P. 2007. Managerial leadership for total quality improvement in UK higher education. The TQM Magazine, 19, pp. 541-560.
PANDE, P., NEUMAN, R. & CAVANAGH, R. 2000. The Six Sigma Way: How GE, Motorola, and Other Top Companies are Honing Their Performance: How GE, Motorola, and Other Top Companies are Honing Their Performance, McGraw-Hill Education.
PATTON, M. Q. (1996). Utilization-Focused Evaluation: The New Century Text, SAGE Publications.
PELENC, J. & BALLET, J. 2015. Strong sustainability, critical natural capital and the capability approach. Ecological economics, 112, 36-44.
PLANTY, M., et al. (2009). The Condition of Education, Brief. NCES 2009-082 National Center for Education Statistics.
POLISHCHUK, Y. & RAUSCHMAYER, F. 2012. Beyond “benefits”? Looking at ecosystem services through the capability approach. Ecological Economics, 81, 103-111.
POWELL, T. C. 1995. Total quality management as competitive advantage: A review and empirical study. Strategic Management Study, 16, 15-37.
RADFORD, J. 1997. Quantity and quality in higher education, Readers Digest.
RAFIK. T.A.,et al. n.d. An investigation into the Technical Skills Gaps in the Libyan Manufacturing Industry Manufacturing Industry. University of Wales, Institute, Cardiff (UWIC)-Academic Development, Cardiff, UK
RAFFE, D., GALLACHER, J. and TOMAN, N., 2008. The Scottish Credit and Qualifications Framework: Lessons for the EQF. European journal of vocational training, 42(1), pp.59-69.
RAWSON, J. V., KANNAN, A. & FURMAN, M. 2016. Use of Process Improvement Tools in Radiology. Current problems in diagnostic radiology, 45, 94-100.

REDMOND, R., CURTIS, E., NOONE, T. & KEENAN, P. 2008. Quality in higher education: The contribution of Edward Deming's principles. International Journal of Educational Management, 22, pp.432-441.
REED, R., LEMAK, D. J. & MERO, N. P. 2000. Total quality management and sustainable competitive advantage. Journal of quality management, 5, 5-26.
ROBSON, A., PRABHU, V. B. & MITCHELL, E. 2002. TQM enablers and business sustainability: An empirical study of the service sector in the North East of England. International Journal of Quality & Reliability Management, 19, 610-632.
ROBSON, C. 2002. Real World Research: A Resource for Social Scientists and Practitioner-Researchers, Wiley.
ROSA, M. J., AMARAL, A. & SARRICO, C. S. 2012. Implementing quality management systems in higher education institutions, INTECH Open Access Publisher.
ROWE, K. & INGVARSON, L. Conceptualising and evaluating teacher quality: Substantive and methodological issues. Proceedings of Workshop on Teacher Quality. Canberra, ACT: Australian National University, 2007.
RUSINKO, C. A. 2005. Using quality management as a bridge to environmental sustainability in organizations. SAM Advanced Management Journal, 70, 54.
SABET, H. S., SALEKI, Z. S., ROUMI, B. & DEZFOULIAN, A. 2012. A study on total quality management in higher education industry in Malaysia. International Journal of Business and Social Science, 3.
SAGAR, A. D. & NAJAM, A. 1998. The human development index: a critical review. Ecological economics, 25, 249-264.
SALEM, M. S. & PITT, D. C. 2008. Benchmarking implementation problems in the context of Libyan manufacturing organisations. International Journal of Accounting, Auditing and Performance Evaluation, 5, 203-227.
SARAPH, J. V., BENSON, P. G. & SCHROEDER, R. G. 1989. An instrument for measuring the critical factors of quality management. Decision Sciences, 20, 810–829.
SAUNDERS, M., LEWIS,P.,AND THORNHILL,ALIP 2003. Research methods for business students.(3rd edn). London: Financial times prentice hall, 4.
SAUNDERS, M. L. T., A. 2007. Research methods for business students (5th ed): Pearson Education Limited.
SAWAHEL, W. 2009. LIBYA: New era of higher education reform ,http://www.universityworldnews.com/article.php?story=20090402214437752.
SCANDURA, T. et al. (2000). Research Methodology in Management: Current Practices, trends, and implications for future research. Academy of Management Journal, 43, pp.1248- 1264.
SCHEIN, E. H. 1985. Organisational culture and leadership: A dynamic view. San Francisco.
SCHNEIDER, B., BRIEF, A. P. & GUZZO, R. A. 1996. Creating a climate and culture for sustainable organizational change. Organizational dynamics, 24, 7-19.
SCHONBERGER, R. J. 1992. Total quality management cuts a broad swath—through manufacturing and beyond 078. Organizational Dynamics, 20, 16-28.
SCHULZ, S. A., FLANIGAN, R. L., JOHNSTON, W. & JOHNSTON, W. 2016. Developing competitive advantage using the triple bottom line: a conceptual framework. Journal of Business & Industrial Marketing, 31.

SEALE, C. 1999. Quality in qualitative research. Qualitative inquiry, 5, 465-478.
SEGOVIA, V. M. & GALANG, A. P. 2002. Sustainable development in higher education in the Philippines: The case of Miriam College. Higher Education Policy, 15, 187-195.
SEKARAN, U. & BOUGIE, R. 1992. Research Methods for Business: a Skill-Building Approach, John Willey and Sons, Inc. Singapore.
SELVARATNAM, R. M. 2005. In Electronic Education, Does Total Quality Exist in The Experiences of The Customer Rather Than The Aspirations of The Supplier. Sunway Academic Journal, 2, 33-43.
SEYMOUR, D. T. 1992. On Q: Causing Quality in Higher Education, ERIC.
SHAPIRO, D. L., KIRKMAN, B. L. & COURTNEY, H. G. 2007. Perceived causes and solutions of the translation problem in management research. Academy of Management Journal, 50, 249-266.
SHARIFI, M., SHAHRIARI, M. & GOLZARI, O. 2015. A Study on the Effects of EFQM Excellence Model with Regard to Customer Results in Mazandaran Province Gas Company (MPGC). Journal of Current Research in Science, 3, 96.
SHERIDAN, G. 1997. Tigers, leaders of the new Asia Pacific.
SHEWHART, W. A. 1931. Economic control of quality of manufactured product, ASQ Quality Press.
SHIBANI, A., SAIDANI, M. & GHERBAL, N. 2012. An evaluation of obstacles preventing implementation of TQM in Libyan organisations. Business and Management Research Journal, 1, 84-91.
SHOKSHOK, M. A. 2014. Quality Culture Framework Proposal for Libyan Industrial Companies. World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 8,pp. 2236-2239.
SHRIBERG, M. 2002. Institutional assessment tools for sustainability in higher education: strengths, weaknesses, and implications for practice and theory. International Journal of Sustainability in Higher Education, 3, pp.254-270.
SIEGEL, S. (2008). Nonparametric Statistics, file:///G:/PhD%20%209%20Nov%2013/Papers Kruskal%20wallis%20stat%20explanation.htm
SIRVANCI, M. B. 2004. Critical issues for TQM implementation in higher education. The TQM Magazine, 16, pp.382-386.
SMITH, A. M. (2012). Research Methodoloy. A Step -by-step Guide for Beginners. Nurse Education in Practice, 3, e25
SMITH, M. 2003. Business process design: Correlates of success and failure. The Quality Management Journal.
SPASOS, S, et al. (2008). Implementation of EFQM model in a Greek Engineering Higher Education Institute: A Framework and a case study. International Journal for Quality Research, 2, pp.43-50
SPOWERS, H. 2006. A "whole system design" approach to personal transport. lABSE Henderson colloquium. Cambridge, UK, 10-12 July 2006.
SRS (2010) Sustainable Quality Management. Web site of Studio Ricerche Sociali, Italy. URL <http://www.srseuropa.eu/eng/Sistema_SQM.php>. Accessed in April 2010.

SRIKANTHAN, G. & DALRYMPLE, J. 2001. A fresh approach to a model for quality in Higher Education. Integrated Management,pp. 566-572.
SRIKANTHAN, G. & DALRYMPLE, J. F. 2002. Developing a holistic model for quality in higher education. Quality in Higher Education, 8, pp.215-224.
SRINIVASAN, T. N. 1994. Human development: a new paradigm or reinvention of the wheel? The American Economic Review, 238-243.
STEED, C., MASLOW, D. & MAZALETSKAYA, A. 2005. The EFQM Excellence Model for Deploying Quality Management: A British-Russian Journey. Higher education in Europe, 30, 307-319.
STILES, J. 2003. A philosophical justification for a realist approach to strategic alliance research. Qualitative Market Research: An International Journal, 6, 263-271.
STRAUSS, A. L. & CORBIN, J. M. 1990. Basics of qualitative research: grounded theory procedures and techniques, Sage Publications.
SUNDER M, V. 2016. Lean six sigma project management–a stakeholder management perspective. The TQM Journal, 28, 132-150.
SUNDER, M. V. 2014. Quality excellence in higher education system through Six Sigma: student team engagement model. International Journal of Six Sigma and Competitive Advantage, 8, 247-256.
SVENSSON, G. 2006. Sustainable quality management: a strategic perspective. Lulea University of technology. Sweden,.
SVENSSON, M. 2004. TQM-based self-assessment in educational organizations help or hindrance? Lulea University of technology. Sweden.
TADDESE, F. and OSADA, H. (2010). Process Techno-innovation using TQM in developing countries,empirical study of Deming prize winners. Journal of technology management & innovation, 5, pp.47-65.
TADDESE, F. & OSADA, H. 2010. Process Techno-innovation using TQM in developing countries empirical study of deming prize winners. Journal of technology management & innovation, 5, 47-65.
TAGUCHI, G. & ORGANIZATION, A. P. 1986. Introduction to quality engineering: designing quality into products and processes, The Organization.
TANTAWI, A. M. M. 2005. Climate Change in Libya and Desertification of Jifara Plain: Using Geographical Information System and Remote Sensing Techniques.
TAPPESER 2002. Structural Funds and Sustainable Development TheSQM approach. EURES Institute Freiburg.
TARÍ, J. J. & JUANA-ESPINOSA, S. D. 2007. EFQM model self-assessment using a questionnaire approach in university administrative services. The TQM Magazine, 19, 604-616.
TAYLOR, R. K. A. 2003. Continuous improvement strategies in higher education: A progress report. Research Bulletin, . ECAR, Educause Centre for Applied Research, Colorado, USA, 1 - 12.
TERVONEN, P., PAHKALA, N. & HAAPASALO, H. 2008. Critical incidents in the development of quality management in steel manufacturers' production. International Journal of Business Excellence, 1, 106-120.
THIAGARAJAN, T. and ZAIRI, M. (1998). An empirical analysis of critical factors of TQM: A proposal tool for self-assessment and benchmarking purposes. Benchmarking for Quality Management & Technology, 5, pp.291-303.

THACKWRAY, B. & HAMBLIN, H. 1996. Total quality management, investors in people and higher education. Engineering Science & Education Journal, 5, 113-119.
THIERSTEIN, A. & WALSER, M. 2005. Quality management of projects on sustainable development: an evaluation framework. Working Paper.
THOMPSON, J. et al. (2011). Organizations in Action Social Science Bases of Administrative Theory, Transaction Publishers.
THOMPSON, J. L. & MARTIN, F. 2010. Strategic Management: Awareness & Change, South-Western Cengage Learning.
THOMPSON, M.(2001). Theory of Sample Surveys, Chapman and Hall, London. Taylor & Francis.
TODORUT, A. V. 2013. The need of Total Quality Management in higher education. Procedia-Social and Behavioral Sciences, 83, 1105-1110.
TROMPENAARS, F. & HAMPDEN-TURNER, C. 1999. Riding the waves of culture. COMPETENCY-LONDON-, 6, pp.19-29.
TWAISSI, N. M. 2008. An evaluation of the implementation of Total Quality Management (TQM) within the Information and Communications Technology (ICT) sector in Jordan. University of Huddersfield.
UGBORO, I. O. & OBENG, K. 2000. Top management leadership, employee empowerment, job satisfaction, and customer satisfaction in TQM organizations: an empirical study. Journal of Quality Management, 5, 247-272.
UN, (2012) United National, World Population Prospects, http://esa.un.org/unpd/wpp/
UNCED 1994. Agenda 21: Programme of Action for Sustainable Development: Rio Declaration on Environment and Development : Statement of Forest Principles : the Final Text of Agreements Negotiated by Governments at the United Nations Conference on Environment and Development (UNCED) 3-14 Juni 1992, Rio de Janeiro, Brazil, UN.
UNDP 2002. , (United Nation Development Program). Arab Human Development Report
(AHDR). National Press Amman, Jordan. (AHDR). National Press Amman, Jordan.
UNDP 2005. Quality assessment of Computer Science and business administration education in Arab Universities. Project report of the United Nations development programme. Reference: RAB / 01 / 002. “Enhancement of Quality Assurance and Institutional Planning at Arab Universities”. Available through: United Nations Publications, Room DC2 853, New York, NY 10017, USA.
UNDP 2008 Human Development Report of Libya: 2007 - 2008 web site accessed in June 2011.
UNDP 2014. Human Development Report 2014,. United Nations Development Programme, (UNDP).
UNESCO 1998. The participants to the Arab States Regional Conference on Higher Education for the XXIst Century, held in Beirut, Lebanon,G:\PhD 9 Nov 13\Papers\UNESCO_1998_ Beirut Declaration_Resolution 15_Follow-up to the World Conference on Higher Education.mht. Beirut, Lebanon.
UNESCO 2009. A decade of higher education in the Arab states: achievements and challenges. Report on the Arab Regional Conference on Higher Education.
UNESCO 2011. Global Education Digest Comparing Education Statistics across the World

http://www.uis.unesco.org/Library/Documents/global_education_digest_2011_en.pdf
UNESCO 2014. UNESCO Institute for Statistics, Country profile, Libya Education , www.uis.unesco.org/DataCentre/Pages/country-profile.aspx?code=LBY.
United Nations Education, Scientific and Cultural Organisation, African Conference
UNESCO, E. F. 2004. Global Monitoring Report 2003/4.
USCB 2008. Population Pyramids of Libya. U. S. Census Bureau, Polpulation Division, International Data Base, https://niaprodfiles.s3.amazonaws.com/s3fs-public/AgingWorld2008-web.pdf.
USDS 2004. Annual Report on International Religious Freedom, , . U.S. Department of State. Released by the Bureau for Democracy, Human Rights, and Labor. September 15 2004. Washington, DC.
UWE 2012. Sustainability Strategy 2008/2012. University of the West of England , Bristol, SB.STRA.001. V 1, pp.1-13.
VAN DER WIELE, T. & BROWN, A. 2002. Quality management over a decade: A longitudinal study. International Journal of Quality & Reliability Management, 19, pp.508-523.
VAN SCHOTEN, S., DE BLOK, C., SPREEUWENBERG, P., GROENEWEGEN, P. & WAGNER, C. 2016. The EFQM Model as a framework for total quality management in healthcare: Results of a longitudinal quantitative study. International Journal of Operations & Production Management, 36, pp.901-922.
VERMA, J. S. 2004. Available:http://naac.gov.in/docs/Quality%20Higher%20Education%20and%20Sustainable%20Development.pdf,accessed:12/10/2015.
VIGDERHOUS, G. 1977. The level of measurement and" permissible" statistical analysis in social research. Pacific Sociological Review,pp. 61-72.
WALS, A. E. 2013. Sustainability in higher education in the context of the UN DESD: a review of learning and institutionalization processes. Journal of Cleaner Production, 62, pp.8-15.
WANG, L. 2014. Quality assurance in higher education in China: Control, accountability and freedom. Policy and Society, 33, pp.253-262.
WEIDEMAN, R. 2008. Evaluation criteria for selected administrative and support systems in South African Higher Education institutions.
WEINRIB, J. & JONES, G. A. 2014. Largely a matter of degrees: Quality assurance and Canadian universities. Policy and Society, 33, pp.225-236.
WORLD BANK 2013. the Africa Competitiveness Report 2013. World Economic Forum.
http://www3.weforum.org/docs/WEF_Africa_Competitiveness_Report_2013.pdf. World Economic Forum.
WORLD BANK 2015. http://reports.weforum.org/africa-competitiveness-report-2015/economies/economy=LBY Africa Competitiveness Report 2015,. World Economic Forum.
WRIGHT, J. 1981. Libya: a modern history, Taylor & Francis.
YAHIA, A. F. 2008. The effects of the fluctuations in oil prices on the performance of the Libyan economy.

YEH, Y.-J. 2003. Implementing a sustainable TQM system: employee focus. The TQM Magazine, 15, 257-265.
YOUSSEF, S. 2006. Total quality management framework for Libyan process and manufacturing industries.
YUSOF, S. R. M. & ASPINWALL, E. M. 2000. Critical success factors in small and medium enterprises: survey results. Total quality management, 11, pp.448-462.
ZAGHOUAN, D. B. H. 2009. Indicators and Standards of Quality in Libya Higher Education. presentation. Tripoli University, June 2009, Tripoli, Libya.
ZAILANI, S. H. M. 2009. Quality challenges in the new millennium: A study of the diverse workforce attitude to quality. Course Paper. School of Management, University Sains Malaysia.
ZAIRI, M. 2002. Beyond TQM implementation: the new paradigm of TQM sustainability. Total Quality Management, 13, pp.1161-1172.
ZAIRI, M. 2005. TQM Sustainability: How to maintain its gains through Transformational Change, Citeseer.
ZAKUAN, N., et al. 2012. Critical success factors of total quality management implementation in higher education institution: a review. International Journal of Academic Research in Business and Social Sciences.
ZBARACKI, M. J. 1998. The rhetoric and reality of total quality management. Administrative science quarterly,pp. 602-636.
ZHANG, Z. 2001. Implementation of total quality management: an empirical study of Chinese manufacturing firms. University of Groningen.
ZINK 2007. From total quality management to corporate sustainability based on a stakeholder management. Journal of Management History 4, pp. 394-401.
ZUBAIR, S. S. 2013. Total Quality Management in Public Sector Higher Education Institutions. Journal of Business & Economics.
ZUTSHI, A. & SOHAL, A. 2004. A study of the environmental management system (EMS) adoption process within Australasian organisations—2. Role of stakeholders. Technovation, 24, pp.371-386.
ZWAIN, A. A. A. 2012. The Impact of Total Quality Management of Knowledge Management and Organizational Performance in Higher Education Institutions in Iraq. Universiti Utara Malaysia.
ZWANIKKEN, P. A., PETERHANS, B., DARDIS, L. & SCHERPBIER, A. 2013. Quality assurance in transnational higher education: a case study of the trooped network. BMC medical education.

Appendices

Appendix A: Interviews with quality management officials at Libyan government, Quality Centre and two universities

Table A-1: management officials at Libyan government, Quality Centre and two universities

Interview	***Respondent***
1	*Secretary of Higher Education and Science Research.*
2	*Directors of Quality Centre in Ministry of Higher Education and Science Research.*
3	*Director in the Quality Assurance and Accreditation Centre. (QAAC).*
4	*Director of Quality Management at QAAC.*
5	*Dean of Faculty of Education at Tripoli University*
6	*Dean of the University of Gharyan*
7	*Dean of the University of Tripoli.*
8	*An interview with Director of Graduate Studies at the University of Gharyan:*
9	*Director of the Office of Quality at the University of Gharyan.*
10	*An interview with the Director of the Office of Quality Management at the University of Tripoli.*
11	*Faculty of member at faculty of dentist at the University of Gharyan.*
12	*The Director of Quality at the faculty of Dentist at Tripoli University.*
13	*A research master's in Libya (The Quality of Higher Education Institutions) at the Gharyan University.*
14	*Minister of Higher Education and scientific Research.*
15	*Researcher in Quality Management in the Libyan University. PhD researcher at the Academy of Sciences administrative and financial state of Jordan. At Tripoli University*
16	*The Director of Quality in the Faculty of Medicine at the University of Gharyan.*
17	*The director of graduate studies at the University of Tripoli.*
18	*The leader of faculty of Low at University of Gharyan*

19	*The dean of faculty Sciences at Tripoli University.*
20	*The Leader of the quality Assurance Centre for Quality of Higher Education.*
21	*The Leader at Faculty of Economic at Tripoli University.*
22	*Faculty of member in faculty of medicine at Tripoli University.*
23	*Director of Quality in the Faculty of Engineering at the University of Gharyan.*
24	*Director of quality management at Quality Assurance and accreditation Centre in Tripoli.*
25	*Faculty member in faculty of Account at Gharyan University.*
26	Faculty of member at Tripoli University. Faculty of Economic.
27	*Faculty member in school of Education at Tripoli University.*
28	*Faculty member in school of Arts at Tripoli University*
29	*Faculty of member in faculty of dentist at Tripoli University.*
30	*Faculty member in school of Engineering at Gharyan University.*
31	*Faculty of member in faculty of medicine at Gharyan University.*

Appendix B: Beta Questionnaires Format

Dear Respondent,

At present I am conducting my Doctoral Research on Sustainable Quality Management (SQM) in Higher Education. The study aims to evaluate quality models for the Libyan higher education system.

Towards this, **four formats** of survey questions have been designed and I would greatly appreciate it if you could spend a few minutes of your valuable time comparing and evaluating them; Example questions relating to issues of leadership are presented on the following pages. PLEASE ENTER YOUR SCORE FOR EACH FORMAT IN THE EVALUATION TABLE AT THE END OF THIS DOCUMENT.

All your responses will be treated confidential and the results will be used for this research only. Access to data is will be restricted to my supervisor and myself.

Many thanks.

Mabrouka Khoja

For any enquires about the survey you can contact me:

Tel: 07412036348 **E-mail: mkhooja@yahoo.com**

Format 1

1 Leadership

Please indicate which box best represents the role of Senior Management in Libyan Higher Education.

		Very Little → Very Much
1a	Senior management take overall responsibility for Sustainable Quality Management in their organization.	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐
1b	Is involved and participates in Sustainable Quality Management.	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐
1c	Is committed to continuous improvement that includes reviewing every process and implementation of action plans	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐
1d	Is committed to quality training of stakeholders (academic staff, students, administrative staff, etc) in order to improve their awareness on Sustainable Quality Management.	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐

Note: (1= Very Little - 5= Very Much

Format 2

1 Leadership

Please indicate which box best represents the role of Senior Management in Libyan Higher Education.

Senior Management responsibility for quality is **low**	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐	Senior Management responsibility for quality is **High**
Senior Management need to be **less** involved in quality movement	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐	Senior Management need to be **more** involved in quality movement
Its commitment to continuous improvement need to be **minimum**	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐	Its commitment to continuous improvement need to be **maximum**
Its commitment to training stakeholders (Students, academic staff, Parents, community,….etc) need to be **minimum**	1 2 3 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐☐☐☐	Its commitment to training stakeholders (Students, academic staff, parents, community,…etc) need to be **maximum.**

Note: (1= very Low – 5 = Very High)

Format 3

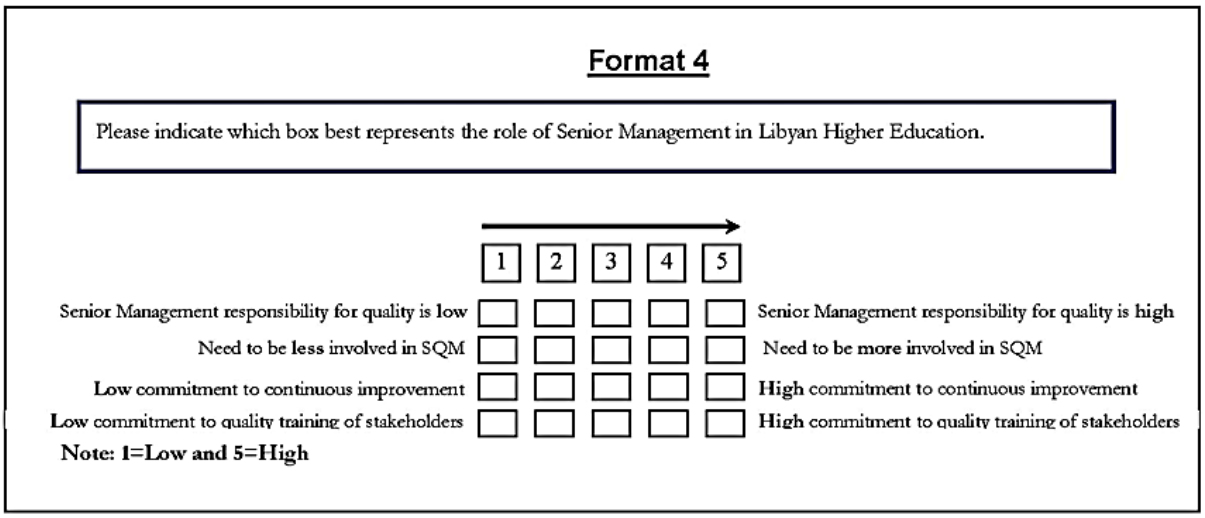
1 Leadership

Please indicate which box best represents the role of Senior Management in Libyan Higher Education.

Very Little → **Very Much**

1a	Senior management takes overall responsibility for Sustainable Quality Management in their organization.	1 2 3 4 5 ☐☐☐☐☐
1b	Is involved and participates in Sustainable Quality Management.	1 2 3 4 5 ☐☐☐☐☐
1c	Is committed to continuous improvement that includes reviewing every process and implementation of action plans	1 2 3 4 5 ☐☐☐☐☐
1d	Is committed to quality training of stakeholders(academic staff, students, administrative,…etc) in order to improve their awareness on Sustainable Quality Management.	1 2 3 4 5 ☐☐☐☐☐

(Note: 1 = Very Little – 5 =Very Much)



Please give your evaluation score in this table for each Format

No.	Criteria	Format 1 (1 = Low – 5 High)	Format 2 (1=Low – 5 High)	Format 3 (1=Low – 5 High)	Format 4 (1=Low – 5 High)
1	Clarity of the questions and statements	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐
2	Your confidence in this scale	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐

Name: _____ Position: _____

Date: _____ Organisation: _____

Page 3 of 3

Figure B-1: Beta Questionnaires Format

Appendix C: Evaluation of Questionnaires

Dear Respondent,

At present I am conducting my Doctoral Research on Sustainable Quality Management in Higher Education. The study aims at evaluation of quality models for Libyan higher education system.

Towards this, two types of questionnaires were designed; A sample is attached for your evaluation:

a. Design Type 1 – 10 Point Likert Scale that is explanatory
b. Design Type 2 – 5 Point Likert Scale that is descriptive

I request you to please spend a few minutes of your valuable time and give your scores for the two types of design attached.

PLEASE GIVE YOUR SCORE ONLY IN THE TABLE BELOW (not in the questionnaire).

All your responses given will be treated with the utmost confidence and the results will be used for this research purposes only. The access to data is restricted to me and to my supervisor only.

For any enquires about the survey you can contact me:

Tel: 07412036348 **E-mail: mkooja@yahoo.com**

No.	Criteria	Your score for Type 1 (10 Likert Scale) Pl. Mark [X] in box	Your score for Type 2 (5 Likert Scale) Pl. Mark [X] in box
1	Understanding the questions in the design	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐
2	Clarity of the questions in the design	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐
3	Completeness of the questions in the design	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐
4	Your confidence to score in this design	1 2 3 4 5 ☐☐☐☐☐	1 2 3 4 5 ☐☐☐☐☐

Name: _____ Position_____

Date: _____ Organisation: _____

1 Leadership

The statements given below this pertains to various Quality Action Programmes (QAPs) of the Deming PDSA and sub – criteria of EFQM quality model pertaining to the role of leadership in Sustainable Quality Management (SQM) of higher education. Please indicate the extent to which leadership is relevant to various aspects described according to your evaluation by **marking [x] in the appropriate box.**

Very Little → **Very Much**

		1 2 3 4 5 6 7 8 9 10
1a	Top leadership and department heads' responsibility for SQM in higher education	☐☐☐☐☐☐☐☐☐☐
1b	Involvement and participation of top leadership in SQM	☐☐☐☐☐☐☐☐☐☐
1c	Leadership commitment to continuous improvement that includes the cycle of reviewing every process and implementation of action plans	☐☐☐☐☐☐☐☐☐☐
1d	The extent of the leadership commitment to quality training of the concerned stakeholders in order to improve their awareness on SQM	☐☐☐☐☐☐☐☐☐☐
1e	The requirement of leadership being aware of natural resources, social and ethical justice and biodiversity	☐☐☐☐☐☐☐☐☐☐
1f	Generating and communicating a strategic statement for the purpose, direction and culture of the organisation	☐☐☐☐☐☐☐☐☐☐
1g	The requirement to meet customers, suppliers and representative of society, and be actively & appropriately involved in promoting partnerships and improvement initiatives	☐☐☐☐☐☐☐☐☐☐
1h	Demonstrating the ability to make sound and timely decisions, based on available information, previous experience and consideration of the impact of their decisions	☐☐☐☐☐☐☐☐☐☐

Design Type 2 – 5 Point Likert Scale

1 Leadership

The statements given below pertains to various Quality Action Programmes (QAPs) of the Deming PDSA and sub – criteria of EFQM quality model on the role of leadership in Sustainable Quality Management (SQM) of higher education. Please indicate the extent to which leadership is relevant to various aspects described according to your evaluation by **marking [x] in the appropriate box.**

	1	2	3	4	5	
Top leaders responsibility for quality is low	☐	☐	☐	☐	☐	Top leaders responsibility for quality is high
Top leaders need to be less involved	☐	☐	☐	☐	☐	Top leaders need to be more involved
Department heads have low responsibility	☐	☐	☐	☐	☐	Department heads have high responsibility
Minimum participation of department heads	☐	☐	☐	☐	☐	Maximum participation of department heads
Low commitment to continuos improvement	☐	☐	☐	☐	☐	High commitment to continuous improvement
Low commitment to quality training	☐	☐	☐	☐	☐	High commitment to quality training
Low capacity to connect to all in the institution	☐	☐	☐	☐	☐	High capacity to connect to all in the institution
Low-level awareness of natural resources	☐	☐	☐	☐	☐	High level of awareness of natural resources
Low level of awareness of ethics and social justice	☐	☐	☐	☐	☐	High level of awareness of ethics and social justice
Need not promote academic freedom	☐	☐	☐	☐	☐	Need to promote academic freedom
Low involvement in quality strategy	☐	☐	☐	☐	☐	High involvement in quality strategy
Unclear of direction and purpose of quality	☐	☐	☐	☐	☐	Clear on direction and purpose of quality
Minimum role in implementation	☐	☐	☐	☐	☐	Maximum role in implementation
Low level of action with suppliers / partnerships	☐	☐	☐	☐	☐	High level of action with suppliers / partnerships
Decisions are not timely and sound	☐	☐	☐	☐	☐	Decisions are timely and sound
Low capacity to understand impact of decisions	☐	☐	☐	☐	☐	High capacity to understand impact of decisions

Figure C-1: Evaluating the Questionnaires

Appendix D: Evaluation of Questionnaires

Questionnaire Serial Number: 001

Dear Respondent,

The term "Sustainable Quality Management" (SQM) refers to the application of sustainable development principles to quality management. This means the development of a quality framework which incorporate the sustainable use of natural resources and does not compromise their availability to future generations. This environmental dimension of SQM is also linked to people issues such as culture, ethics, social justice etc. The purpose of this study is to develop an SQM framework for the higher education sector with particular reference to developing Arabic countries, such as Libya.

In the task bar below you can find eight sheets - LE, PS, CI, PF, CF, PM, TR and KR. Each sheet presents a short set of questions on Critical Success Factor for Sustainable Quality Management in Higher Education. A brief description of each factor is presented at the top of each sheet.

Please select your response by typing [X] in the appropriate box. You can also type your comments in the box provided at the end of each sheet. Completing the questionnaire will take around half an hour depending how many comments you wish to make.

Please base your response on how you feel a given sub - criteria is implemented in the most recent Higher Education Institution that you have been involved with in your home country.

Many Thanks.

Mabrouka Khoja

please open work sheet LE below

NB: the file for Appendix C is available at:

http://www.mediafire.com/file/2rlxol4h3nxwqk2/Appendix_D.questionnaire_Survey_Study.xls**.**

The reader of this thesis can down load by clicking on: Appendix D: Questionnaire Survey Study**.**

Appendix E: The Questionnaires

Appendix E. The Questionnaire.

Dear Respondent,

Dear Respondent,

My name is .....From De-Montfort University and I am conducting this questionnaire as a part of my PhD's thesis into "Sustainable Quality Management in Libyan Higher Education System".

The main aim of this study is to develop and evaluate SQM framework in Libya Higher Education System.

Sustainable Quality Management (SQM) is the application of sustainable development principles to quality management. It is the development of a quality framework, which incorporates the sustainable use of natural resources and does not compromise their availability to future generations. This environmental dimension of SQM is also linked to people issues such as culture, ethics, social commitment etc. The purpose of this study is to develop an SQM framework for the higher education sector with particular reference to developing Arab countries, such as Libya. The following questions relate to:

Leadership, Policy and Strategy, Continuous Improvement, People Focus/ Employee Participation, Customer Focus/ Stakeholder Approach, Process Management, Training, Key Results.

Based on the performance of your organization / institution, ***Please select your response by circling the number that best represents how you feel your organization performs on the scale provided.***

"1" represents your strong disagreement and "5"represents your strong agreement with the question.

Many Thanks.

Mabrouka Khoja

Tel: 07412036348 *Email: mkhooja@yahoo.com*

Researcher Signature..... *Participant Signature.....*

Date: / / *Date: / /*

Section 1: General Information

(Please, tick in the appropriate box)

1.1 Age

20 - 29 | *30 - 39* | *40 -49* | *50 - 59* | *Over 59*

1.2 Gender

Male *Female*

2. Qualification

Master degree *Doctoral degree* *other (Please specify)*

3. Your Country: | *Libya* | *other (Please specify)*

4. Place of your work: | *Tripoli City* | *Gharyan City*

A. LEADERSHIP

1- Leadership involvement in the development of a strategic statement about the purpose, direction and culture of the organization is high

Strongly disagree 1 2 3 4 5 strongly agree

2- Leadership involvement with customers, suppliers and society, towards promoting partnerships & improvements is high

Strongly disagree 1 2 3 4 5 strongly agree

3- Senior management implements quality management systems that improve organizational performance

Strongly disagree 1 2 3 4 5 strongly agree

4- The leadership has shown a high level of commitment to continuous improvement

Strongly disagree 1 2 3 4 5 strongly agree

5- The extent of the leadership commitment to quality training of stakeholders in order to improve their awareness on quality is high

Strongly disagree 1 2 3 4 5 strongly agree

6- Leadership awareness of natural resources and biodiversity s high

Strongly disagree 1 2 3 4 5 strongly agree

7- Leadership awareness of social and ethical justice is high

Strongly disagree 1 2 3 4 5 strongly agree

8- Managers' ability to make sound and timely decisions, based on information, experience and impact is high

Strongly disagree 1 2 3 4 5 strongly agree

9- The ability of leadership to inspire people towards a culture of involvement in, and ownership of, high quality education is high

Strongly disagree 1 2 3 4 5 strongly agree

Do you wish to comment on leadership and Sustainable quality management (SQM)in your organization?

B. POLICY and STRATEGY

1- Quality policy and strategy is only understood at senior levels of the organization

Strongly disagree 1 2 3 4 5 Strongly disagree

2- Performance evaluation of staff members is not based on quality

Strongly disagree 1 2 3 4 5 strongly disagree

3- Planning for quality is considered to be important

Strongly disagree 1 2 3 4 5 strongly disagree

4- The organization evaluates quality mainly through formal inspection of employees work

Strongly disagree 1 2 3 4 5 strongly disagree

5- The organization recognizes the value of environmental and ethical issues in financial processes

Strongly disagree 1 2 3 4 5 strongly disagree

6- There is transparency in the organizational processes

Strongly disagree 1 2 3 4 5 strongly disagree

7- There is significant promotion of local culture in the institution's functions

Strongly disagree 1 2 3 4 5 strongly disagree

8- The institution strongly promotes the efficient use of natural resources

Strongly disagree 1 2 3 4 5 strongly disagree

9- The institution strongly promotes innovation in its research, teaching and administration

Strongly disagree 1 2 3 4 5 strongly disagree

10- The organization Includes stakeholders' needs and expectations in its strategy

Strongly disagree 1 2 3 4 5 strongly disagree

11- Performance is clearly related to relevant benchmarks

Strongly disagree 1 2 3 4 5 strongly disagree

12- Individual and team objectives are aligned with the organization's strategic goals

Strongly disagree 1 2 3 4 5 strongly disagree

13- Staff awareness of the relevance of the organization's goals to their activity is high

Strongly disagree 1 2 3 4 5 strongly disagree

14- The organization has a strong commitment to the local population

Strongly disagree 1 2 3 4 5 strongly disagree

15- The organization has a strong commitment to global resources, the environment and conservation

Strongly disagree 1 2 3 4 5 strongly disagree

Do you wish to comment on policy and strategy and sustainable quality management (SQM) in your organization?

C. CONTINUOUS IMPROVEMENT

1- Regular feedback about quality is gathered from all stakeholders of the institution

Strongly disagree 1 2 3 4 5 strongly agree

2- Investment in human resources is considered important by the organization

Strongly disagree 1 2 3 4 5 strongly agree

3- Creativity and innovation are considered important by the organization

Strongly disagree 1 2 3 4 5 strongly agree

4- The institution has good systems for continuous improvement

Strongly disagree 1 2 3 4 5 strongly agree

5- Academic curricula of the institution are continuously improved

Strongly disagree 1 2 3 4 5 strongly agree

6- Educational outcomes are continuously reviewed

Strongly disagree 1 2 3 4 5 strongly agree

7- Recycling waste and neutralizing harmful materials on campus is considered important by the organization

Strongly disagree 1 2 3 4 5 strongly agree

8- Employees are involved in the continuous review of organizational processes

Strongly disagree 1 2 3 4 5 strongly agree

9- Physical assets such as buildings, equipment, materials and stocks are continuously improved

Strongly disagree 1 2 3 4 5 strongly agree

10- The continuous promotion of biodiversity and environmental conservation is considered important

Strongly disagree 1 2 3 4 5 strongly agree

11- There are clear procedures for identifying and evaluating emerging environmental technologies

Strongly disagree 1 2 3 4 5 strongly agree

Do you wish to comment on continuous improvement and sustainable quality management (SQM) in your organization?

D. PEOPLE FOCUS/ EMPLOYEE PARTICIPATION

1- The involvement of stakeholders (Student, Staff, Parents, Society) is important to the institution

Strongly disagree 1 2 3 4 5 strongly agree

2- Feedback on quality related matters is communicated to all staff and students

Strongly disagree 1 2 3 4 5 strongly agree

3- Quality awareness is effectively implemented among staff and students

Strongly disagree 1 2 3 4 5 strongly agree

4- The role of academic supervisors in quality is considered important

Strongly disagree 1 2 3 4 5 strongly agree

5- The institution provides a healthy and safe working environment to staff and students

Strongly disagree 1 2 3 4 5 strongly agree

6- The institution encourages learning and innovation at all levels

Strongly disagree 1 2 3 4 5 strongly agree

7- The institution has effectively implemented a system that provides social justice to all stakeholders

Strongly disagree 1 2 3 4 5 strongly agree

8- Stakeholder engagement is linked to the strategic plans of the organization

Strongly disagree 1 2 3 4 5 strongly agree

9- Individual goals and training are linked to the goals of the institution

Strongly disagree 1 2 3 4 5 strongly agree

10- Individual and team contributions to the organization's success are recognized, valued and rewarded

Strongly disagree 1 2 3 4 5 strongly agree

11- Accurate and adequate information is provided to all staff

Strongly disagree 1 2 3 4 5 strongly agree

12- Feedback is collected by the institution about its activities from external stakeholders

Strongly disagree 1 2 3 4 5 strongly agree

13- The organization's contribution to the community is considered important

Strongly disagree 1 2 3 4 5 strongly agree

14- Formal feedback is collected from staff and students

Strongly disagree 1 2 3 4 5 strongly agree

15- Data about satisfaction and morale is collected

Strongly disagree 1 2 3 4 5 strongly agree

16- There are clear mechanisms for groups with similar roles to meet and discuss quality issues

Strongly disagree 1 2 3 4 5 strongly agree

17- The organization has a clear focus on the continuous personal development of its employees.

Strongly disagree 1 2 3 4 5 strongly agree

Do you wish to comment on people focus and sustainable quality management (SQM) in your organization?

E. CUSTOMER FOCUS/STAKEHOLDER APPROACH

1- There is effective planning of quality that is based on student requirements and feedback

Strongly disagree 1 2 3 4 5 strongly agree

2- Involvement of staff and students in the wider community is considered important by the organization

Strongly disagree 1 2 3 4 5 strongly agree

3- Monitoring, understanding and improving the perception of the organization by its members is considered important

Strongly disagree 1 2 3 4 5 strongly agree

4- Performance data is effectively used to improve the educational services and output

Strongly disagree 1 2 3 4 5 strongly agree

5- The management of the institution considers students as customers

Strongly disagree 1 2 3 4 5 strongly agree

Do you wish to comment on customer focus and sustainable quality management (SQM)in your organization?

F. PROCESS MANAGEMENT

1- The institution has implemented a program for identifying and addressing barriers across various departments

Strongly disagree 1 2 3 4 5 strongly agree

2- There is a clear and effective process for reviewing educational standards

Strongly disagree 1 2 3 4 5 strongly agree

3- There is a clear and effective process for monitoring and maintaining equipment and facilities

Strongly disagree 1 2 3 4 5 strongly agree

4- The teaching and research programs of the institution are stable (not subject to constant change)

Strongly disagree 1 2 3 4 5 strongly agree

H. KEY RESULTS

I.

1- Key financial *and non- financial* outcomes are compared with direct competitors or equivalent organizations

Strongly disagree 1 2 3 4 5 strongly agree

2- The performance of different departments and functions are taken into account when considering overall organizational performance.

Strongly disagree 1 2 3 4 5 strongly agree

3- The performance of activities (or processes) that directly contribute to educational output are effectively measured

Strongly disagree 1 2 3 4 5 strongly agree

4- Educational support and administration activities (e.g. I.T. planning, security etc.) are improving

Strongly disagree 1 2 3 4 5 strongly agree

5- The environmental performance of the organization is improving steadily and is comparable with other similar organizations

Strongly disagree 1 2 3 4 5 strongly agree

Do you wish to comment on key results and sustainable quality management(SQM) in your organization?

Appendix F: Consent Form

Research Questionnaire / Interview Consent Form

For the PhD Research Project titled

Sustainable Quality Management in Higher Education: Evaluation of Deming and EFQM models in Libyan Universities

Student Name: Mabrouka khoja

I, _____(participant's name), understand that I am being asked to participate in a Questionnaire activity that forms part of Ms. Mabrouka Khoja's PhD research at the Institute of Energy and Sustainable Development, DE Montfort University, UK. It is my understanding that this Questionnaire has been designed to gather information about Quality Management and Sustainable Development

I understand that the questionnaire will be conducted by email and will take less than one hour of my time to complete.

I wish to state that my participation in this project is completely voluntary and that I can freely decline to participate, without any consequence, at any time. I understand that any information provided will be kept confidential, used only for the purpose completing the research project and will not be used in any way that can identify me. All responses will be stored in a secured environment. At my request the researcher will destroy all information collected from me.

I have read the information above. By signing (typing) below and returning this form with my questionnaire I am consenting to participate in this questionnaire

Participant name _____
Signature _____
Date _____

Please keep a copy of this consent form for your records. If you have other questions concerning your participation in this project, please contact me at:
Telephone number: 07412036348 E-mail: mkhooja@yahoo.com
Thank you for agreeing to participate in my project.

Mabrouka Khoja
PhD Student
Institute of Energy and Sustainable Development
DeMontfort University
Leicester, UK

Appendix G: Details submitted for Ethical Approval of Mabrouka Khoja's PhD research project.

The information required for the project requires ethical approval as it involves data collection through questionnaire and interviews at two university sites in Libya. In this context the following information are submitted for ethical approval.

1- Information about participation

2- Arrangements for collecting information.

3- Consent form.

1. Information about participation:

Phase 1:

- Exploratory interviews twenty academic and administrative staff in Al – Tripoli University and Gharyan University.
- Semi – structured interviews with ten employees of the Libyan Quality Centre in Tripoli.
- Preliminary interviews with three government officials (Libyan Higher Education)

Phase 2:

- Administered questionnaire with approximately 100 – 150 stakeholders in two universities.
- Follow up interviews with fourteen senior administrators' academics and policy (Higher Education Officials).
- Model evaluation questionnaire to 20 – 40 stakeholders in two universities.

Arrangement for collecting:

Phase 1:

- Prospective participants were contacted by email and or telephone the project was outlined to them and where appropriate a meeting arranged.
- Phase 2:
- Existing contacts will be used for initial questionnaire response; snowballing approach will be adopted to reach the required sample size.
- Telephone, email and Skype will be used to organise the follow up interviews.

3. Consent form: A consent form designed and distributed to the participants before gathering information is attached.

Appendix H: Semi- Structured Interview.

Interview Date ……

Name of Organization: …….

Name of Participant: …….

Phone: ……..

Email: ……..

Position \ Title: ……

..

Introduction:

Good Morning \ Afternoon. My name is …….From De-Montfort University and I am conducting this interview as a part of my PhD's thesis into "Sustainable Quality Management in Higher Education.

This interview is completely voluntary and confidential if at any time you would rather not answer a question please say so. The information will be used for my thesis but I will not include any personal details about you.

The interview should be taking about 30 – 45 minutes and with your permission will be taped.

With your agreement, I will proceed with the interview.

Q1. What does the word “Quality” means to you?

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Q2. What does “Quality in Higher Education” mean to you?

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Q3. What does “Quality in Higher Education” mean to your organization?

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Q4. How is quality evaluated in your institution? (Procedures, measures, effectiveness)

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Q5. What does “Sustainable Development” mean to you?

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Q6. What does “Sustainable Development” mean to your organization?

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Q7. How is sustainable development evaluated in your institution? (Procedures, measures, effectiveness

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Q8 .Do you think that quality and sustainable development in higher education are linked?

How?

Why?

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Q9 .Is it important that they are linked? Why?

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Q10. (If the environment is not mentioned above – you could ask) Do you feel that Protecting the natural environment is a significant factor in how your organization performs? (Why, how (is it) could it be measured, improved?).

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Q11. Can you please state three critical factors of enhancing higher education quality in order of importance?

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Q12. Can you please state three critical factors for sustaining education quality in order of importance?

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Q13. Please name a few faculties of your university that are doing better than others in enhancing education quality? For what reasons these faculties are doing better?

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Q14. Who have better knowledge about education quality young / middle age or seniors' staff members of your university? Reasons?

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Q15. Which staff members have better knowledge in education quality matters? Staff working in Tripoli or Gharyan? Reasons?

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Q16. Do you think inspection is important in enhancing education quality? Reasons? Is inspection practiced in your university?

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Q17. Does your institution includes stakeholder needs in it's the policies? If not why?

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Q18. Is your institution committed to local community? In what ways? If not what should be done?

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Q19. Is bio - diversity and natural resources are properly conserved in your institution? If not why? What ways you recommend for conservation?

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Q20. Is your institution measures its performance and compares with other institutions? If yes in what ways? If not why?

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Q21. Is your organisation measures environmental performance? In which ways environmental performance is measured? If not for what reasons?

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Q22. Can you identify some factors that are drivers or barriers to education quality improvement at your institution?

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Q23. How your organisation does reviews education standards? Continuous reviews are done?

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Q24. Does the institution gather feedback from staff and students, parents and community? How this feedback is processed? If not why?

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Q25. In Libya, which university stands high on education quality? Reasons?

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Q26. Can you state a few reasons for Libyan higher education standing on low in quality?

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Q27. Do you think the Quality Centre and Education Secretariat are doing well in enhancing quality? If not reasons? In what ways they can contribute for further improvement?

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Q28. Do you think your institution is getting the results for the investments made in education? Can you explain more?

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Q29. What kind of rewards systems practiced for staff and students in your university?

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Q30. Are you aware if benchmarking, statistical quality controls and quality circles? Are these practiced in your university?

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Q31. Can you comment on social justice and transparency in your institution? Can you compare Tripoli and Gharyan universities on these?

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Q32. Can you comment on health and safety issues of your institution? Are there clear mechanisms for health and safety in your institution?

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Q33. Are the policies and processes of your institution are in accordance with your culture? If not what do you like to suggest?

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Q34. What can be done to enhance creativity and innovation in your institution?

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Q35. What do you suggest for continuously improving curriculum of the universities?

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Q36. Is your institution disposing harmful wastes safely? (for example laboratory wastes) Please comment and suggest.

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Q37. If you compare Tripoli and Gharyan universities on education quality, which is performing better and why? Can you compare quality training in these universities?

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Q38. Can you comment in general about the leadership in Libyan higher education? Can you identify some drivers and barriers of higher education leadership in Libya?

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Q39. What is your opinion on human resources investment in Libyan higher education?

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Q40. What is your comparison of community activities in Tripoli vs Gharyan universities?

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Q41. TQM advocates a customer oriented approach. What is your opinion for considering students as customers?

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Q42. What activities are going on in your university towards a green campus and environmental conservation? Comments?

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Q43. In what way your institution has mechanisms for employee and people participation? Any comments? Can you compare Tripoli and Gharyan universities on these?

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.....

Telephone number: 07503488025 email: mkhooja@yahoo.com

Thank you for agreeing to participate in my project.

Mabrouka Khoja

PhD Student

Institute of Energy and Sustainable Development

DeMontfort University- Leicester, UK

Signature: ..... Date: \ \ \

Appendix I: Links to Quality Models in the study Questionnaire

(This Appendix can also be considered for further development into a Chapter 4 and Sections 4.1 to 4.9)

C.1 Introduction

The questionnaire prepared for the study is based on a combined approach involving past works on sustainability, PDSA and EFQM models. For the case of EFQM model the latest version was used (EFQM, 2010; Appendix K). In this process the PDSA and sustainability based questions are first listed in the order of CSFs chosen for the study (Appendix J). For example 1a, 1b … series are related to the CSF on leadership and 2a, 2b … are related to the CSF Policy and Strategy and so on. A list of references used for deriving these questions were presented in the earlier version of the PDSA Excel sheet analysis on TQM sustainability; this was based on a listing of Quality Action Programmes (QAPs).

The above-mentioned listing was checked for one – to - one correspondence with EFQM 2010 that divides the questions in nine main criteria and 49 sub – criteria.

Two CSFs, leadership and policy and strategy are common to both PDSA and EFQM models. Other headings on CSFs in PDSA and main criteria of EFQM varied considerably. However some parallels can be drawn in this variation. For example employee participation in PDSA can be closely linked to "People" criteria of EFQM and "Customer focus" in PDSA is almost similar to "Customer results" in EFQM.

The sequential numbers of the final list of questions drafted will change based on the addition and removal questions listed in Appendix J. In addition elaborate expressions of the sub – criteria have been summarised in the questionnaire to the extent possible, based on the pilot study conducted (Section 5.9.3).

C.2 Exploring the Links

The relational positions of the questions explored between Sustainability, PDSA and EFQM models can be broadly classified into five types as given below:

Link Type 1: Questions primarily based on sustainability criteria derived from TBL / Five Capital models (Section 2.5). These provide general terms of sustainability but can be considered relevant to any organisational framework (For example " maximising use of innovation and minimizing use of natural resources" depicted by Five Capital Model (Section 2.5.2).

Link Type 2: Questions based on sustainability criteria in the existing frameworks of PDSA / EFQM that is also related to QM (For example "encouraging creativity and innovation" in PDSA and "use of alternative technologies for environment" outlined in EFQM 4.4 in).

Link Type 3: Questions of PDSA and EFQM, which are almost similar; this implies that in the study questionnaire only a combined question is required to be presented to avoid repetition.

Link Type 4: Questions of PDSA and EFQM, which are either partially linked to each other by the same sub - criteria or are mutually exclusive. This kind of exclusion occurs when a question addresses the same Quality Action Programme (QAP) with a different perspective or it is coined with a view to integrate with another QAP. In this case the questions of the study need to be sub - divided into two or more questions incorporating all the sub – criteria of the questions. An example of this type of link is the PDSA Question (2a) that suggests the need for an understanding of quality policy and strategy at all levels of the staff of the organization. This is partially related to EFQM 2.4 that requires aligning the strategic goals of the organization with that of the staff (Section 4.4).

Link Type 5: One of the questions (either PDSA or EFQM) is a sub – criteria of the other. For example the EFQM question 1.3 in Appendix K:
"Involvement of leadership with customers, suppliers and representative of society"

Can be considered as a sub – set of the PDSA question (1b) in Appendix J:
"Involvement of leadership in quality"

In this case a decision is required to either use only the main criteria question or to use the entire sub – criteria questions (discarding the main criteria).

Link Type 6: There are questions specific to higher education which are derived either from QM or sustainability models (for example "continuous improvement of curricula"; Section 4.5).

In the following Sections these links are explored and discussed with reference to the study questionnaire.

C.3 Leadership

The PDSA question (1a) deals with "leadership responsibility "towards quality; in EFQM 1.1 and 1.3 "involvement" and "participation" of leadership are highlighted. In addition to this EFQM also discusses leadership through other sub – criteria such as: (a) strategy vision and direction of the organisation and (b) with customers, suppliers and society towards creation of partnerships. This is considered Link Type 5 and therefore these two questions are to be added to the study questionnaire (1f and 1g).
The PDSA question (1c) pertains to leadership commitment for continuous improvement in the organisation. In EFQM leadership criteria questions 1.2, 1.3 and 1.4 are related to improvement that highlights:

1. Senior management implementing a management systems to consistently improve results (EFQM 1.2)

2. Managers meeting customers, suppliers and society towards improvement initiatives (EFQM 1.3).
3. Leaders creating a culture of involvement, ownership and empowerment at all levels, towards improvement (EFQM 1.4)

The discussions presented in Section 4.5 point to the fact that continuous improvement need to take place in all activities of the organization. Therefore EFQM dividing the questions in different components of quality can be considered as leadership's relationship with various components of the organization.

The PDSA question (1d) concerns about leadership commitment to quality training for all stakeholders with a view to enhance the awareness about quality. A direct question on this aspect is unavailable in EFQM; however there are questions relating to training in EFQM 3.1, 3.2, 7.1 and 7.4 under "People" and "People Results" criteria. These questions lay emphasis on the training provided to the people with reference to policy and organizational goals, which are indirectly linked to quality. This is in contrast to the focus of the question (1d), which is quality awareness among all stakeholders.

The PDSA question (1e) is a Link Type 1 question that was derived from Five Capital model. This criteria states that the leadership of any organization should be aware of natural resources, social and ethical justice to all in the organization and biodiversity (Section 1.2). In EFQM question 4.4 (Partnerships and Resources), question 7.1 (People results) and question 8.2 (Society results) depict natural resources and environment in various ways to the organization. However an exclusive question linking leadership with environment is unavailable in EFQM leadership criteria.

Questions (1f) to (1j) are Link Type 4 questions derived from EFQM and will be incorporated in the study questionnaire.

C.4 Policy and Strategy

The PDSA Question (2a) suggests the need for an understanding of quality policy and strategy at all levels of the organization. This is partially related to EFQM 2.4 and 2.5 that requires aligning the strategic goals of the organization with that of the staff. In addition the staff is also required to synchronise plans of the organisation to their own plan; this aspect is also linked to PDSA question (2c) that asks in general about importance given to quality plan. The question on leaders to have a strategic plan

outlined in (1f) is based on EFQM 1.1, is also related to this question. These questions are considered Link Type 4 and based on this discussion the EFQM questions 2.4 and 2.5 are included as (2l) and (2m) in the study questionnaire.

The PDSA question (2b) requires performance evaluation of staff members based on quality. In EFQM a partial link to this question can be found in 5.4, asks about comparison of service delivery performance with relevant benchmarks.

The "P" in PDSA stands for planning and the importance of it was discussed in Section 2.3. The question (2c) stresses about this aspect that pertains to the whole organisation; in this context EFQM 2.5 about integration of the plan of the organisation with individual plan can be considered as a partial link of Link Type 4.

Question (2d) is based on Deming's third principle that discourages inspection for quality (Section 4.7). Questions 2(e) to (2h) are Link Type 1 questions derived from Five Capital model (Section 4.7.2). Link Type 4 questions (2i) to (2m) were derived from EFQM model.

C.5 Continuous Improvement

EFQM has not included separate main criteria for the CSF on Continuous Improvement. However it is noted that many sub –criteria on continuous improvement related questions are distributed through EFQM main criteria People, Partnerships and Resources, Customer Results, People Results and Key performance results; these are summarised below:

1. EFQM question 3.3. Pertains to continuous improvement and reviews conducted by employees at all levels towards effectiveness and efficiency of processes. This can be considered as a component of PDSA that advocates reviews and improvements in a cyclic approach.
2. EFQM 4.3 on continuous improvement of physical assets towards organisation and community; the community orientation of this question is also linked to sustainability.
3. EFQM 6.1 and 6.2 deal with improving customer satisfaction on products and services.
4. EFQM 6.3 and 6.4 are on improvements due to internal changes and EFQM 6.7 is about improvements due to surveys.
5. EFQM 7.3 on improving trends in people satisfaction

6. EFQM 9.1 on improvement in key results
7. EFQM 9.7 on improving trend in support services.

PDSA (3a) and EFQM 3.3 are almost similar that is concerned about the importance given to employee feedback. In fact Deming's principle that all the employees are to be involved in the quality movement is also stressed in this EFQM question that asks about all employees' involvement in continuous reviewing the processes of the organisation. The specificity of the EFQM in process orientation is noted as a variation from PDSA structure in this case. Questions concerning encouraging creativity and innovation have common importance in both the systems (3c and EFQM 3.5). In fact "Innovation and Learning" is considered as a cyclic process presented in the EFQM flow diagram (Section4.4; Figure 2.3).

Process response to continuous improvement is focused in question (3d) that is partially linked to EFQM 5.5 that asks about continuous process monitoring on customer perceptions.

Questions (3e) and (3f) are Link Type 6 questions specifically derived for higher education. These are linked particularly to Libyan situation as curriculum development is lagging behind in this case (Section 5.5).

It requires continuous monitoring and neutralization of harmful chemicals and other similar materials used for experiments in higher education (Section 5.8). This is particularly relevant to biological (including medical agricultural etc.), chemical and other wastes generated. This aspect is stressed by the twelve features system of the Five Capital model and a Link Type 1question pertaining to this is added in (3g). Apart from the experimental studies this point is also relevant to waste disposal at educational campuses, where large number of students reside and consume food. Recent actions on this issue based on UNEP and UNDP initiatives have led to sustainable development programs in many UK universities including the DMU (Section 4.9). A similar environmentally based question is presented in EFQM 8.2 on Society results. This is considered a Link Type 4 question and combined question is presented for this case. Another question presented in (3j) on environmental biodiversity is also partially linked to EFQM 8.2. Another Link Type 4 question is EFQM 4.4 that relates to alternative technologies for environmental conservation.

C.6 Employee Participation

Questions (4a) and (4b) pertain to use of methods such as Quality Circles that requires a group of employees with similar tasks meet with the management on a regular basis. EFQM 1.3 asks if leaders are regularly meeting with various stakeholders of the organization towards improvement. Hence questions (4a) and (4b) can be considered as sub – set of EFQM 4.3 as grouped under Link Type 5; the main criteria question is proposed for inclusion in the study questionnaire.

Feedback to employees on quality matters of the organization is considered important in past works (Section 5.6). The question (4d) and EFQM 3.4 are almost similar in this case and are classified under Link Type 3.

Discussions presented in Section 4.6 Point to the fact that the education leadership in Libya proposes to implement quality awareness training programs as a first step. The PDSA questions (4e) and (4f) stress on this point. These are linked to Leadership promoting quality training discussed in Section 4.3 and question (1d).

Four questions added from (4g) to (4j) are Link Type 1 questions pertaining to provision of high standard of health to all, scope for learning and innovation, availability of social justice to all and safe working environment; these are derived from the Five Capital Model's 12 feature system. It is noted here that "learning and innovation" is a common sub – criteria adopted in all three models i.e. sustainability, PDSA and EFQM and also has links to continuous improvement as discussed in Section 4.5. Questions (4k) to (4n) questions added from EFQM based on the previously presented discussions in this Section.

Four questions derived from EFQM on society results are proposed for inclusion in this Section; these are EFQM 8.2, 8.3, 8.4 and 8.5 on feedback from society, community activities, improving trends and comparable with other businesses; These are added as (4o) to (4q) in the study questionnaire.

C.7 Customer Focus

The questions (5a) and (5b) enquire about requirements and feedback of students and belong to Link Type 6 category; these are derived for higher education based on the parallel that students are customers of higher education (Section 5.7.2). These are

related to EFQM 5.2 that deals with methods for understanding customer's perception, needs, and expectations and EFQM 5.5 that recommends continuous monitoring and review of experiences and perceptions of the customers. In addition, EFQM 5.4 requires comparing products and service delivery performance with relevant benchmarks to maximise the value generated for customers. The need for leadership to meet customers was discussed towards partnerships and an improvement was discussed in Section C.1. The involvement of students in community activities is favoured for sustainable development of campuses and in the Five Capital Model and this aspect is highlighted in question (5c).

Other Link Type 4 questions to be included in the study questionnaire based on EFQM on customer results are:

EFQM 6.1: Regular survey of customers to determine their satisfaction on products and services.

EFQM 6.2: Is 6.1 showing an improving trend or sustained high level of performance?

EFQM 6.3 that advocates monitoring, understanding and improving performance of processes that impact customer perception.

EFQM 6.4: Is 6.3 showing an improving trend and achieve targets?

EFQM 6.5: Measures relating to customer satisfaction and loyalty are comparable with / better than those of industry average or best – in class organizations.

EFQM 6.6 Are the customer results segmented to show the perceptions of the various groups and types of customers (including lost or potential customers).

These questions are related to themes on sustainability of improvements, processes and comparison with other industries.

C.8 Process Management

It was discussed in Section 4.8 that processes can remove barriers enabling horizontal coordination across departments - an issue that is prominently highlighted for the case of higher education. Question (6a) pertains to this aspect and is almost parallel to EFQM 5.1 indicating a case for Link Type 3. The Link Type 6 question (6b) requires

measuring standards based on sampling that is based on PDSA procedures (Section 2.3). Question (6c) is based on Deming's statistical control charts. Following this, three Link Type 6 PDSA questions are included on equipment, stability of academic and research programs and automation of process. The question (6g) has been included on process identification for natural resources and environment based on the Five Capital Model (Section 4.7.2). A question on process performance indicators to strategies is highlighted in EFQM 6.3, that is added as (6h) in the study questionnaire.

C.9 Training

As discussed in Section 5.9 quality training is considered as an important first step by the Libyan education leadership. Questions (7a) to (7d) pertain to various training related sub – criteria of PDSA, including faculty, quality circles and TQM. The EFQM approach to training is listed under "People" and "People Results" criteria. These include EFQM 3.1 on plans for training, EFQM3.2 on aligning training to organisation needs, EFQM 7.1 on training feedback and EFQM 7.4 people satisfaction on training. These questions have only a partial link to training. The questions under "People" criteria have been included under (4k) and (4j) on Employee Participation and EFQM 7.1 and 7.4 have been included under this Section.

C.10 Key results

The questions presented in this Section are derived from EFQM. It is proposed to include these in a separate section.

C.10 Summary

In this Appendix a discussion on various types of links between the study questions were presented. These discussions can be used for testing question responses and further statistical analysis of the study. Based on the study it is proposed that replacing "employee" with "people" and "customer" with "stakeholder" can broaden the sub – headings of the study.

Appendix J: All Questions and Links Models Survey Questionnaire of Quality and Sustainability

This Appendix provides a summary of all questions derived from various models chosen for the study (i. e. sustainability, PDSA and EFQM models). Based on the links remarks discussed in Appendix I, a particular question is proposed to be included or modified or deleted from the final study questionnaire. This is also summarised under "Links & Remarks" columns of each Table.

1. Leadership

No.	Question	Based on past work	Links & Remarks
1a	Top leadership and department heads' responsibility	PDSA	Link Type 4; Consider deletion because more specific questions added in (2b)
1b	Involvement and participation of top leadership	PDSA	In EFQM leadership involvement is specifically discussed under three sub – criteria a. Questions 1.1 that discusses involvement in strategy vision and direction of the organisation b. Question 1.3 involvements with customers, suppliers and society towards creation of partnerships. Link Type 5; This question has been divided into two questions 1(f) and 1g).
1c	Leadership commitment to continuous improvement that includes the cycle of reviewing every process and implementation of action plans	PDSA	In EFQM 1-2, 1-3, 1-4 deal with the word improvement. 1-2 implementation of management systems to improve results 1-3 Are Managers meeting customers, suppliers and society towards improvement initiatives? 1-4 Leaders Create a culture of involvement, ownership and empowerment at all levels, towards improvement? Link Type 5; Included

1d	The extent of the leadership commitment to quality training of the concerned stakeholders in order to improve their awareness on quality	PDSA	In EFQM training is emphasised under people with the emphasis of policy and strategy linked to it. Although policy and strategy has strong linkages to leadership, it requires commitment from leadership to initiate all stakeholders' training and awareness of SQM. Link Type 4; Included
1e	The requirement of leadership being aware of natural resources, social and ethical justice and biodiversity	Five Capital	These are sub – criteria derived from Five capital model. Link Type 1; Included
1f	Involvement in generating and communicating a strategic statement for the purpose, direction and culture of the organisation	EFQM	Follow up on the question (1b) Included based on EFQM 1-1
1g	Involvement with customers, suppliers and representative of society, towards promoting partnerships & improvements	EFQM	Follow up on the question (1b) Included based on EFQM 1-3
1h	Is the senior management implementing a system that consistently improve results	EFQM	Included Based on EFQM 1-2
1i	Leadership inspire people towards a culture of involvement and ownership	EFQM	Included Based on EFQM 1.4
1j	Managers' ability to make sound and timely decisions, based on available information, previous experience and	EFQM	Included based on EFQM 1-5

	consideration of the impact of their decisions		

2. Policy and strategy

No	Question	Based on past work	Remarks & Links
2a	Understanding quality policy and strategy at various levels of the organisation	PDSA	This is related to 2.5 of EFQM that requires the staff to list the plans of the organisation to their own plan. This is also partially linked to (1f) that requires leaders to have a strategic plan; this is based on EFQM 1.1 Link Type 4; Included
2b	The performance evaluation of staff members is based on quality	TQM	In EFQM a more general question on this aspect is noted; i.e. evaluation of performance trends and core competencies for understanding the current and future potential of the organisation EFQM 2.2 Link Type 5: Included
2c	The importance given to a quality plan	PDSA	The "P" in PDSA stands for planning an important component of the whole cycle. The planning implied here is the plan of the whole organisation; But EFQM in 2.5 highlights integration of the plan of the organisation with individual plan to achieve them.
2d	Discouraging quality based on inspection	PDSA	Link Type 4; Included
2e	Sustainable development requires that the Triple Bottom Line (Economics / Ethics and Environment) be included in financial process; The level of importance given to this aspect	TBL	Link Type 1; Included

2f	Promotion of transparency in the institution's functions	Five capital	Link Type 1; Included
2g	Promotion of local culture in the institution's functions	Five Capital	Link Type 1; Included
2h	Minimise use of natural resources, maximize use of innovation.	Five Capital	Link Type 1; Included
2i	Incorporating stakeholders' need and expectations in the strategy and remaining constantly alert to any changes?	EFQM	Based on EFQM 2.1 Link Type 4; Included
2j	Analysing operational performance trends and core competencies to understand current and potential organisational capabilities	EFQM	Based on EFQM 2.2 Link Type 4; Included
2k	Comparing performance with relevant benchmarks to understand relative strengths and weaknesses	EFQM	Based on EFQM 2.3 Link Type 4; Included
2l	Aligning individual and team objectives with the organisation's strategic goals and ensure that they are empowered to maximise their contribution?	EFQM	Based on EFQM 2.4 Link Type 4; Included
2m	Could most staff list the organisation's goals relevant to their activity, and are they familiar with the plans to achieve them in their own areas?	EFQM	Based on EFQM 2.5 Link Type 4; Included
2n	Can you demonstrate that your organisation has achieved results on preventing or reducing harm or nuisance to neighbours and the general environment, on conserving and protecting global resources (e.g. energy,	EFQM 8.2	Based on EFQM 8.2 Link Type 2; Combine / Modify

	recycling, waste)?		

3. Continuous Improvement

No	Question	Based on Past work	Links and Remarks
3a	Importance given to Employee suggestion through meetings, workshops etc.	PDSA	This is related to 3.3 of EFQM stressing on value of employee reviewing. Link Type 3; Consider deleting after including EFQM 3.3
3b	Improvement of Human Resources towards best practice	PDSA	Link Type 4; Included
3c	Encouraging creativity and innovation	PDSA	Linked to EFQM question 3.5 that asks for rewards to people improving the organisation. Innovation is a key element in the cycle of EFQM flow diagram Link Type 3; Consider deleting.
3d	Systems and process response to CI	PDSA	Links to EFQM 6.3 and 6.4 on internal processes Link Type 4; Included
3e	CI of curricula	PDSA	This is specific to HE; consider it a branch of CI that is specific to HE. This is point that was highlighted for the case of Libyan HE by UNESCO. Link Type 6; Included
3f	Constant review of educational outcomes	PDSA	Can be linked to: EFQM 7.3 on improving trends in people satisfaction EFQM 9.1 improvement in key results EFQM 9.5 on products and

			services Link Type 6; Included
3g	Recycling and neutralising harmful materials	Five capital	This is one of the 12 features of the Five Capital model. In HE this is relevant to biological (including medical agricultural etc.), chemical and other wastes generated. Apart from this is also relevant to waste disposal at campuses. Link Type 3; Use a combined question
3h	Process that involves all employees in continuously reviewing, improving and optimising the effectiveness and efficiency of their processes?	EFQM 3.3	Based on EFQM 3.3; In this case reviewing and improving can be considered as parallel issues to PDSA
3i	Are physical assets such as buildings, equipment, materials and stocks managed and continuously improved to the benefit of the organisation and of the community?	EFQM 4.3	Based on EFQM 4.3; Community orientation of this question is relates to sustainability. In the context of HE it can be said that both on the campus and off the campus communities can be considered to answer the question.
3j	Promotion of biodiversity	Five Capital	This is related to EFQM and 8.2 that discusses about environmental conservation; However biodiversity is considered a specific topic that deals with protection of the variety in organisations. Link Type 3; Use a combined question
3k	Is there a routine method for identifying and evaluating alternative and/ or emerging technologies in the light of their	Based on EFQM 4.4	Based on EFQM 4.4; This question is relevant in the

	impact on organisational performance and the environment?		context of sustainability. Link Type 4; Combine / Modify

4. Employee Participation

No	Question	Based on past work	Remarks & Links
4a	Implementation of quality circles or similar programs	PDSA	Linked to EFQM 4.3; Link Type 5 Delete the sub – set of questions
4b	Effectiveness of quality circles	PDSA	As above
4c	Employee responsibility to quality	PDSA	Link Type 5; Delete because more specific EFQM questions are added
4d	Feedback to employees on quality	PDSA	Linked to EFQM 3.4. Link Type 3; Can be combined
4e	Quality awareness among employees	PDSA	Link Type 4; Included
4f	Supervisor's participation in quality	PDSA	Link Type 4; Included
4g	Provision of high standard of health to all	Five Capital	Link Type 1; Included
4h	Scope for learning and innovation	Five Capital	Link Type 1; Included
4i	Availability of social justice to all	Five Capital	Link Type 1; Included
4j	Safe working environment	Five Capital	Link Type 1; Included

4k	Are the people plans derived from strategic plans?	EFQM	Based on EFQM 3.1 Link Type 4; Included
4l	Is there an appraisal process (which is respected for aligning an individual's goals and training with the organisation's needs)?	EFQM	Based on EFQM 3.2 Link Type 4; Included
4m	Are people's efforts in generating improvement and contributing to the organisation's success recognised, valued and rewarded?	EFQM	Based on EFQM 3.5 Link Type 4; Included
4n	Does your organisation ensure that people are provided with accurate and sufficient information to support them in effective and timely decision-making?	EFQM	Based on EFQM 4.5 Link Type 4; Included
4o	Is formal regular feedback collected (through questionnaires, interviews, focus groups...etc) of the perceptions of the society on various aspects of the organisation's reputation?	EFQM	Based on EFQM 8.1 Link Type 4; Modify
4p	Can you demonstrate that your organisation has achieved results on positively contributing to the community (education, charity, sports and leisure, leadership in professional matters)?	EFQM	Based on EFQM 8.3 Link Type 4; Modify
4q	Are the activities in the above areas showing a sustained high performance and achieved targets? Can the results be shown to be comparable with others in the locale, or business sector?	EFQM	Based on EFQM 8.4 and 8.5 Link Type 4; Combine

5. Customer Focus

No	Question	Based on past work	Remarks & Links
5a	Student requirements designed into quality	PDSA	Link Type 6; Included
5b	Promotion of student feedback	PDSA	Link Type 6; Included
5c	Activities on positive values and community development	Five Capital	Link Type 1; Included
5d	Regular survey of customers to determine their satisfaction with its products and service?	EFQM 6.1	Link Type 4; Included
5e	Is result of (5d) improving?	EFQM 6.2	Link Type 4; Included
5f	Monitor, understand and improve performance of processes that impact customer perception?	EFQM 6.3	Link Type 4; Included
5g	Is 5f showing improving trend?	EFQM 6.4	Link Type 4; Included
5h	Results of 5d and 5e are better than average industries	EFQM 6.5	Link Type 4; Included
5i	Customer results segmented to show the perceptions of the various groups and types of customers (including lost or potential customers)?	EFQM 6.6	Link Type 4; Included
5j	Can your organisation show that the results of surveys are always effectively used to improve the products or services it provides?	EFQM 6.7	Link Type 4; Included

6. Process Management

No	Question	Based on past study	Remarks & Links

6a	To what extent the processes are identified to cut barriers across departments?	PDSA / EFQM	Link Type 3; Use a combined question
6b	Reviewing education standards based on sampling	PDSA	Link Type 6; Included
6c	Use of statistical process control charts	PDSA	Link Type 4; Included
6d	Process orientation to Equipment / facilities maintenance	PDSA	Link Type 4; Included
6e	Stability of programmes (Academic / Research / Administration)	PDSA	Link Type 6; Included
6f	Automation of processes	PDSA	Link Type 4; Included
6g	Process identification for natural resources development and environmental conservation	Five Capital	Link Type 1; Included
6h	Have meaningful process performance indicators and outcomes measures (clearly linked to strategic goals)?	EFQM 5.3	Link Type 4; Included

7. Training

No	**Question**	**Based on past study**	**Remarks & Links**
7a	Advancing faculty qualifications	PDSA	Link Type 4; Included
7b	Training on statistical quality controls	PDSA	Link Type 4; Included
7c	Training on quality circles	PDSA	Link Type 4; Included
7d	Training on TQM	PDSA	Link Type 4; Included
7e	Is formal regular feedback collected (through questionnaires, interviews,	EFQM	Link Type 4; Modify

	focus groups..etc.) of the perceptions of the people on various aspects of the organisation such as, working environment, health, safety, communications, career prospects, pay, appraisal, recognition, training, and overall satisfaction?		
7f	Does the organisation regularly measure and evaluate indicators which predict trends or influence people satisfaction and morale (such as absenteeism, sickness, staff turnover, early leavers, levels, of training, internal promotions, accident levels, recognition levels, grievances)?	EFQM	Link Type 4; Modify

8. Key Results

All questions in this Section are added from EFQM.

No.	**Question**	**Remarks & Links**
8a	Do the results of your organisation's key financial and non-financial outcomes (e.g. profits, margins, volumes, market share, performance against budget, ...etc)show an improving trend?	Link Type 4; Modify
8b	Do these key financial and non-financial outcomes have results that are comparable with / better than	Link Type 4; Modify

	direct competitors or equivalent organisations?	
8c	Are these results segmented by the various parts of the business, markets, and / or products and service measured and known?	Link Type 4; Modify
8d	Is the performance of all activities (processes) that directly contribute to a product or service measured and known?	Link Type 4; Modify
8e	Are the result of these products and service activities showing an improving trend and achieved targets?	Link Type 4; Modify
8f	Are the results of these product and service activities compared with others and can they be shown to be comparable/ better?	Link Type 4; Modify
8g	Are the results of the support and administration activities (e.g. I.T. planning, legal, security, accounts) showing an improving trend and can they be shown to be	Link Type 4; Modify

	comparable/ better than other organisations?	

Appendix K: EFQM Questionnaire (2010) links to the study questionnaire

The numbers indicated in the last of column of the Tables in this Appendix are linked to overall questionnaire presented in Appendix I.

1- Leadership

Question	Link to Appendix I
1- Are all leaders involved and visible in generating and communicating a strategic statement for the purpose, direction and culture of the organisation (including its quality values and priorities)?	1f
2- Have the senior managers ensures the implementation of a management system that is effective in delivering consistent and improving results?	1h
3- Are all managers taking action to meet with customers, suppliers and representative of society, and be actively & appropriately involved in promoting partnerships and improvement initiatives with them?	1g
4- Do all leaders, by example and action, inspire people and create a culture of involvement, ownership empowerment and improvement at all levels?	1i
5- Are all managers demonstrating the ability to make sound and timely decisions, based on available information, previous experience and consideration of the impact of their decisions?	1j

2- Strategy

Question	Link to Appendix I
1- Does your organisation gather stakeholder's need and expectations for input to the development and review of their strategy, remaining constantly alert to any changes?	2i
2- Does your organisation analyse operational performance trends and core competencies to understand current and potential organisational capabilities?	2j
3- Does your organisation compare performance with relevant benchmarks to understand relative strengths and weaknesses?	2k
4- Does your organisation align individual and team objectives with the organisation's strategic goals and ensure they are empowered to maximise their contribution?	2l
5- Could most staff list the organisation's goals relevant to their activity, and are they familiar with the plans to achieve them in their own areas?	2m

3- People

	Link to Appendix I
1- Are the people plans (e.g. hiring, training, development) directly derived from the needs of the strategic plans and goals and capable of ensuring that plans and goals will be achieved?	4k

2- Is there an appraisal process (which is respected for aligning an individual's goals and training with the organisation's needs)?	4j
3- Does your organisation have a process that involves all employees in continuously reviewing, improving and optimising the effectiveness and efficiency of their processes?	3h
4- Does your organisation have a process to evaluate whether employees feel that they are well informed and that their opinions are valued?	Linked to employee feedback 4d
5- Are people's efforts in generating improvement and contributing to the organisation's success recognised, valued and rewarded?	4m

4- Partnership & Resources

Question	Link to Appendix I
1- Are partnership relationships developed to achieve mutual benefit and extra opportunities in products, services, markets and financial performance?	
2- Does your organisation have an approach that ensures that the allocation and use of its financial resources reflects and supports its strategic goals, aims and values and ensures the lasting success of the organisation?	
3- Are physical assets such as buildings, equipment, materials and stocks managed and continuously improved to the benefit of the organisation and of the community?	3i
4- Is there a routine method for identifying and evaluating alternative and/ or emerging technologies in the light of their impact on organisational performance and the environment?	3k
5- Does your organisation ensure that people are provided with accurate and sufficient information to support them in effective and timely decision making?	4n

5- Processes, Products and Services

Question	Link to the question in the study questionnaire
1- Does your organisation have defined processes and a defined approach to process management?	6a
2- Is there a comprehensive and reliable method (e.g. market research, customer surveys,etc) for understanding customer's perception, needs, and expectations and the markets in which it operates?	6h

3-	Does your organisation have meaningful process performance indicators and outcomes measures (clearly linked to strategic goals)?	6i
4-	Does your organisation compare its products and service delivery performance with relevant benchmarks and understand its strengths in order to maximise the value generated for customers?	6j
5-	Does your organisation continually monitor and review the experiences and perceptions of its customers?	6k

6- Customer Results

Question		Link to Appendix I
1-	Does your organisation regularly survey its customers to determine their satisfaction with its products and service?	5d
2-	Are the measures in (1) above (customer satisfaction with products and services) showing an improving trend or sustained high level of performance ?	5e
3-	Does your organisation monitor, understand and improve performance of processes that impact customer perception? (Such as response accuracy and timeliness, returns, lost customers, customer gains, complaints and praises ....etc.)	5f
4-	Are the measures in (3) above (the internal measures relating to customer) showing an improving trend and achieve targets?	5g
5-	Can you show that the results of these measures relating to customer satisfaction and loyalty are comparable with / better than those of industry average or best – in class organisations?	5h
6-	Are the customer results segmented to show the perceptions of the various groups and types of customers (including lost or potential customers)?	5i
7-	Can your organisation show that the results of surveys are always effectively used to improve the products or services it provides?	5j

7- People Results

Question		Link to Appendix I
1-	Is formal regular feedback collected (through questionnaires, interviews, focus groups..etc.) of the perceptions of the people on various aspects of the organisation such as, working environment, health, safety, communications, career prospects, pay, appraisal, recognition, training, and overall satisfaction?	7e
2-	Is all the people satisfaction results made known to the people and acted upon by the management?	
3-	Are the result (particularly the current perceptions of people satisfaction) generally showing an improving trend and achieve targets?	
4-	Does the organisation regularly measure and evaluate indicators which predict trends or influence people satisfaction and morale (such as absenteeism, sickness, staff turnover, early leavers, levels, of training, internal promotions, accident levels, recognition levels, grievances)?	7f
5-	Are the result of booth the organisation's internal measures and actual perceptions compared with those of other organisations?	

8- Society Results

Question		Link to Appendix I
1-	Is formal regular feedback collected (through questionnaires, interviews, focus groups...etc) of the perceptions of the society on various aspects of the organisation's reputation?	2n
2-	Can you demonstrate that your organisation has achieved results on preventing or reducing harm or nuisance to neighbours and the general environment, on conserving and protecting global resources (e.g. energy, recycling, waste)?	40
3-	Can you demonstrate that your organisation has achieved results on positively contributing to the community (education, charity, sports and leisure, leadership in professional matters)?	4p
4-	Are the activities in the above areas showing a sustained high performance and achieved targets?	4q
5-	Can the results be shown to be comparable with others in the locale, or business sector?	4q

9- *Key Results*

Question		Link to Appendix I
1-	Do the results of your organisation's key financial and non-financial outcomes (e.g. profits, margins, volumes, market share, performance against budget, etc) show an improving trend?	8a
2-	Do these key financial and non- financial outcomes have results that are comparable with / better than direct competitors or equivalent organisations?	8b
3-	Are these results segmented by the various parts of the business, markets, and / or products and service measured and known?	8c
4-	Is the performance of all activities (processes) that directly contribute to a product or service measured and known?	8d
5-	Are the result of these products and service activities showing an improving trend and achieved targets?	8e
6-	Are the results of these product and service activities compared with others and can they be shown to be comparable/ better?	8f
7-	Are the results of the support and administration activities (e.g. I.T. planning, legal, security, accounts) showing an improving trend and can they be shown to be comparable/ better than other organisations?	8g

Appendices L, M, N and O: are all available at the links below respectively

[1] http://www.mediafire.com/file/c0ni7qoqimiou44/Appendix+L.+Example+for+++PDSA_Model_DepartmentMatrix+for+groups.xls

[2] http://www.mediafire.com/file/opbc47tcllnval7/Appendix+M.+PDSA+model-+sample+++calculations+for+procedures+1+ans+2..xlsx

[3] http://www.mediafire.com/file/71qc4th59dm9saq/Appendix+N.+PDSA_Model+Leadership++++Example.xlsx

[4] http://www.mediafire.com/file/v5yksppz9033bl2/Appendix+O.+++PDSA_Model_CSFs_and_QAPs_+25+Feb+15+-+Copy.xls