CHAPTER 1

INTRODUCTION

Malaysia has moved into the new era of the 21st century based on the aspirations of Vision 2020 that aims to become an industrialized and developed country. Education plays a vital role in ensuring the attainment of the above goal. Thus, quality has been the main focus in the Malaysian Education System since the government has the intention of making the country the centre of educational excellence in the South East Asian region.

Education in Malaysia is under the jurisdiction of the Ministry of Education. The Ministry manages a comprehensive public school system, ranging from primary schools to universities. Compulsory education is administered at every state in the country under the supervision of the Directors of Education in each state and the respective district education officers, who are responsible for implementation of the national education policy in their own region. Malaysia provides education for all, regardless of where they live, their gender, social background, ethnic group or aptitudes and abilities. All children shall have the same right to 11 years of compulsory education, including 6 years of primary education, and shall receive this education in the local schools. After six years of primary education, students are automatically promoted to Form One, the foundation year for secondary school and continue to study until Form Five.
The mission of Ministry of Education is to develop a world class quality education system which will realize to the full potential of the individual and fulfill the aspiration of the Malaysian nation (MOE, 2002). The quality of public education has been discussed on many occasions during the recent years. Educational professionals at all levels are constantly asked to develop new ways to improve the quality of education. Efforts to improve the quality of the school systems are not new, but have received increasing attention lately especially for primary and secondary education. In conjunction with this, the Ministry of Education has fixed the theme of 2002 and 2003 Teacher’s Day Celebration as “Quality Teachers are the Aspiration of the Nation.”

Malaysian society always relates educational improvement and quality with student academic achievement. Students can achieve flying colors in examination and still not meeting tomorrow’s educational or business requirements. Focusing on improving student academic results only provides a temporary benefit for the society and should not be a long-term goal of education. The long term goal of the education system is to produce successful school learners and prepare students to become effective contributing members of society.

Changes are taking place in all parts of the globe among both developed and third world nations. Global competition, rapidly developing technology, sociopolitical and demographic diversity, and increasingly limited natural resources are stimulating changes in all social institutions around the world. These changing external environments have resulted in the educational
institution to emphasize on systems and process, cross-functional activities and collaboration and teamwork within the organization in order to remain competitive. Because of these changes, members of the educational institution especially the school teachers need to equip themselves with positive mindset in accordance to the principles and practices associated with quality improvement (Lewis & Smith, 1994).

Educational organizations are open systems that must respond to environmental changes in order to survive. Hence, improving the entire educational system should be the ultimate goal because once the system is improved, the outcomes will automatically improve. Undoubtedly, pockets of quality exist in every school system, the challenge educational professionals face is to document, measure areas of the existing quality and identify these areas for improvement.

The Malaysian education sector has undergone substantial growth and changes as a result of efforts made by the Ministry of Education to expand the education industry. The government allocates large sums of money through Malaysian Plans to develop the education sector. It is the government’s long-term goal to make Malaysia a regional centre of excellence in education.

The government has approved the formation of more higher education institutions in recent years to provide more places for candidates. There are now 20 public universities, 19 private universities, 17 private university colleges, 4 oversea university branch campuses, 16 local branch campuses,
and almost 500 other private colleges (MOHE, 2008). The large number of private higher education institutions reflects the government's policy of opening up the education industry to private entities. Under the Ninth Malaysian Plan, more primary and secondary schools will be built throughout the country to provide more places for compulsory formal education.

1.1 Background of the Problem

The Malaysian Government has always made serious efforts to improve the quality of the Public Service through the introduction of a series of performance programs. These efforts reflect the seriousness on the part of the Government to upgrade quality of services in the public sector. A quality Public Service will be capable of carrying out its responsibilities efficiently, besides providing excellent services to the public.

Since the launching of the Excellent Work Culture Movement in 1989, the Government has instituted various activities for further improving quality in the public sector, among which was the launching of the Manual On Quality Management and Improvement In the Public Service on 25 June 1990. This Manual gives emphasis, among other aspects, on the use of a Model for the Quality Improvement Process to implement quality improvement effort. 20 Development Administrative Circulars have been introduced since 1991, touching on various aspects such as the management of committee meetings, upgrading the quality of telephone service, the management of projects, upgrading counter service, etc.
Quality is an important area in the Malaysian public services and efforts in implementing quality management have intensified with the issuance of the Development Administration Circular No. 4/1991 entitled "Guidelines on Strategies for Quality Improvement in the Public Service" and the Development Administration Circular No. 1/1992 entitled "Guide on Total Quality Management (TQM) in the Public Service."

These Guides lay out several important management principles to be practiced by the Heads of Departments to ensure that the quality movement is continuously expanding. Moreover, the implementation of these principles will also create an environment that is conducive for the inculcation of an excellent work culture.

In the effort to upgrade the Civil Service, the Malaysian Government has initiated quality movement for the public sector by the introduction of TQM in the public service in 1992. Total Quality Management carries the expectations of "doing the right thing the right time, on time, all the time," always striving for improvement and always satisfying the customer’s requirements. Adopting ISO 9000 series of standard in 1996 through the Development Administration Circular No. 2/1996 entitled "Guidelines on the Implementation of MS ISO 9000 in the Public Service" helps government agencies to develop more uniform and internationally recognized quality management systems and further strengthened the implementation of TQM in the public sector (MAMPU, 2002).
The introduction of total quality management (TQM) and ISO 9000 certification in all government ministries and departments is carried via policies set up by its Public Services Department (Syed, Abdullah & Agus, 2000). The Public Services Department has appointed several certification bodies to conduct audits on government ministries, departments and agencies for the certification process.

In a study conducted by Lasserre and Probert (1994), the quality sophistication and expectations in Malaysia are found to be better than those in other growing economies of Asia and, in some quality dimensions, Malaysia is grouped with Japan. Quality improvement that has been emphasized in the private and manufacturing sectors is gaining attention in the public services especially in educational institutions. Quality improvement also has become nearly a standard agenda for staff and organizational development in higher educational institutions and schools.

The introduction of TQM by the Ministry of Education was formalized by the launching of a customer charter on 1 April 1996. The ministry formed a policy and quality section to monitor the implementation of the country’s education policy at all levels, based on TQM principles, and envisions that all schools and universities will eventually adopt TQM principles. To control the standards of public higher education institutions, the National Higher Education Council was formed in September 1996. A grading system for public higher education institutions was announced to assess the effectiveness of each department and faculty. While the above initiatives were
undertaken on a formal basis, schools in Malaysia which are part of the Civil Service and Ministry of Education, have their own institutional quality infrastructures and management procedures.

Thus, the Malaysian education system is in need of dramatic change and quality improvement is about change. In order to foster change, educational institutions have gathered in ideas from systems theory, psychology, management theory, human-resource and organizational development and statistical process control. All of these ideas aim to remake organizations so they become more focused, disciplined, quick-footed, humane and competitive (Marchese, 1993). Many of these efforts are aimed at reducing the level of criticism toward schools and traditional types of organizational operations (Bradley, 1993).

Continuous improvement is an organizational behavior that emphasizes on several important characteristics -- clear goals, mission, defined direction for the design and delivery of superior teaching and learning, continuous focus on results and the use of feedback in decision-making and efficient and effective use of resources (Frase, English, & Poston, 1995).

Since the issuance of Development Administration Circular No. 4/1991 and No. 1/1992, government agencies have undertaken various efforts to inculcate a quality culture. The implementation of TQM does not only benefit customers through quality outputs but it benefits the organization as well through cost saving and operational efficiency. Both the National Institute of
Public Administration (INTAN) and Institute Aminuddin Baki (IAB) were given the responsibilities for conducting quality management courses for educators and school managers since 1993. The IAB, as a center for educational excellence in the country, has also continuously implemented innovative programs to ensure school administrative mechanism runs smoothly, efficiently and effectively.

Apparently, TQM offers an effective way to improve quality management in education but not much has been documented on quality management development in public schools. Empirical literature and findings on quality improvement and TQM in the Malaysian context has been scarce compared to researches done in western countries. The need for the research in quality improvement and TQM can be proved also by the lack of previous studies especially in Malaysian education setting and consequently, the lack of structured knowledge of how to facilitate quality improvement in schools.

1.2 Statement of the Problem

There is a consensus that TQM is a way of managing an organization to improve its overall Management Practice and performance. Although Malaysian Government began to implement total quality management in public service sectors from 1992 onwards, the public sectors still lack effective quality management systems and application at the departmental level. The implementation of the education policy at all levels, base on TQM principles are monitored closely by the Ministry of Education.
A review of various local sources of records and researches related to Malaysia's quality management, it is found that little empirical research has been conducted in the area of TQM implementation in Malaysia's service sectors. Reports and articles on the implementation of Total Quality Management in Malaysian public sector are mostly anecdotal and descriptive in nature (Hashim, 1993; Hamzah, 1993; Awang 1998). Empirical studies on Total Quality Management in Malaysia are limited and are initiated by researches conducted by Syed et al. (2000), Lau & Idris (2001) and Lian (2002).

Owing to the limited empirical studies in the field of TQM, it is difficult for Malaysian education service to obtain sufficient information to support their TQM practices. In order to bridge the gap and provide Malaysian education service with practical assistance in the area of TQM practice, this study aims at identifying TQM constructs, developing an instrument for measuring these constructs, and empirically validating the instrument using data from Malaysian school system.

This study outlines the development of the School Quality Management Scale (SQMS) and confirms its reliability and construct validity for use in measuring quality improvement within the school management system. The SQMS is constructed and validated based on rigorous review of literature from several oversea researches on the implementation of Total Quality Management as key determinants of quality improvement strategies both in private and public sectors. In this study, the SQMS is also used to
evaluate the perceived quality of the school system to gain insights into the Quality Management Practices of the school management.

This study also addresses the importance of selected independent variables namely leadership style, organization culture, staff development, organization structure and demographic characteristics with regards to perceived quality on school system. These independent variables are identified as potential determinants and correlates of Total Quality Management. The relationship between these independent variables and the Quality Management Practices is also investigated in this study.

1.3 Rationale for the Study

The primary purpose of this study is to identify the constructs of quality management which are related to the school management and develop a scale for measuring these constructs in order to assess the quality and effectiveness of school management.

The second intent is to validate and evaluate the efficacy of the School Quality Management Scale (SQMS), the instrument which is developed and validated in this study to measure quality improvement on school management.

This study intends to identify the components of the SQMS that have the strongest correlation on the overall quality rating of the school management.
This study investigates the extent of any relationships among the determinants of the total quality management and the constructs of the School Quality Management Scale.

Finally, an initial application study is being conducted and this application study examines if there is any significant differences between excellence award winning schools and non-award winning schools on the components of quality management practices. Hypotheses testing on various aspects of the quality management practices between these schools are also investigated in the initial application study.

1.4 Research Questions

The study is carried out with the guide of the following questions:

i. What constructs of quality management strategies are relevant to school management?

ii. What is the reliability and validity of the SQMS in measuring the quality improvement and management practices and on school management?

iii. What components of the SQMS have the strongest correlation on the overall quality management rating in the selected schools?

iv. What are the relationships between the determinants of the total quality management and the constructs of the SQMS?

v. What are the differences between excellence award winning schools and non-award winning schools on the quality management level?
1.5 Research Hypotheses

To provide answers to the research questions for the initial application study, the following hypotheses serve as anchor for analysis of the predicted significant differences between award winners and non-winner on the Quality Management Practices. The relationships between the Quality Management Practices and the independent variables were also investigated.

Hypothesis 1: There are significant differences between award winners and non-winners on perceived level of School Quality Index.

Hypothesis 2: Excellence award winning schools will have higher levels of Quality Management Practices.

Hypothesis 3: Excellence award winning schools will have higher levels of Quality Performance.

Hypothesis 4: Quality Management Practices is significantly related to the Quality Performance.

Hypothesis 5: There is a positive relationship between Transformational Leadership and Quality Management Practices.

Hypothesis 6: Organizational Structure is significantly related to Quality Management Practices.

Hypothesis 7: There is a positive significant relationship between School Culture and Quality Management Practices.

Hypothesis 8: There is a positive significant relationship between Staff Development and Quality Management Practices.
1.6 Theoretical Framework of the Study

Base on the recent development of management theory and practice, managers believe that improvement of some aspects of the management process is not sufficient to achieve excellence or total quality in performance. The key to long-term success and quality performance includes total management of the internal environment and process to meet the customers' needs. Tenner and Detoro (1992) cited strategic Customers’ focus, continuous process improvement, total involvement and empowerment of school staffs are the critical elements of total quality management in school. According to Bradley (1993), the concepts and practices of total quality management in schools are believed to be a powerful tool to enhance education quality and upgrade school effectiveness.

The basic assumptions of this study are: schools are part of a system with their external environments - this means that the impact on the actions taken by the schools can be felt by the local communities, regions and nation in which the schools are located. Schools exist to meet the needs of individuals, organizations and other social institutions in their external environment. As part of the system, schools import resources (students and finances) from the external environment and export goods and services back into the external environment. Because of these inter-dependencies, schools are sensitive to changes in the external environment. Being sensitive to changes in the external environment means that school has to cope with the needs and wants of the society. (Bradley, 1993)
Another basic assumption of this study is to consider school as a learning organization. As cited by Leithwood, Aiken and Jantzi (2001), when schools behave as learning organizations, members of the school develop a clear and shared understanding of the school's mission and goals. The learning organization’s culture is truly collaborative where members of the organization contribute to one another's learning as non-routine problems of quality improvement are addressed. Learning organizations also evoke assumptions about learner as an active participant in the process and members of the organization take responsibility for self-management. The current concept of learning organization suggests that learning will not take place unless members of the organization adopt a systems perspective to thinking and solving problems. In this study, the systems perspective, as highlighted in Deming Theory of Profound Knowledge, means managing the whole school as well as its processes and components to achieve performance excellence.

According to Fisher (1994), the Malcolm Baldrige Award in education can be considered as a new quality movement. The Malcolm Baldrige Award framework for total quality management focuses the following key areas for assessing school performance and Management Practice such as leadership, Strategic Quality Planning, Customer Focus and Satisfaction, People Management, Process Management, Information and Analysis, Operational Results and impacts on society. These key areas are designed to help schools enhance their competitiveness by focusing on delivering ever improving value to customers and improving total organizational performance.
Total Quality Management model provides a more comprehensive perspective in understanding and managing quality improvement efforts in school system. This study uses the Deming Theory of Profound Knowledge and concept of TQM that focus on customer needs and expectations to develop a conceptual foundation for quality improvement strategies.

In this study, The Malcolm Baldrige Award was chosen as the theoretical basis for the identification of TQM constructs because it incorporates a number of different perspectives on quality, rather than focusing on one specific view. The key dimensions of the total quality management are categorized as Top Management Support, Strategic Quality Planning, Customer Focus and Satisfaction, Staff Total Participation, Continuous Improvement, Information and Analysis, and Quality and Operational Results.

The Baldrige Education Criteria for Performance Excellence focus on the key areas of school performance such as student learning results, stakeholder-focused results, school effectiveness and performance results, governance and social responsibility results. The use of this composite of indicators is intended to ensure that strategies are balanced and they do not inappropriately trade off among important stakeholders, objectives, or short- and longer-term goals (Mayer, Mullens & Moore, 2001). The core values and concepts of Malcolm Baldrige Quality Award are embodied in seven Categories of the Education Criteria for Performance Excellence, namely, Top Management Support, Strategic Quality Planning, Customer Focus and
Satisfaction, Staff Total Participation, Continuous Improvement, Information and Analysis, and Quality and Operational Results.

The theoretical framework of this research is based on the latest Baldrige Education Criteria Framework (Hertz, 2003) which is underlying key concepts from Deming Theory of Profound Knowledge (Deming, 1994). The theoretical framework as depicted in the figure 1.1, is modified to suit the local school context and the purpose of this study.

![Theoretical Framework of the Research](image)

*Modified and based on Baldrige Education Criteria for Performance Excellence Framework*

*Figure 1.1: Theoretical Framework of the Research*
As depicted in the framework, the school profile sets the context for the way the school operates. The environment, key working relationships, and strategic challenges serve as a crucial guide for the school management system. The system operations are made up of six categories that define the operations and the results the school can achieve. Top Management Support, Strategic Quality Planning and Customer Focus and Satisfaction represent the top management triad. These categories are put together to emphasize the importance of top management focus on strategy and customers. Top management sets the school direction and seeks future opportunities for the school.

The results triad is represented by Staff Total Participation, Continuous Improvement and Quality and Operational Results. The school operational results depend on the accomplishment of staff involvement and key processes in the system. All actions point toward Quality and Operational Results—a composite of student, stakeholder, and operational performance, including results related to school, staff and to social responsibility. The Information and Analysis serve as a foundation for the performance and quality management system.

The two-headed arrow indicates the importance of feedback in an effective management system while the bold arrow links the top management triad to the results triad. The linkage of the six categories to the Information and Analysis category reflects the integration of individual components of the management system that operates in a fully interconnected manner.
The School Quality Management Scale developed in this study was used to gather data on teachers’ perception regarding the seven components of quality management practices in the school management system as depicted in the theoretical framework above. This study also attempted to investigate the extent of quality improvement on the school management through the teachers’ rating on their current and ideal working environment.

1.7 Significance of the Study

In line with the mission of Malaysian Ministry of Education to develop a world class quality education system, much emphasis has been placed on the importance of quality management of the public school system. School top management and teachers have been encouraged to commit themselves to quality management strategies and quality improvement programs in order to fulfill the aspiration to be a fully developed and industrialized country in the year 2020. As this study is on the construction of a valid instrument to measure school management, the findings will serve as a guide or tool for measuring the management practice of the quality improvement programs in the school system. This study provides valuable insights of teachers’ perception on school management and how improvement programs can be planned to ensure continuous improvement in the school system.

Besides portraying a general picture of perceived quality by teachers concerning the school system, Findings from this study will provide the school administrators with ways to identify areas for quality improvement to meet the customer needs. Findings of this study will therefore be a significant
contribution to educational research on quality improvement of Malaysian school system.

This study also provides information and feedback to educational planners and policy makers concerning the implementation of quality assurance, quality control and total quality management in educational institutions especially in public schools.

1.8 Operational Definitions

To understand frequently used terms in this study, definitions are provided as follows:

1.8.1 Quality

The characteristics of service that depend on what is required or satisfy customer needs i.e. meeting customer expectations. These characteristics are performance, features, reliability and conformance. Quality is also defined as delighting the customer by consistently meeting and continuously improving on his requirements (Hand, 1992).

1.8.2 Total Quality Management

The management philosophy that all employees in an organization must make improvement to all work processes in order to meet customers’ expectation. TQM is defined as the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services (Ross, 1994). Total Quality Management (TQM) is a management concept
that focuses the collective efforts of all managers and employees on satisfying customer expectations by continually improving operations, management processes, and products (Berry, 1991).

1.8.3 Quality Improvement

A customer-focused strategic and systematic approach to continuous performance improvement in an organization and is synonym to quality management practices in this study.

1.8.4 MS ISO 9000

The Malaysian Standards of a specification for a quality management system. ISO 9000 is a proven quality management system which has been successfully adopted by a number of education and training institutions. Within education and training, the aim of the quality management system is to ensure that the provision of service is both consistent and continually improving. Quality system in the provision of education and training must also include administration and support services which contribute to the effectiveness of the institution as a whole and should be considered as part of the service.

1.8.5 Malcolm Baldrige National Quality Award

An award presented by the United States Government to businesses, companies, or organizations for their demonstration of excellence and exemplification of quality principles (Schenkat, 1993).
The purposes of the Baldrige Award are to promote awareness and understanding of the importance of quality improvement to the economy, to recognize companies for exceptional quality management and achievement, and to share information on successful quality strategies and benefits derived from the implementation of these strategies (Lee & Schniederjans, 1994). The seven criteria in the Baldrige Award help employers to assess both short and long-term strategic improvements, develop or enhance planning for continuous improvement, and increase customer satisfaction.

1.8.6 School Quality Management Scale

SQMS is a questionnaire designed, developed and modified to acquire perception of school teachers on seven constructs of total quality management modeled after the Malcolm Baldrige Quality Award on Education Criteria for Performance Excellence (Hertz, 2003). The Criteria is the basis for the school self-assessments, for giving feedback to help improve school performance practices, capabilities, and results.

1.8.7 School Quality Index

A ratio obtained by dividing the response score of the teachers’ perceptions on the current school management by the full score of five, expressed as a decimal. Ratios less than one indicate room for improvement; ratio equal one indicates meeting customer’s perfect expectations (Poston, 1995).
1.8.8 School System

A network of functions or activities within a school that works together for the aim of the school. A school system composes of many interacting subsystems which are geared towards the attainment of goals and objectives of the school.

1.8.9 Efficacy

The ability and quality of an instrument in measuring or achieving something to produce the intended results. It is determined by reviewing the psychometric properties of the instrument.

1.9 Organization of the Study

This study is made up of five chapters. Chapter one covers the introduction, background, rationale, research questions, research methodology and significance of the study. A review of selected literature examining quality, quality improvement, dimensions of quality management, researches on TQM, quality framework of Malcolm Baldrige National Quality Award and the theoretical framework are provided in Chapter Two. The research methods and procedures, including the sample, the data collection and the data analysis are described in Chapter Three. The findings of the study are presented in Chapter Four, A summary, conclusions and recommendations are provided in Chapter Five.
CHAPTER 2

REVIEW OF THE LITERATURE

Numerous studies have established a potential link between quality improvement and school management system. The literature on quality management and quality improvement is reviewed. Subsequently, the criteria categories of Malcolm Baldrige National Quality Award and dimensions of quality management in education based on the ideas of academic researchers are examined. The literature review focuses on the theoretical and practical aspects of this quality improvement strategies and efforts.

2.1 Definitions of Quality

There are various complementary definitions for quality. Quality has been generally defined as a degree of excellence, fitness for purpose or use, zero defect (Juran, 1993), conformance to requirements (Crosby, 1979), while Deming (1986) emphasizes that quality should be aimed at the needs of the customer, present and future. Meanwhile, the British Standards Institute identifies quality as the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied need.

According to Reeves and Bednar (1994), quality refers to excellence, value, conformance to specification and meeting and/or exceeding customers'
expectation. Hand (1992) defines quality as delighting the customer by consistently meeting and continuously improving on his requirements.

Quality begins with a vision, and any organization that does not have a leadership team to translate this vision into strategic and action plans will wander aimlessly into the future. This leadership team must have a vision for the future, a clearly defined mission and measurable goals to help to shape the future (Muse & Burkhalter, 1998).

Garvin (1988) identifies five approaches to defining quality:

i. the transcendent approach, where quality is based on experience;
ii. the product-based approach, where product characteristics is the base for quality;
iii. the user-based approach, where the user of a product or service decides the quality;
iv. the manufacturing-based approach that emphasizes conformance to specifications; and
v. the value-based approach that defines quality as a product or service that conforms to specific values.

According to Boaden (1997), quality management gathers a set of socio-technical theories and practices related to quality into a management discipline. Quality in this context means the extent to which organizational outputs satisfy “customers”. The purchaser of any product or service is
considered as a “customer”, but quality management extends this to the notion of shareholders, employees and society as a whole.

Mortimore and Stone (1990) cited that quality in education will change with time, reflecting society's interpretation of educational needs and the intensity of its moral and financial commitment to fulfilling them.

Therefore, the criteria for quality in education that relates the customer requirements, will involve a much greater number of interested parties. These customers include the government, education officers at various levels, board of school governors, community, parents, teachers, non-academic staffs and pupils.

2.2 Total Quality Management

Ross (1994) defines TQM as the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services. The goal of the organization is to meet customers’ expectation and satisfaction with the optimum involvement of the human resources within the organization.

Williams (1993) concludes that there are two dimensions of TQM. The first dimension regards TQM as a management tool to increase productivity, keep the customers happy, and cut down waste; secondly, it is a means of making us better people, of developing our professional good manners, and providing us with a moral education.
Total Quality Management is a strategic approach to produce the best products or services through a process of continuous improvement of every aspect of the organization’s operation. Ashcroft and Palaciao (1996) considered Total Quality Management as an approach to change the culture of an organization so as to create a constant search for improvement in practices and systems, particularly inputs, processes and outputs.

According to Deming (1986), the principle of Total Quality Management is that quality must focus on linkages among functions across entire organizations. Total Quality Management (TQM) is a management concept that focuses the collective efforts of all managers and employees on satisfying customer expectations by continually improving operations, management processes, and products (Berry, 1991).

TQM combines quality control, quality assurance, and quality improvement (Hoyle, 1994) and goes beyond traditional customer satisfaction by addressing the needs of internal customers, suppliers, and other stakeholders (Peach, 1994). Adopting the customer focus and systems orientation of total quality management can facilitate the achievement of the organization. Because of the popularity of TQM, many broadly accepted models promoting and improving quality have been designed. Organizations believe that they should implement two or more models to deliver quality products or services to their customers. The Baldrige Award, Deming Prize, and ISO 9000 Registration are three among many quality systems that may be taken together to establish excellent TQM programs.
The Conference Board, as cited by Boaden (1997), has reviewed 20 studies on Total Quality Management which are across different sectors and perspectives. A series of generic Total Quality Management element has been identified by the Conference Board and these generic TQM elements are as follow:

i. Customer first orientation;
ii. Top management leadership of the quality improvement process;
iii. Focus on continuous improvement;
iv. Respect for employees and their knowledge (employees are actively involved in the improvement process);
v. Reduction of product and process variation;
vi. Provision of on-going education and training of employees;
vii. Familiarity with a statistical way of thinking and the use of statistical methods throughout the organization;
viii. Emphasis on prevention rather than detection;
ix. View of vendors as long-term partners;
xi. Performance measures that are consistent with the goals of the organization;
xii. Standardization, the development of and adherence to the best known ways to perform a given task;
xiii. Emphasis of product and service quality in design;
xiv. Cooperation and involvement of all functions within an organization;
xv. Awareness of the needs of internal customers;
xvi. Substantial cultural change.
2.3 TQM and the Quality Gurus

The major quality gurus namely Deming, Juran, Feigenbaum and Crosby did not actually use the term TQM, although their work has subsequently been recognized as being relevant and sometimes quoted as referring to TQM. The term ‘quality management’ is commonly used and closely associated with the gurus who are often quoted as the “founding fathers” of TQM.

William Edwards Deming is most well known for his contribution to the field of quality management that emphasizes quality improvement and the development of a system of statistical quality control (Deming, 1986). He advocates quality as a predictable degree of uniformity and dependability, at low cost and suited to the market. He strongly believes that his 14 points for management should be incorporated into every level of the organization's operations. His principles which were developed to address product quality issues, should be applied at all levels and within all functions of the organization. Hand, (1992) indicates that TQM is called Deming-style management in some texts, it appears that TQM embodies a set of topical priorities that begins with top management.

According to Joseph Juran, quality is defined as fitness for use, in terms of design, conformance, availability, safety and field use (Juran, 1993). He emphasizes on the role of senior management in quality improvement. He includes the managerial dimensions of planning, organizing and controlling, and focused on the responsibility of management to achieve quality, as well
as the need for setting goals. The focus was on top-down management and technical methods, with a large emphasis on measurement, rather than Deming's focus on worker pride and satisfaction.

Armand Feigenbaum considers quality as a way of managing a business organization and quality improvement is being achieved by the participation of the whole workforce. A clear, customer-oriented quality management process is required. Feigenbaum (1991) emphasizes senior management understanding of the issues surrounding quality improvement, and the incorporation of these issues into management practice. Quality improvement is regarded as a good return on investment.

Philip Crosby has defined quality as conformance to requirements and not “goodness” (Crosby, 1979). He regards the effective way for a system in achieving quality is prevention and not appraisal. Zero defects should be considered as the performance standard and Crosby relates the measurement of quality as the price of non-conformance.

According to Clinton, Williamson and Bethke (1994), Deming is best known for statistical process control, Juran for project management, Feigenbaum for systems management and Crosby for company-wide motivation. In a study conducted by Ross (1994), some common themes among approaches of Deming, Crosby and Juran were highlighted. These included involvement of top management and leadership which are essential to the necessary culture of commitment to quality. Organization-wide efforts,
training, and long-term commitment are required for running programs for quality. Quality is the priority compared to schedule and inspection is not the answer to quality improvement.

2.4 Total Quality Management in Education

Total quality management (TQM) is a management philosophy developed by Deming based on his experiences in US industry before and during the Second World War. Although TQM was originally intended for the industrial sector, Deming (1986) pointed out that this management principle could be applied equally well in service sectors including government service and education.

TQM is a structured system for creating organization-wide participation in planning, and implementing a continuous improvement process to meet, and exceed customer needs and expectations. Owing to the demands of quality improvement, several education scholars began to look at the principles of TQM as a means to transform schools and the education system (Chao and Dugger, 1996). There were several factors that acted as drivers to implement TQM in education. The drivers include: 1) declining enrollment; 2) declining quality; 3) facilitating change; 4) increasing tuition; 5) changing demographics; 6) advancing technology; 7) intensifying competition among institutions; 8) demanding better quality graduates by employers; 9) declining retention rates; 10) recording students dissatisfaction with the overall service quality; and, 11) increasing governmental concern of rising tuition costs (Bosner, 1992).
In a few researches conducted by Byrnes (1992), Murgatroyd and Morgan (1993), and Field (1994) in the field of education, school personnel in the UK and the USA was found to have adopted TQM to impose quality standards through the development of strict accountability systems, competency-based education and testing. Consequently, school managers are now faced with mounting pressure to achieve results in the pursuit of efficiency, accountability and competition.

According to Harris (1994), there are three generic approaches to TQM in education. The first approach is on customer focus, where the idea of service to students is fostered through staff training and development. The second approach is on staff focus that values and enhances the contribution of all members of staff to the Management Practice of a school. The third approach relies on service agreement where it seeks to ensure conformity to specification at certain key measurable points of the educational process.

TQM has been applied to various levels of education. There have been experiments for the application of TQM at the elementary school level, high school level, and at the university level (Ray, 1996). Several challenges and issues of adopting TQM to education are 1) lukewarm response from the teaching community (Cobb, 1993); 2) concerns about change of focus and goals of education from pursuit of understanding to a job-placement service (Ray, 1996); and, 3) individual preferences and the loyalty towards personal teaching. One fundamental issue about the application of TQM is the definition of customer, producer, and market. Researchers have been
questioning whether the students are the customers, products or co-producers (Ray, 1996).

In summing up the definitions of TQM in educational setting, TQM is considered as a management tool that aims for “total”, and “quality assurance”. First, TQM implies meeting the expectations of all the customers in the educational system. The external customers which include education officers, the tax payers, parents and potential employers, should be satisfied with the standards of the school leavers, whereas the internal customers consist of teachers, students and supporting staffs, should be satisfied with the teaching and learning process in school. It targets the total process and output of the education system. Second, it emphasizes quality assurance to ensure conformity to specification of standards and requirement set out by the customers. Third, it is a management tool that highlights the means for measurement of academic performance and feedback.

2.5 Deming Theory of Profound Knowledge

According to W. Edwards Deming, as stated in Tribus (1994), “Experience alone teaches nothing”. A theory is needed to provide framework to understand the experience. The Theory of Profound Knowledge developed by Deming (1994) was originally aimed to improve the management of manufacturing sectors, but was later extended to service sectors. Deming's 14 Points for managing productivity and quality were adopted as the foundation for continuous improvement based on the Theory of Profound Knowledge. In a research conducted by Field (1994), Deming 14 Points for managing quality
and productivity have been applied in educational settings with considerably success.

The Deming Theory of Profound Knowledge specially recognizes the impact of the system in the behavior of people. The recognition that systems are the result of human decisions, actions and visions led Deming to see that knowledge is only possible given some appreciation of psychology (Tribus, 1994). This is because people must be taught and motivated to improve any system.

The Deming Theory of Profound Knowledge consists of four core values:

i. Appreciation for systems
ii. Understanding variation
iii. Theory of knowledge
iv. Psychology

Deming views a system as a network of functions or activities within an organization that work together for the aim of the organization. Any system is made up of many smaller, interacting subsystems. The components of any system must work together in order for the system to be effective. A School is a system that composes of many interacting subsystems which are geared towards the attainment of goals and objectives of the school. Deming believed that the aim of any system is for every stakeholder such as teachers, students, parents, community and the environment to gain over the long term. This
theory also applies to managing people. Tribus (1994) cited that the people work in a system, and the job of the manager is to work on the system to improve it, continuously, with their help. Teachers, students and other stakeholders who work within the school system can contribute to improvement and thus enhance their joy and satisfaction at work.

According to Deming, quality surely includes concepts such as dependability, reliability, consistency, uniformity, predictability and all these imply low variation. High variation is the antithesis of quality. Variation in quality context is undesirable and unnecessary, thus there is a need to reduce variation in order to improve quality. There are two types of variation i.e. stable and unstable variation. Deming explained that stable (in control) variation is due to common causes, while unstable (out of control) variation is due to special causes. Common causes produce variation which is a permanent feature of the process, whereas, special causes unpredictably change the behavior of the process, altering the nature of the variation which it produces.

Theory of knowledge is a branch of philosophy that is concerned with the nature and scope of knowledge, its presuppositions and basis, and the general reliability of claims to knowledge work (Tribus, 1994). Deming emphasized that there is no knowledge without theory, and experience alone does not establish a theory. Any rational plan, however simple, requires prediction concerning conditions, behavior, and comparison of performance. Theory can be used for prediction because it shows a cause-and-effect
relationship. Theory also allows prediction and that learning and improvement are based on the feedback from prediction.

Psychology is essential in understanding people, interactions between people and circumstances, interaction between leaders and employees, and any system of management. Deming believed that people need to be treated fairly and they are different from one another. A good leader must be able to identify these differences and use them to optimize one's ability and talent. A School has a great pool of people from various backgrounds and it is important for the school administrators to be aware of their abilities and preferences.

The four key concepts underlying the Deming Theory of Profound Knowledge are adopted as the theoretical foundation of quality improvement in this study. The conceptual framework of this study is developed by integrating this theoretical foundation and the latest Baldrige Education Criteria for Performance Excellence Framework (Hertz, 2003).

Besides, the following dimensions of quality are also recommended in dealing with the application of quality improvement principles in this study.

i. Commitment to Continuous Improvement - both breakthrough and incremental improvements.

ii. Commitment to Customer Satisfaction - meeting the needs and expectations of our stakeholders.
iii. Speaking with Facts - using meaningful data, analysis and synthesis to make decisions.

iv. Respect for People - enabling and empowering people and encouraging cooperation.

2.6 Deming Approach to Education

According to Deming (1986), the foundation of quality management or quality improvement is reducing the variation and then improving the average. This same concept must be applied to education as the first step of adopting Deming principles to education. One of the most effective approaches for reducing variation at minimum cost is co-operation. Optimization of any system, within the Deming approach, is realized by co-operation at all levels.

When adopting Deming philosophy to education, each school in its educational setting is a component of the whole educational system. Each school is obligated to accomplish the overall aim of the system, rather than focusing exclusively on maximizing its own performance. Otherwise, the effort among schools will be fragmented and the system will be sub-optimized (Deming, 1994).

Deming's methods are not only effective in managing schools, districts, and classrooms; they can also help to manage and use knowledge to the fullest advantage. The heart of Deming's philosophy is an insistence that management take pains to create a positive and productive climate in which
employees are continually kept together of the most effective methods and practices (Schmoker & Wilson, 1993).

2.7 Malcolm Baldrige National Quality Award

The Malcolm Baldrige Awards initiated by Congress in 1987, was created to promote quality awareness and recognition of quality improvement among manufacturing, service, and small businesses in the United States. The award criteria have been built upon business values of customer-driven quality, leadership, continuous improvement, employee participation and development, and fast response (Hertz, 2003).

Historically, these five qualities have roots in and are complementary to Edward Deming's Total Quality Management system. The Baldrige Awards criteria provide a framework for designing, implementing, and assessing ten business-oriented criteria: 1) Customer-driven quality; 2) Leadership; 3) Continuous improvement; 4) Employee participation and development; 5) Fast response; 6) Design quality and prevention; 7) Long-range outlook; 8) Management by fact; 9) Partnership development, and 10) Corporate responsibility and citizenship (Arcaro, 1995).

The purposes of the Baldrige Award program are to promote awareness and understanding of the importance of quality improvement to the nation's economy, to recognize companies for exceptional quality management and achievement, and to share information on successful quality strategies and benefits derived from the implementation of these strategies.
(Lee & Schniederjans, 1994). The criteria help employers to assess both short and long-term strategic improvements, develop or enhance planning for continuous improvement, and increase customer satisfaction.

The core values and concepts of the Baldrige Award consist of seven categories: 1) leadership, 2) information analysis, 3) strategic quality planning, 4) human resource development and management, 5) management of process quality, 6) quality and operational results, and 7) customer focus and satisfaction (Fisher, 1994). Conformance to these criteria is reviewed annually to reflect lessons learned during the evaluation process.

Companies use the award criteria as a “quality blueprint” for improving and/or evaluating quality or TQM programs, communicating better with suppliers and partners, and educating and training their employees (Evans & Lindsay, 1993). The Baldrige Award in the U.S., the Deming Prize in Japan, and the European Quality Award are recognized as the highest dividends for focusing on total quality in business, industrial, and recently in educational settings.

The Baldrige Award criteria are a blueprint for quality improvement in any organization, including educational institutions. The goals of the Baldrige Award for education are customer satisfaction, customer retention, and market share gain, which parallel student satisfaction, student retention, and student recruitment in academia (Heizer & Render, 1996).
In the past, few attempts were made to improve the quality of management in education, and goals were rarely identified or followed (Harman, 1994). Quality in education has been defined to mean many things, but few institutions have focused on quality management.

Recently, the quality of education has been severely questioned by the public and elected officials, but thus far no quality standard has been determined (Izadi, Kashef & Stadt, 1996). The three major industrial standards (i.e., Baldrige Award, Deming Prize, and ISO 9000 Registration) are examined so as to consider how they can help educational institutions and state education agencies plan for improving the quality of their services and increase their productivity.

Ideally, educators should already be practicing TQM principles; the concept has applications for educators in virtually every aspect of their mission. Education professionals should know that the Baldrige Award is the most far-reaching and broad-range source of standards.

According to Arcaro (1995), the Baldrige Award criteria have been extended to public and private schools, including elementary, secondary, colleges and universities. The results from the implementation are related to five pillars of "Total Quality Schools", namely, 1) Customer Focus and Satisfaction; 2) Total Involvement and Staff Development; 3) Quality in Operational Results; 4) Problem Prevention and Resolution, and 5) Continuous Improvement.
In the research conducted by Arif & Smiley (2003), the Malcolm Baldrige Awards are defined as an effort towards inculcating "accountability" in education. These awards use industrial successes as benchmarks to incorporate more business-styled efficiency at public and higher education sites. The research suggests how the Baldrige Awards apply the concept of quality to education, utilizes government directives, and then examines the practical implication of these awards.

2.8 Baldrige Education Criteria for Performance Excellence

According to Mayer, Mullens & Moore (2001), the Education Criteria incorporate the core values and concepts of Malcolm Baldrige Quality Award and are built upon the seven-part framework used in the Business Criteria. Adaptation is being made to the requirements of education organizations. The Baldrige Education Criteria are being used increasingly by U.S. education organizations to improve their performance. The Criteria have been updated to help organizations respond to current challenges: the need to create value for stakeholders; openness and transparency in governance and ethics; and the challenges of rapid innovation and capitalizing on knowledge assets.

The Criteria are the basis for the school self-assessments, for giving feedback to help improve school performance practices, capabilities, and results. The Criteria are also designed to serve as a working tool for understanding and managing performance and for guiding school planning and opportunities for learning. The Criteria are built upon a set of interrelated core values and concepts, namely, visionary leadership, organizational and
personal learning, valuing staff, managing for innovation, management by fact, social responsibility, focus on results and creating value. These values and concepts are embedded beliefs and behaviors found in high-performing organizations.

The Baldrige Criteria provide a systems perspective for managing an organization to achieve performance excellence. The Core Values and the seven Baldrige Categories form the building blocks and the integrating mechanism for the system. However, successful management of overall performance requires organization-specific synthesis, alignment, and integration. Synthesis means looking at the organization as a whole and builds upon key educational requirements, including the strategic objectives and action plans. Alignment means using the key linkages among requirements given in the Baldrige Categories to ensure consistency of plans, processes, measures, and actions. Integration means the individual components of the performance management system operate in a fully interconnected manner (Mayer et al. 2001).

2.9 Determinants of Total Quality Management

In this study, the potential determinants of Total Quality Management are categorized into demographic characteristics, leadership style, organizational culture and organizational structure, and staff development. These potential determinants of Total Quality Management are believed to be significant predictors on the implementation of the quality management practices in schools.
2.9.1 Demographic Characteristics

Education level of the employee was found to be a predictor of implementing quality management, meaning that, employee with higher education level were generally more receptive to new ideas (Hua, Chin, Sun & Xu, 2000). In a study conducted by Zeitz (1996), the lowest ranking employee in an Environmental Protection Agency office was found to have the most favorable attitude toward total quality management as compared to the others.

Huber, Sutcliffe, Miller and Glick (1993) cited that year of service in the post was inversely related to acceptance of change, implying that new managers implement more changes than those who have been holding the post for some time. Hambrick and Mason (1984) found that age was negatively related to taking risks because of the unwillingness to change usual organizational practices. However, Huber et al. (1993) found that there was no significant relationship between age and organizational change after controlling work experience and years of service. In another study conducted by Hosseini (1995), as cited by Lian (2002), gender and total quality management did not show any significant relationship.

2.9.2 Leadership Style

The role of leadership is recognized as critical to the success of quality initiatives (Deming 1986; Juran 1989), there is little empirical work on the leadership styles that support quality initiatives. Many
theoretical studies, however, have focused on the importance of transformational leadership in ensuring the success of TQM implementation (Waldman, 1994).

According to Locke and Latham (1990), the setting of objectives by top management is crucial because it determines the focus and direction of organizational activities. Leadership style plays a vital role in transforming these quality objectives into reality. Burke and Litwin (1992) cited that one of the important factors in attaining organizational change was the provision of an organizational vision and direction by the leader. Transformational leaders develop visions and obtain follower commitment in performing tasks (Bennis & Nanus, 1985) whereas transactional leaders make their followers obey them by using reward.

The concept of transformational leadership was introduced by Burns (1978) as cited in Jahnoun (2002), who argues that a transformational leader raises the needs and motivations of followers and promotes dramatic change in individuals, groups, and organizations. The transformational leader increases the confidence of individuals or groups, arouses awareness and interest in the group or organization, and attempts to move the concerns of subordinates to achievement and growth rather than existence. Transformational leaders guide their subordinates toward performance beyond
established standards and goals-emphasizing employee empowerment rather than dependence (Bass & Avolio 1994).

On the other hand, a transactional leader addresses the current needs of subordinates by focusing attention on exchanges. A transactional leader prefers a leader-member exchange relationship, whereby the leader fulfills the needs of the followers in exchange for their performance in meeting basic expectations. This implies that a transactional leader may have a preference for risk avoidance and is able to build confidence in subordinates to allow them to achieve goals (Bass & Avolio 1994).

According to Schuster (1994), Transactional leadership is found wherever power is the rule. Transformational leadership, however, appeals to people's higher levels of motivation to contribute to a cause and add to the quality of life. Transformational leadership holds promise for advancing associations, businesses, and society, because it can cause fundamental change, answer deeper issues, and create new paradigms. The implementation of total quality management, flattened hierarchies, and empowered staff are signs of transformational leadership at work.

Twelve qualities of the transformational leader were examined in a research conducted by Schuster (1994), the capacity to envision is found to be the most important quality. Other qualities include being
honest and empathetic; having a well-developed character without ego power; being able to share power and other related qualities.

With respect to quality initiatives, Jabnoun (2002) presented the leadership roles of quality assurance and TQM and related them to the factors of transformational and transactional leadership. The roles of TQM leaders are found to be highly consistent with the three factors of transformational leadership, while the roles of quality assurance leaders matched only partially with the transactional leadership factors.

Jabnoun (2002) conducted a research on the leadership style supporting ISO 9000:2000 using the multi-factor leadership questionnaire (MLQ) of transformational and transactional leadership developed by Avolio, Bass, and Jung (1999). Four dimensions of leadership style namely, intellectual stimulation, charisma, empowerment and contingent reward, and active management-by-exception were found to support the implementation of ISO 9000:2000 process. The dimension of empowerment and contingent reward was found to support implementation the most.

Transformational leadership strategies and total quality management implementation are found to be significantly related (West, Berman & Molakovich, 1998). On the other hand, Masi and Cooke (2000) cited that a positive but insignificant relationship was found between commitment to quality and transformational leadership, and
the relationship between commitment to quality and transactional leadership was found to be negative and significant.

2.9.3 Organizational Culture

Organizational culture is a set of values and guiding beliefs shared by members within an organization. According to Denison (1990), as cited in Pool (2000), culture serves as a foundation that reinforces a set of management practices and behaviors for an organization’s management system. Culture in an organization involved in TQM is referred to as a paradigm shift, the empowerment of employees and recognition of the value of the organization's human resource.

According to Ott (1989), organization culture contains five attributes, namely, language, artifacts and symbols, patterns of behavior; basic underlying assumptions and subcultures. Most organizations have a primary culture and several subcultures. The subculture, itself, has goals and attitudes toward the subculture as well as to the primary culture. The subculture may be supportive of the primary or may attempt to counter it. TQM rarely begins as the primary culture. It is more likely a subculture. Its task is to woo other subcultures and the primary culture to its values and principles.

Organizational culture has long been acknowledged to be important to the success of an organization. It is increasingly evident
that top management must have an explicit focus on the development and maintenance of their organization’s culture. Total quality management can create a culture and it is that aspect of TQM that managers must focus on (Gore 1999). Organizational culture in a diversified workforce is even more significant as it can facilitate quality improvement strategies in the system.

According to Hand (1992), organizational culture was a function of the values and beliefs of an organization. Successful organizations with a strong set of values and beliefs usually did not have the cultures explicitly laid out, but they actually existed. It was the positive culture that differentiated the total quality organization from others. Organizational culture was found to be an essential quality of excellent companies (Peters & Waterman, 1982). Employees in organizations with strong cultures knew how to behave without having to refer to written rules or procedures of the process. Culture was found to be a significant determinant of organizational performance.

TQM has been defined as an interrelationship between the organization’s culture; its relations with its customers, both external and internal; the use of organizational teams and cross functional teams; an emphasis on problem solving using teams, and recognition of the need for continuous improvement; and the use of measurement to evaluate systems and practices and to indicate the effectiveness of improvement efforts (Westbrook 1993).
Gore (1999) conducted a research to explore organizational culture and TQM. The research also emphasizes the importance of organizational culture and evaluates the extent to which TQM tends to affect the presence of specific cultural elements.

The results of research conducted by Pool (2000) indicated a positive and significant relationship with organizational learning was found when a corporation implementing TQM principles in a supportive organizational culture.

2.9.4 Organizational Structure

Organization structure refers to the allocation of tasks, authorities and responsibilities to achieve organizational goals. Hall (1987) defines organizational structure as how people interact with each other, how communication flows, and how power relationships are defined. It also refers to how job tasks are formally divided, grouped, and coordinated.

According to Burns and Stalker (1961), organizations may be structured organically or mechanically. They proposed organic organization structure and system were most relevant to organization in a dynamic state where conditions and requirements were continuously changing. Organizations with mechanistic structures focus on predictability which, in turn, increases control. However, when the environment is dynamic, inflexible control structures can prevent the
organization from reacting quickly and changing. Companies with organic structures tend to be more open to change and match the TQM emphasis on change and learning through strategies such as benchmarking, employee training, cross-functional teams, and experimentation (Crosby, 1979; Deming, 1986).

Mintzberg and Quinn (1992) referred that organic organizations are decentralized, flexible and have fewer levels in responding to rapid environmental changes and achieving organizational goals, whereas, mechanistic organizations depend on the hierarchy, formal authority and written rules to carry out their tasks. Such organizations are more suitable for stable environment when tasks are simple and repetitive because employees are given limited freedom and flexibility.

According to Quinn (1988), different value orientations of organizations can influence structure. Control oriented value systems try to consolidate management control by centralizing decision making in managerial hands and decreasing employee discretion and flexibility. This result in a highly mechanistic structure that emphasizes the importance of achieving high levels of production and efficiency through the use of formal procedures, centralized authority, direct supervision, and specialized labor. In contrast, companies with flexibility-oriented value systems attempt to decentralize decision making. In such organizations, problems are resolved at the point at which they occur, and subunits are based on workflow and process
instead of function. This results in a highly organic structure (Burns & Stalker 1961). Hence, organizations with flexibility-oriented organic structures that have existing horizontal coordination and communication networks appear to show a better fit with TQM practices such as employee involvement, empowerment, and responsibility for quality at the source.

Tata, Prasad and Thom (1999) conducted a study that examined the connection between organizational structure and the effectiveness of TQM implementation. It is found that organizational structure had a significant influence on TQM effectiveness. Flexibility-oriented organic structures were found to have higher levels of TQM effectiveness than those with mechanistic structure, the more organic the structure of the company, the more effective was its TQM program. As cited in Tata, Prasad and Thom (1999), Zammuto and Krakower (1991) empirically established that inflexible value systems are correlated with mechanistic structures and flexible value systems are correlated with organic structures.

2.9.5 Staff Development

Cheng and Tam (1994) defined staff development as different types of programs and activity which aim to empower teachers and administrators to develop positive attitudes and beliefs about education and management, become more effective individuals and teams, be competent in teaching students and managing the school process, as
well as helping the school adapt to its changing environment. Warren-Piper and Glatter (1977) referred staff development as carrying out a set of systematic activities to satisfy the personal interests, wants and needs of staff and at the same time satisfy the future needs of the organization.

Staff development is about supporting individuals, groups and organizations to understand, develop and refine their approaches to their work, to consider changes taking place and to develop new responses to them. Staff development should consist of two major aims, maintaining staff working efficiency and supporting personal growth. According to Cheng (1996), staff development has been gradually moving away from the external-control tradition into a school-based development mode. The conception, management and evaluation of the school-based staff development are conducted directly by the staff in the school. Cheng also defines staff development as the process including various activities that help the teachers and administrators to learn and develop to be more effective individual staff and more effective groups in teaching, managing the process of schooling, and helping the school as a whole to be effective in facing the changing educational environment.

As suggested in Cheng and Tam (1994), there should be balanced staff development activities at the individual, group and school levels in order to develop a shared school vision and to create a
collaborative school environment for better teaching and learning. The basic dimensions of staff development may include the domains of development (such as affective, behavioural and cognitive domains), the categories of actors (such as teacher and administrator) and the levels of development (such as the school, group and individual levels).

According to Cheng and Tam (1994), changes in the educational environment and the expectations of society require school practitioners to understand the dynamic and complex nature of education quality and to design staff development programs to achieve long-term quality and effectiveness.

One of the key functions of staff development is to develop a critical understanding in order that staffs reflect on and analyze changes, consider their implications and, where appropriate, make changes or modify the changes proposed or even resist change (Partington & Brown, 1997).

Partington and Brown (1997) argued that greater thought and action need to be devoted to strategic approaches to quality assurance of higher education provision and to staff development. The relationship between the two functions could be more explicitly acknowledged and exploited in order to support successful change and development in education and to achieve effective change management.
2.10 Possible Correlates of Total Quality Management

According to Fisher (1994), the Malcolm Baldrige Award in education can be considered as a new quality movement. The Malcolm Baldrige Award framework for total quality management focuses the following key areas for assessing school performance and management practice such as leadership, Strategic Quality Planning, Customer Focus and Satisfaction, People Management, Process Management, Information and Analysis, Operational Results and Impacts on Society. These key areas are designed to help schools enhance their competitiveness and organizational performance.

Total Quality Management model provides a more comprehensive perspective in understanding and managing quality improvement efforts in school system. In this study, The Malcolm Baldrige Award was chosen as the theoretical basis for the identification of TQM constructs because it incorporates a number of different perspectives on quality, rather than focusing on one specific view. The key dimensions of the total quality management identified in this study are categorized as Top Management Support, Strategic Quality Planning, Customer Focus and Satisfaction, Staff Total Participation, Continuous Improvement, Information and Analysis, and Quality and Operational Results.

Top Management Support examines how top management guides the school, sets school values, performance expectations and how the school addresses its responsibilities to the student, parents and other stakeholders.
Strategic Quality Planning examines how the school sets strategic directions and how it determines key action plans. It addresses deployment of plans, and how accomplishments are measured and sustained. It also stresses that learning-centered education and operational performance are key strategic issues that need to be integral parts of the school’s overall planning.

Customer Focus and Satisfaction examines how the school determines requirements and expectations of customers. It also seeks to understand the needs of current and future students and stakeholders and to understand the markets, with a focus on satisfying customers, building loyalty, and meeting students’ and stakeholders’ expectations, as well as their requirements.

Staff Total Participation examines how the school enables its workforce of academic and non-academic staffs to develop its full potential and how the workforce is aligned with the school’s objectives. It also addresses key human resource practices that are directed toward creating and maintaining a high-performance workplace with a strong focus on students learning and toward developing staff involvement and adaptation to change.

Continuous Improvement examines aspects of how key and support processes are designed, managed, and continuously being improved and maintained. It is the central requirements for efficient and effective process management. Agility, operational efficiencies and cycle time reduction are increasingly important to ensure continuous improvement.
Information and Analysis examines the management, effective use, and analysis of data and information to support key processes and the school's performance management system. It refers to all key information about effectively measuring and analyzing performance to drive improvement in student and operational performance. It is the “brain center” for the alignment of the school's programs and offerings and its strategic objectives. It also addresses knowledge management and all basic performance related information and comparative information, as well as how such information is analyzed and used to optimize school performance.

Quality and Operational Results examines the school's performance improvement in the following key areas: 1) customer satisfaction; 2) human resources; 3) operational performance. This category also examines how the school performs relative to its competitors. It provides “real-time” information as in the measures of progress for evaluation and improvement of educational programs, offerings, and services and the school’s processes, in alignment with the overall organizational strategy and performance.

2.11 Summary

The above review of literature shows that quite an extensive research has been done on Total Quality Management from the business and manufacturing perspective. TQM in education sector is a relatively new focus in the research field. This is probably due to the increasing emphasis on the management of educational institutions and teachers’ role in the school management. The review of TQM studies show that researchers have
investigated the relationship between TQM and the management of school as well as other educational institutions.

The literature also shows that the Baldrige Education Criteria for Performance Excellence focus on the key areas of school management. The core values and concepts of Malcolm Baldrige Quality Award are embodied in the seven Categories of the Education Criteria for Performance Excellence. In this study, the seven categories are being identified as, Top Management Support, Strategic Quality Planning, Customer Focus and Satisfaction, Staff Total Participation, Continuous Improvement, Information and Analysis, and Quality and Operational Results.

The present study aimed to develop a valid instrument to measure the quality management practices base on the Baldrige Education Criteria for Performance Excellence. The instrument is administered to investigate the quality improvement strategies in the school management base on the findings that consider TQM as a critical component for school success.

This study also attempted to investigate the relationship between the determinants of TQM, namely, leadership style, organizational culture, organizational structure, staff development and demographic characteristics on the seven components of Quality Management Practices. The possible correlates of Total Quality Management in this study as reviewed in the literature are depicted in Figure 2.1.
Figure 2.1: Possible Correlates of Total Quality Management
CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Type of the Study

This is a field study where a consolidated questionnaire battery of the School Quality Management Scale (SQMS) and possible correlates of Total Quality Management was used to determine the efficacy of the SQMS in measuring the quality improvement (School Quality Index) and Quality Management Practices of the school system in Kinta District.

3.2 Population and Sample

The population is the Malaysian teachers who are teaching in public secondary school. The sample consisted of 398 respondents from 20 secondary schools including two MS ISO 9000 certified schools and six excellence award winning schools on various fields in Ipoh City and suburbs of the city within Kinta District. Although this was not a national sample, the secondary school teachers selected were from divergent academic backgrounds, and of varied cultures. Thus, to some degrees, the sample could be said to be representative of Malaysia public school teachers. The selection of the award winners was based on the Excellence Performance Award Competition organized annually by the Perak State Education Department.
The questionnaire was also targeted to those schools which have already obtained MS ISO 9000 certification for quality management system standard. It is believed that ISO 9000 implementation is a stepping-stone towards the TQM journey. Participation was voluntary on the part of each school and efforts were made to include representative of different sizes and configurations. The schools selected were representatives of the district as a whole in size and geographic distribution. Agreements to cooperate in the study were obtained from the district education officer in order to increase the response rate. The questionnaire was distributed to senior assistants, head of department and teachers.

3.3 Instrument Development

During the last decade, self-assessment has been established as a technique for quality improvements. This technique has been developed and supported by different quality awards. Self-assessment is often defined as a process of evaluating an organization against a specified model (Hillman, 1994). According to Hillman, self-assessment is a comprehensive, systematic and regular review of an organization’s activities and results referenced against a model of business excellence.

The review of literature shows that there is increasing recognition of the importance of research based on quality award models such as Deming Prize and Malcolm Baldrige National Quality Award. The quality award models do not focus solely on product, service perfection or traditional quality management methods, but consider a wide range of management activities,
behavior and processes that influence the quality of the organizational performance. These award models provide a useful audit or assessment framework against which organizations can evaluate their quality management methods and the deployment of these methods.

Several studies dealing with empirically validated scales for integrated quality management have already been conducted abroad (Saraph, Benson & Schroeder, 1989; Flynn, Schroeder & Sakakibara, 1994; Ahire, Golhar & Waller, 1996; Poston, 1995; Black & Porter, 1996). The first three studies are broadly similar in that they are not based on any quality award framework for the identification of the TQM constructs. The fourth and fifth studies depend solely on the Baldrige Award quality award model for the identification of the TQM constructs. Each of these instruments has its own strengths and weaknesses in terms of constructs and measurement items.

To stimulate a culture for continuous improvements, self-assessment is used as a technique among the educators in quality evaluation. According to the goal of this study and the understanding of TQM practices, a particular tool, called School Quality Management Scale (SQMS) was developed in this study as a basis for the self-assessment work for measuring quality management for Malaysian school system. Structured interviews with the top management of selected excellence award winning schools were carried out first to obtain more in-depth information to provide an understanding of contextual background on quality management practices in the local school system.
Formulations of the items or statements in the SQMS were created, modified and adapted to the local school setting. This tool was built on the core values of “Perceived Quality Assessment Instrument” originally formulated and devised by Professor William Poston (1995) for measuring quality with community colleges of school districts at Iowa State University. The instrument was built based on Malcolm Baldrige National Quality Award criteria framework and related previous studies on quality management. The instrument consisted of seven dimensions: leadership, information and analysis, strategic quality planning, human resource development and management, management of process quality, quality and operational results, and Customer focus and satisfaction. Poston reported a Cronbach alpha of 0.96 for the instrument.

The SQMS did not capture every aspect of school effectiveness, but it aimed to gather reliable and valid information on those elements of management that teachers experience directly in the local school system. In order to identify the characteristics of the instrument, a comparison between the SQMS and several established instruments by different researchers (Saraph et al., 1989; Flynn et al., 1994; Ahire et al., 1996; Poston, 1995; Black & Porter, 1996) was conducted. The SQMS in the present study has two unique characteristics. Firstly, the SQMS covers education sector in a broader scope of TQM in comparison with other existing instruments. Secondly, all of the constructs in these instruments were carefully examined and these constructs were integrated as much as possible into the instrument of this study.
3.3.1 Construct Identification

The writings of Deming (1986), Crosby (1979), Feigenbaum (1991) and others have developed certain propositions in the area of quality management. Their insights into quality management provide a good understanding of quality management principles. According to their writings, TQM is defined as an approach to management that is characterized by the principles of customer focus, continuous improvement and teamwork.

There are several Quality Awards, such as the Deming Prize in Japan, the European Quality Award and the Malcolm Baldrige National Quality Award, which are based on a perceived model of TQM. The constructs of these TQM models must be operational for empirical work. This involves selecting a list of items to measure each TQM construct and testing the instrument for reliability and validity. For each construct, measurement of the actual level of TQM practice is represented by the mean of the item ratings for that construct. Based on the comprehensive review of the TQM literature, the following 11 constructs are considered to be the TQM implementation constructs:

i. Leadership;

ii. Supplier quality management;

iii. Vision and plan statement;

iv. Evaluation;

v. Process control and improvement;
vi. Product design;

vii. Quality system improvement;

viii. Employee participation;

ix. Recognition and reward;

x. Education and training; and

xi. Customer focus.

Out of the 11 constructs, only 7 constructs are believed to be related to the education system, Supplier Quality management, product design are not applicable in school system, whereas recognition and training are not directly relevant to the TQM implementation.

In this study, the SQMS consisted of 7 constructs of the above TQM practice with modification to suit the local school setting. The 7 constructs of TQM were adapted and categorized as top management support, strategic quality planning, customer focus and satisfaction, staff total participation, continuous improvement, quality and operational results, and information and analysis. These seven constructs of TQM were collectively labeled as Quality Management Practices in this study.

3.4 Psychometric Properties of the Instrument

In this study, the School Quality Management Scale was developed to measure quality improvement in the school system. This instrument consisted
of 7 scales of TQM practice which had to be empirically tested and validated. Many methods are available for empirically assessing the reliability and validity of a measurement scale. This section addresses how the reliability and validity of these scales are evaluated to determine the efficacy of the SQMS in measuring the quality improvement on Malaysian school system.

3.4.1 Item Analysis

A detailed item analysis evaluates the assignment of items or the statements to the scales in an instrument. The item-score to scale-score correlation are used to determine if an item belongs to the scale as assigned, is part of another scale, or should be discarded (Nunnally, 1978).

The scale-score of each of the seven constructs in the SQMS of this study was obtained by computing the arithmetic average or mean of the scores of the items that comprise that scale. If an item did not correlate highly with any of the scales, it had to be discarded. Saraph et al. (1989) used this method to evaluate the assignment of items to scales for developing their instrument. Generally, a correlation of item values greater than 0.5 indicates the items has been assigned appropriately to the relative scale. Whereas, item values lower than 0.5 do not share enough variance with the rest of the items in that scale. It is therefore assumed that the items are not measuring the same construct, and that it should be deleted from the scale (Creswell, 2002).
3.4.2 Reliability

The reliability analysis of an instrument assesses its ability to yield consistent measurements. Reliability relates to the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials. The reliability of the overall SQMS in this study was assessed by using the internal consistency analysis which is the most commonly used psychometric measure in assessing survey instruments and scales. Internal consistency is an indicator of how well the different items measure the same concept. The internal consistency of a set of measurement items refers to the degree to which the items are homogeneous, and is estimated using a reliability coefficient such as Cronbach’s alpha (Nunnally, 1978). Generally, reliability coefficients of 0.70 or more are considered good and reliable. An internal consistency analysis was also performed separately for the statements corresponding to each of the seven constructs in the SQMS.

The reliability of the overall SQMS and its seven quality management components scales were also assessed by using a test-retest reliability which was administered a sub-sample of 50 respondents from the original sample in this study after five months from the first field study. Correlations between the quality rating between the sub-sample and the origin sample on the quality management practices score were analyzed to examine the stability of the instrument. High test-retest correlations indicated a more reliable
scale. Generally, the correlation coefficient of greater than 0.7 indicates strong evidence of reliability (Nunnally, 1978).

### 3.4.3 Validity

Validity is defined as the extent to which any measuring instrument measures what it is intended to measure. There are three most popular methods to evaluate the validity of scales. These are content validity, criterion-related validity, and construct validity.

#### 3.4.3.1 Content Validity

Content validity depends on the extent to which an empirical measurement reflects a specific domain of content. Unlike the other validity analyses, content validity is not evaluated numerically, it is subjectively judged by various researchers who have specific knowledge of the subject-matter. According to Nunnally (1978), an instrument has content validity if it contains a representative collection of items and if sensible methods of test construction are used. The evaluation of content validity typically involves an organized review of the survey's contents to ensure that it includes everything it should and does not include anything it should not. Strictly speaking, content validity is not a scientific measure of a survey instrument's accuracy. Nevertheless, it provides a solid foundation on which to build a methodologically rigorous assessment of a survey instrument's validity.
As the literature review shows, the set of TQM constructs underlying Malcolm Baldrige Quality Award model is viewed as comprehensive by many researchers and practitioners. Since the instrument used for this study was based on the Malcolm Baldrige Quality Award Criteria for Education, it was therefore assumed to have content validity. The content validity of the SQMS was further justified by the advice and comment from several senior TQM lecturers from local public university lecturers regarding the suitability of items in the present study.

3.4.3.2 Criterion-related Validity

Criterion-related validity is "concerned with the extent to which a measuring instrument is related to an independent measure of the relevant criterion" (Badri & Davis, 1995). Thus a set of quality management constructs has criterion-related validity if the collective measure of the constructs is highly and positively correlated with a measure of quality performance.

Criterion-related validity is a measure of how well scales representing the various quality management practices are related to measures of product quality performance (the criteria) (Flynn et.al, 1994). Most secondary schools use a measure of school performance based on academic, co-curricular performance, customer satisfaction and priority in the choice of school. This is because the survival and the enrolment of the school depend on
these performances. The use of performance indicators has been criticized by many researchers as they merely indicate level of quality, they do not measure actual quality level. However, customer satisfaction as one measure of performance is a key feature to TQM because it contributes to the school excellence.

In this study, correlation analysis was employed for testing criterion validity. The criterion-related validity of the combined set of seven TQM constructs in this study was evaluated by examining the multiple correlation coefficients computed for the seven TQM constructs and an outcome measure of performance. The outcome measure was the school's quality performance, as measured by academic and non-academic performance, which was included in the SQMS. Generally, the correlation coefficient of greater than 0.6 indicates strong evidence of criterion-related validity. If the correlation between TQM constructs (predictor set) and the school quality performance (the criterion set) is strong and significant at the 0.01 level. It is therefore concluded that the SQMS has good criterion-related validity.

3.4.3.3 Construct Validity

Construct validity measures the extent to which the items in a instrument measure the same construct (Flynn et al., 1994). The construct validity of each construct measure is evaluated separately by factor analyzing the items corresponding to the construct.
The construct validity of the SQMS in this study was evaluated by the use of factor analysis. Factor analysis addresses the problem of analyzing the interrelationships among a large number of variables and then explaining these variables in terms of their common underlying factors. The purpose of factor analysis is to find a way of condensing or summarizing the information into a smaller set of new composite factors with a minimum loss of information (Hair, Anderson & Black, 1992).

In order to determine the construct validity, each factor is subjected to an individual principal components factor analysis to check for unifactoriality. Unifactoriality means that a single factor is extracted for each test. The unifactorial nature of each factor is a measure of construct validity (Black & Porter, 1996). Principal component analysis was performed on the SQMS and each scale was factor analyzed separately. Factor loadings greater than 0.30 are considered significant; loadings of 0.40 are considered more important; if the loadings are 0.50 or greater, they are considered very significant (Hair et al., 1992). In this study, a factor loading of 0.40 was used as the cut-off point.

When the items in a scale are loaded on more than one factor, the rotated varimax solution is examined. Since the latent root criterion (eigenvalue) is the most commonly used technique for factor extraction, it is therefore selected as criterion for factor extraction. In
principal component analysis, only the factors having eigenvalues greater than 1 are considered significant; all factors with eigenvalues less than 1 are considered insignificant and disregarded. The percentage of variance and scree test was also used as criteria for extraction of components in this study.

3.5 Research Instrument

The research instrument in this study was made up of three parts: Demographic Profile, Part A: The School Quality Management Scale (SQMS) that measures the attitude toward School Quality Management Practices (the dependent variable) and Part B: Items on the Independent Variables.

Demographic Profile was designed to collect demographic and background data about the respondents. It consisted of questions related to age, ethnic, gender, educational level, position, tenure, teaching area, school type, and Quality-related courses or training attended.

Attitude toward School Quality Management Practices was measured by using the School Quality Management Scale (SQMS). The SQMS in this study was unique because it could be used to calculate the School Quality Index which is the ratio of the current and the full scores of perception on each item of the seven constructs of total quality management practices. This ratio is modified and built on the core values of “Perceived Quality Assessment Instrument” originally formulated and devised by Professor William Poston (1995) for measuring quality with
community colleges of school districts at Iowa State University. The formula for the ratio is expressed as follows:

\[ SQI = \frac{R_c}{F_s} \]

<table>
<thead>
<tr>
<th>SQI</th>
<th>School Quality Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>R_c</td>
<td>Rating of Current Situation</td>
</tr>
<tr>
<td>F_s</td>
<td>Full Score = 5</td>
</tr>
</tbody>
</table>

The ratio between perceived quality and optimum expected quality was used to produce the School Quality Index (SQI). The SQI in this survey measured the teachers' perception of management quality (ranging from 1 to 5), against the full score of optimum desired management quality (score 5). The calculated SQI is used as a basis for comparison across school system and this ratio indicates the standing of the quality attribute, where improvement needs to be implemented.

The SQI value ranged form 0.2 to 1, where 1 indicates desired optimum management quality is achieved since the ratio between perceived quality is 5 and the optimum desired quality is also 5. If a teacher rates his quality expectation as less than 2, the SQI calculated will be less than 0.4. Thus, for the purpose of this study, the score of 0.4 is proposed as low management quality and there is capacity for improvement. The SQI score of 0.6 indicates moderate quality management being implemented and quality improvement efforts are encouraged while 0.8 reveals high level of quality management. In other words, if a school system has a SQI of 0.50, it is only approximately 50% of the way toward the ideal or perfect level of quality and
indicating ample room for improvement. Thus, the range of 0.2-0.5 is considered as the critical SQI where improvements of those quality attributes in these categories are strongly recommended.

In this study, The School Quality Management Scale (SQMS) was modified and adapted by the researcher to cater for the suitability to the local context and public schools in Malaysia. Six to eight items were developed and included in each dimension. Statements were modified or formulated by the researcher for addressing the operations and functions of school in Malaysian context. The modified instrument consisted of 7 components of Total Quality Management, namely, top management support, customer focus and satisfaction, strategic quality planning, staff total participation, information and analysis, quality and operational results, and continuous improvement.

The outcome of quality performance that includes statements regarding the academic and non-academic achievement, efficiency and satisfaction with school system is also created to gain insights into the total quality management practices in the school system. Priority in the choice of school by parents is also emphasized as an indicator of quality performance. This is because the survival and the enrolment of the school depend on these performances.

The respondents in this study were required to report their subjective perception or to indicate the extent of their disagreement and agreement on 5 point Likert-type scale on the current situation of their school system. The
Likert-type scale is made up of responses that include "strongly agree, agree, neutral, disagree, and strongly disagree".

The independent variables in this study are as follows: leadership style, organizational culture, staff development and organizational structure. The Global Transformational Leadership (GTL) scale developed by Carless, Wearing & Mann (2000) is selected for use in this study to measure transformational leadership. Carless et al. reported a Cronbach alpha of 0.93 for the GTL scale. The organizational culture is measured with the scale by Leithwood et al. (2001) with modification to suit the local school climate. The organizational structure is measured by using the scale developed by Khandwalla (1977) for measuring the extent to which organizations are structured mechanically versus organically. Khandwalla reported a reliability coefficient of 0.76 for this scale. The staff development on the other hand, is measured using the scale developed by the researcher based on the review of the related literature.

All the items in the School Quality Management Scale (SQMS) and the scales for independent variables were initially formulated in English by the researcher. The formulated items were translated into Bahasa Malaysia by using the three-step back translation procedure as used by Brislin (1986) to check on the accuracy of translation. The original items were first translated from English into Bahasa Malaysia by a senior bilingual teacher. The translated Bahasa Malaysia version was then translated back to English by another senior bilingual teacher who had not seen the original English version
of the instrument. Both the translated English version and the original English version of the instrument were compared for the content accuracy and they were found to be quite similar to each other. Two senior English and Bahasa Malaysia language teachers were consulted to check on the instrument. Minor corrections and adjustments were made in both the English and Bahasa Malaysia version of the instrument to ensure clarity in meaning and the suitability of the terms used.

A pilot test on the SQMS was conducted among 32 secondary school teachers who attended the English for the Teaching of Mathematics and Science Course in Ipoh. These teachers were not involved in the actual study. It was found that the teachers were generally able to give appropriate response to the statements in the instrument. The Cronbach's alpha for the measure of internal consistency of the pilot test was above 0.60 and this revealed that there were no obvious inappropriate or irrelevant items found in the instrument. Thus, no inappropriate items were discarded or no additional items were inserted for increasing the coefficient alpha at this stage.

3.6 Data Collection and Analysis

The questionnaires were distributed by the researcher through the school administrators with the written permission from State Education Department. In order to preserve anonymity, the survey package was not marked or numbered in any way. Respondents were not given any time frame to answer the questionnaires but the completed questionnaires were handed back to the school administrator without delay.
Data collected was analyzed using the Statistical Package for Social Science (SPSS) software and personal computer. The items on the School Quality Management Scale were ranked on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Means for each respondent on for each statement were computed. Means for each respondent for the current situations were calculated and the School Quality Index was also determined as well by dividing the score of the current situation divided by the full score of 5. Means for other scales on the independent variables were also computed.

Both descriptive and inferential statistics were applied to analyze the data. Descriptive statistics were computed on the demographic profile of the SQMS. T test and one-way analysis of variance (ANOVA) were computed to find out whether there were significant differences on the quality rating between the demographic groups.

First phase of this study was focusing on the suitability of the SQMS for measuring the quality management practices in school. Reliability and validity of the SQMS were carefully examined and analyzed to justify the efficacy of this quality improvement measurement instrument.

Factor analysis is used to identify factors that statistically explain the variation and covariance among the TQM construct measure. Factor analysis is a data reduction technique that uses correlations between data variables or items. The underlying assumption of Factor Analysis is that a number of factors exist to explain the correlations or inter-relationships among observed
variables or items (Chatfield & Collins, 1992). For the present study, a Factor Analysis was first performed on all 50 items using principal components extraction (Tabachnick & Fidell, 1989). The goal of this method was to extract maximum variance from the data set within each factor. It was basically used to reduce a large number of variables down to a smaller number of components. For the simplicity of analytical purpose, each statement on the questionnaire was coded with a label. A scree plot of eigenvalues against the number of factors was used for the extraction of factors (Kachigan, 1991). The number of factor selection was judged where the discontinuity in eigenvalues occurs, but with an eigenvalue greater than 1 (Tabachnick & Fidell, 1989). In this study, the cut-off point for analyzing the factor loadings was 0.5 based on Comrey's guidelines (Tabachnick & Fidell, 1989). The high factor loading of 0.5 and above implies the factors and the variables are critical in the instrument.

Internal consistency analysis is employed to examine the psychometric properties, such as the reliability of the instrument. According to Black (1999), reliability is an indication of consistency between two measures of the same thing. The reliability of the factors is determined in order to support any measures of validity that is employed (Nunnally, 1978). In this study, the internal consistency analysis was employed to measure the reliability of each derived factor from the factor analysis. The reliability coefficient is called Cronbach's alpha and generally an alpha of 0.70 or higher is considered good. With regard to the validity test; face validity, content validity, criterion-related validity and construct validity are conducted to ensure the data collected is
valid. The efficacy of the research instrument is judged and supported by observing the high reliability coefficient and strong assessment on the analysis of validity.

The reliability coefficient was also calculated for all the scales used in this study to measure independent variables to determine the internal consistency for each of the scales. Multiple Regression analyses were used to measure the strength of relationship between potential determinants of TQM and the overall quality rating of school system. Besides, Pearson Correlation Coefficient was also employed to analyze the data for the degree of linear relationship between the seven TQM constructs and the each of the independent variables.

In the second phase of this study, initial application of the SQMS was conducted to 91 teachers from the excellent award winning schools and non-award winning schools located within the Kinta District.

An independent-samples t-test was used to compare the mean score of the quality rating for current situation between these schools. t-tests were also conducted to examine the mean score of quality rating between gender and school location. Preliminary analyses using the one-way analysis of variance (ANOVA) were conducted to compare the responses of demographic groups. The one-way ANOVA with post-hoc tests were used to determine differences between the three ethnic groups, three academic qualification of teacher and three teaching subjects.
CHAPTER 4

ANALYSIS AND RESULTS

This chapter describes the analysis techniques employed in the present study and it is divided into three main sections. The first section examines the summaries of characteristics of the respondents. The psychometric properties of the measurement scales used in this study are divided into two phases of study and are reported in the second section. Findings concerning the substantive research questions are discussed in the last section together with the results of the data analysis.

4.1 Analysis of Respondents’ Characteristics

A total of 500 questionnaires were distributed to teachers of twenty secondary schools in the Kinta district of Perak state, 412 were returned yielding a response rate of 82.4 %. 14 questionnaires were discarded because there were either non-responses, unintentional omissions or unidentifiable marks on some items of the survey. After examining and sorting out, only 398 questionnaires were found to be complete and were used for the analysis. The ages of these participants ranged from 23 to 56 years old. The sample obviously consisted of a good representation of young and experienced teachers. These teachers started their teaching career with either a teaching certificate or education diploma in addition to their basic academic qualification. The breakdown of the academic qualification of the
teachers who participated in this study was as follows: Master Degree holders (n = 29), Degree holders (n = 326), Diploma holders (n = 43). Out of the 398 respondents, 366 of them are teachers, 15 are senior teachers and 17 are senior assistants as depicted in Table 4.1.

Table 4.1.

Post and Academic Qualification of Respondents (N=398)

<table>
<thead>
<tr>
<th>Post</th>
<th>Diploma</th>
<th>Degree</th>
<th>Master</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>43</td>
<td>303</td>
<td>20</td>
<td>366</td>
</tr>
<tr>
<td>Senior Teacher</td>
<td>0</td>
<td>11</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Senior Assistant</td>
<td>0</td>
<td>12</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>326</td>
<td>29</td>
<td>398</td>
</tr>
</tbody>
</table>

A majority of the teachers that participated in this study were females, which is equivalent to a total of 292. The percentage of female teachers in the sample was 73.4 %, mostly of Malay ethnicity (59.6 %), followed by Chinese (29.8 %) and Indian (10.6 %). Meanwhile, a total 106 male teachers made up 26.6 % of the respondents in the sample, in which the Malay and Chinese ethnicity were 50.9 % and 37.7 % respectively and followed by 11.4 % of Indian ethnicity. The demographic characteristics of the respondents were summarized and shown in Table 4.2.
Table 4.2.

*Gender and Ethnicity of Respondents (N=398)*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Malay</th>
<th>Chinese</th>
<th>Indian</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>54</td>
<td>40</td>
<td>12</td>
<td>106 (26.6%)</td>
</tr>
<tr>
<td>Female</td>
<td>174</td>
<td>87</td>
<td>31</td>
<td>292 (73.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>127</td>
<td>43</td>
<td>398 (100%)</td>
</tr>
</tbody>
</table>

(57.3 %) (31.9 %) (10.8%)

The years of teaching experience (1 to 33) and the span of ages of the respondents (23 years to 56 years) suggested that the sample captures a broad cross section of the population of teachers in the secondary schools. The sample obviously represents a group of experienced teachers with an average tenure of about 13 years.

Figure 4.1 shows a stem-and-leaf plot of the teaching experience of the respondents. The average teaching experience of the respondents was about 13 years. One hundred and thirty one of the teachers have less than 10 years of teaching experience. One hundred and twenty nine of the teachers have 10 to 15 years of teaching experience, one hundred and twenty of them have 16 to 25 years of teaching experience and eighteen of them have more than 25 years of teaching experience.
4.2 Phase I: Exploratory Factor Analysis and Initial Validity and Reliability

The purpose of phase 1 of this study was to examine the factor structure underlying the item pool of the School Quality Management Scale (SQMS) by using exploratory factor analysis. A secondary purpose was to establish initial evidence for construct-related validity and reliability of the School Quality Management Scale (SQMS).

A total of 60 items were written based on the 7 dimensions of Malcolm Baldrige National Quality Award criteria framework as studied by Poston (1995). The seven dimensions were: leadership, information and analysis, strategic quality planning, human resource development and management,
management of process quality, quality and operational results, and Customer focus and satisfaction.

Experts were consulted to judge each item on appropriateness to the quality construct. The five experts were two education officers who were actively involved in the assessment of the internal auditing for MS ISO 9000 school at state level and three experienced principals of the award winning schools. The items addressing each factor were then reduced to 50 items. Items judged as inappropriate to the skill were dropped. Appropriate number of items was ranging from 5 items to 8 items for each of the 7 dimensions with the highest mean rating of clarity (Tabachinck & Fidell, 1996).

4.2.1 Method

The sample for this study was 398 secondary school teachers (292 female, 106 male) teaching in Kinta district of Perak state. The respondents completed the 50-item questionnaire in a single administration in their respective schools in May 2004. The survey was conducted personally by the researcher with the help from the senior assistant of the respective schools. Respondents were not given time limit and the completed questionnaire could be submitted on the same day or the following day.

Five months later, the instrument was re-administered to 50 teachers who had previously taken the survey for evaluating the test-retest reliability (Tabachinck & Fidell, 1996).
4.2.2 Instrument

Participants completed a questionnaire that contained the School Quality Management Scale (SQMS), the Revised Leadership Style Scale, the Organizational Culture Scale, the Staff Development (revised for academic contexts) and the Organizational Structure Scale. In addition to responses to the quality management items, information was abstracted from the demographic profile of the respondents.

The School Quality Management Scale (SQMS) was a 50-item scale that intends to measure teachers' perception on the quality improvement practice on the school management. Sample items are: 'The school focuses on using data and analysis of results to make decision', 'The school has developed procedures that enable teacher to quickly respond to customer's needs', and 'Top management regularly communicates the quality standards to all the teachers'. Respondents were required to rate each item on bipolar agree/disagree statements on a five-point Likert scale in which 1 = "Strongly Disagree," 2 = "Disagree," 3 = "Neutral," 4 = "Agree," 5 = "Strongly Agree ". Five items were negatively phrased, which were given the appropriate value for recoding prior to the data analysis.

The mean composite scores of Quality Management practices were obtained by adding up the fifty items of the SQMS and divided by fifty. The range of possible mean scores on the instrument was 1 (low quality management practices) to 5 (perfect or full quality management
practices). Due to lack of a better measure, Poston (1995) suggested that one might choose to interpret any scores above the midpoint of 3.0 as representative of moderate quality management practices. There is some basis for selecting this apparently arbitrary midpoint value as a breakpoint between low scores and high scores. Poston (1995) as cited the original perceived quality assessment instrument that was administered with community college students, the mean score of the study was very near to the midpoint (median) value, and was used to interpret a score of more than the midpoint value as moderate quality management practices.

The Global Transformational Leadership (GTL) scale developed by Carless et al. (2000) was modified and used as the Revised Leadership Style Scale in this study to measure transformational leadership. Carless et al. reported a Cronbach alpha of 0.93 for the GTL scale. The organizational culture was measured with the scale by Leithwood et al. (2001) with modification to suit the local school climate. The organizational structure was measured by using the scale developed by Khandwalla (1977) for measuring the extent to which organizations were structured mechanically versus organically. Khandwalla reported a reliability coefficient of 0.76 for this scale. The staff development on the other hand, was measured using the scale developed by the researcher based on the review of the related literature.
The scales used in this study are described and classified as given in Table 4.3. This is because some social science methodology experts argue that statistical analysis procedures such as regression and Pearson correlation may be validly used on ordinal data, rather than on interval data because there is no physical unit of measurement (Tabachinck & Fidell, 1996).

Table 4.3.

_**Characteristics of SQMS and Scales of the Correlates Study**_

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Polar Extremes</th>
<th>Range of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>Low – High</td>
<td>42 – 210</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>Unfavorable – favorable</td>
<td>6 – 30</td>
</tr>
<tr>
<td>Transformational Leadership Style</td>
<td>Unfavorable – favorable</td>
<td>6 – 30</td>
</tr>
<tr>
<td>Staff Development</td>
<td>Limited – Extensive</td>
<td>6 – 30</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>Mechanistic– Organic</td>
<td>5 – 25</td>
</tr>
</tbody>
</table>

This means that all the variables in this study are ordinal, except for TQM knowledge, gender and years of teaching experience. According to the research conducted by Harwell and Gatti (2001), most of the dependent variables in educational research possess an ordinal scale of measurement in which the relative differences among values composing the scale are unequal in terms of what is being measured. Ordinal data do not attempt to quantify the differences between scores, they only specify order. Many statistical procedures used in educational...
research are described as requiring that dependent variables follow a normal distribution as in this study, which implies that these variables should have an interval scale of measurement. In the present state of measurement, it was unsure that the instruments of measurement have equal intervals. Kerlinger (1986) argued that, “The best procedure would seen to be to treat ordinal measurements as though they were interval measurements, but to be consistently alert to the possibility of gross inequality of intervals” (p. 403).

Harwell and Gatti (2001) has successfully used the measurement technique known as item response theory to rescale ordinal data concerning the student performance to an interval scale in their research and argued that educational researchers should routinely consider rescaling ordinal data to interval data to facilitate score computation. The advantage of an interval scale is that the relative difference among values composing the scale are assumed to be equal in terms of what is being measured, thus, arithmetic operations such as addition and division are allowed in order to compute the scores obtained from the Likert scale.

By adopting the measurement technique as suggested by Harwell and Gatti (2001), the mean composite scores of SQMS in this study were obtained. Thus a person with SQMS score of 176 or a mean of 4.19 was considered to have perceived that the school has practiced higher level of quality management strategies than a person
with a SQMS score of 170 or a mean of 4.05. The person scoring 3.5 was, in turn, exhibited the perception of more quality management practices than a person with a score of 3.4.

4.3 Factor Analysis Results

In the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, the test statistic of this study yielded a value of 0.96. According to Kaiser as cited by George & Mallery (2003), a measure of > 0.9 is marvelous while < 0.5 is unacceptable. This clearly indicated that the survey data was adequate for conducting factor analysis. Bartlett's Test of Sphericity is a measure of the multivariate normality of the data set distributions. According to George & Mallery (2003), the Bartlett's test also examines whether the correlation matrix is an identity matrix. A significance value < 0.05 indicates that the data do not produce an identity matrix and are thus approximately multivariate normal and acceptable for factor analysis. The significance value of < 0.01 in this study was ideal for factor analysis as depicted in Table 4.4.

Table 4.4

*KMO and Bartlett's Test*

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</th>
<th>0.96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett's Test of Sphericity</td>
<td>Approx. Chi-Square</td>
</tr>
<tr>
<td></td>
<td>df</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
</tr>
</tbody>
</table>
Factor analysis is a statistical technique for analyzing the correlations between a number of variables in order to reduce them to a smaller number of underlying dimensions, called factors. It also attempts to identify underlying factors that explain the pattern of correlations within a set of observed variables. Factor analysis was used in this study to define dimensions underlying existing measurement instrument. Principal components analysis with a varimax rotation was performed on the School Quality Management Scale survey data obtained from the 398 respondents. Principal components analysis is an empirical variable reduction procedure that identifies how variables cluster. It is a commonly used statistical technique that transforms a set of correlated variables into a smaller set of derived, uncorrelated variables that retain most of the information in the original set of variables. Principal axis factoring is another common method used for factor extraction.

In this study, the principal component analysis was selected and conducted on the measurement instrument. According to Thompson (1992) as cited by Henson and Roberts (2001), the practical difference between both principal component analysis and principal axis factoring was often negligible in term of interpretation. Differences in results will decrease as the measured variables have greater score on reliability or the number of variables measured increases.

The following five criteria were used in this study to determine the number of factors to be retained:

i. factors with eigenvalues greater than 1.0,
ii. examination of the scree plot,

iii. the magnitude of factor loading scores greater than 0.40,

iv. the presence of correlation with the other resulting factors,

v. the conceptual meaningfulness of the factors (Tabachinick & Fidell, 1996).

The initial principal components analysis of the quality improvement data generated 8 factors with eigenvalues greater than 1 and accounted for 59.2% of the total variance explained by the underlying factors of the SQMS. Item 19 was found as the only variable loaded on the eighth factor whereas several items were also cross loaded highly on two or more factors. A visual inspection of the scree plot indicated a sudden drop in the scree beginning with the seventh factor as depicted in Figure 4.2, hence, only these 7 factors were kept for further analysis.

**Figure 4.2: Scree Plot of Items in SQMS**
In interpretation of the factors, factor structure coefficients (factor loading) were used to describe correlations between each variable in the original variable set and each of the factors that was retained. Only factor structure coefficients of 0.40 or greater were considered to be significant and used to interpret the factors. It is suggested that each factor should have at least three items with significant structure coefficients (Tabachinck & Fidell, 1996). The relationship between the relevant subscales was examined by conducting Pearson correlations among these subscales and significant correlations were observed among these subscales as depicted in Table 4.5.

Table 4.5.

*Correlations Among the Subscales from the Field Data (N=398)*

<table>
<thead>
<tr>
<th>Information and Analysis (IA)</th>
<th>IA</th>
<th>TSP</th>
<th>TMP</th>
<th>SQP</th>
<th>QOR</th>
<th>CFS</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Staff Participation (TSP)</td>
<td>0.70**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top Management Support (TMP)</td>
<td>0.59**</td>
<td>0.53**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Quality Planning (SQP)</td>
<td>0.69**</td>
<td>0.65**</td>
<td>0.66**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Operational Result (QOR)</td>
<td>0.56**</td>
<td>0.50**</td>
<td>0.40**</td>
<td>0.44**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Focus and Satisfaction (CFS)</td>
<td>0.73**</td>
<td>0.73**</td>
<td>0.58**</td>
<td>0.72**</td>
<td>0.46**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Continuous Improvement (CI)</td>
<td>0.76**</td>
<td>0.72**</td>
<td>0.61**</td>
<td>0.69**</td>
<td>0.60**</td>
<td>0.75**</td>
<td>1</td>
</tr>
</tbody>
</table>

** Significant at the 0.01 level.
A second time principal components analysis was conducted on the remaining items except item 19 to extract the optimum variance explained by the underlying factors of the quality management constructs. Further principal components analysis was carried out to discard items that were cross loaded highly on two or three factors so that the seven-factor model was retained and the total variance accounted by the factors was slightly increased to over 60%.

Item content was examined for each factor to see if an underlying theme was identifiable. It was decided that the first 7 factors were conceptually meaningful and had greatest conceptual clarity in describing quality improvement strategies in school management. Therefore, they were retained in the final instrument. These 7 factors accounted for 61.26% of the total variance.

The first factor accounted for 40.68% of the variance for the quality management constructs and appeared to focus primarily on information and analysis. The second factor accounted for 5.04% of the variance that seemed most related to total staff participation. The third factor accounted for 4.28% of the variance and was most related to top management support. The forth factor accounted for 3.42% of the variance and was associated with strategic quality planning. The fifth factor accounted for 2.95% of the variance that seems most related to operational results. The sixth factor accounted for 2.49% of the variance and focused primarily on customer focus and satisfaction. The seventh factor accounted for 2.41% of the variance and was most related to continuous improvement.
Factor 1 primarily contained items pertaining to information and analysis. The highest loading item on this factor and its loading were:

Item 28: The school focuses on using data and analysis of results to make decision. Factor loading was 0.74.

Factor 2 primarily contained items relating to total staff participation. The highest loading item on this factor and its loading were:

Item 24: Teacher satisfaction surveys are conducted on a regular basis. Factor loading was 0.68.

Factor 3 primarily contained items pertaining to top management support. The highest loading item on this factor and its loading were:

Item 3: Top management is actively promoting quality within the school system. Factor loading was 0.80.

Factor 4 primarily contained items associating with strategic quality planning. The highest loading item on this factor and its loading were:

Item 9: Teachers at all levels know how they can contribute to the school success. Factor loading was 0.64.

Factor 5 primarily contained items pertaining to quality and operational results. The highest loading item on this factor and its loading were:

Item 48: The school has achieved excellent result and won award in co-curriculum competition outside the school. Factor loading was 0.76.
Factor 6 primarily contained items relating to customer focus and satisfaction. The highest loading item on this factor and its loading were:

Item 15: Information from students and parents is gathered frequently to monitor progress and improvement from year to year. Factor loading was 0.59.

Factor 7 primarily contained items pertaining to continuous improvement. The highest loading item on this factor and its loading were:

Item 44: Continuous improvement is the objective for all teachers, staff, students and parents. Factor loading was 0.67.

Eight items (26, 27, 28, 29, 30, 31, 32, 33) loaded solely on the first factor (Information and Analysis), Six items (20, 21, 22, 24, 25, 39) on the second factor (Total Staff Participation), five items (1, 2, 3, 4, 5) on the third factor (Top Management Support), Six items (7, 8, 9, 10, 11, 12) loaded solely on the fourth factor (Strategic Quality Planning), Five items (35, 46, 47, 48, 49) on the fifth factor (Quality and Operational Result), Six items (13, 14, 15, 16, 17, 18) on the sixth factor (Customer Focus and Satisfaction), and Six items (37, 41, 42, 43, 44, 45) loaded on seventh factor (Continuous Improvement).

The factor loading criterion of 0.40 or higher was used in this study for factors extraction. Eight other items (6, 19, 23, 34, 36, 38, 40 and 50) did not load on any of the factors at this criterion level. Item 19 was eliminated because it loaded negatively on a single factor whereas the other seven items did not load highly on any of the factors or cross loaded quite highly into two
to three factors. These resulted only 42 items were retained in the original 50-item School Quality Management Scale after performing a thorough examination on the item-factor loading and the reliability coefficient.

This remaining 42 viable items categorized into seven components or constructs of the Quality Management Practices. These seven components were labeled as:

i. Information and Analysis (alpha = 0.90; 8 items, e.g., "The school encourages teachers to use data to develop solutions to current problems"),

ii. Total Staff Participation (alpha = 0.84; 6 items, e.g., "Empowerment, risk taking and innovation are encouraged and supported"),

iii. Top Management Support (alpha = 0.86; 5 items, e.g., "Top management regularly communicates the quality standards to all the teachers"),

iv. Strategic Quality Planning (alpha = 0.85; 6 items, e.g., "Information from teachers and the community is used for strategic planning"),

v. Quality and Operational Results (alpha = 0.79; 5 items, e.g., "The quality of the school is compared regularly with programs, results and performance of other schools"),

vi. Customer Focus and Satisfaction (alpha = 0.84; 6 items, e.g., "The school has well-established procedures for handling inquiries and complaints"),
vii. Continuous Improvement (alpha = 0.87; 6 items, e.g., “The school has adopted a continuous improvement process that is supported by all staff”).

Table 4.6 presents the item list each of the 7 sub-scales or dimensions of the Quality Management Practices in this study based on the result of principal component analysis.

Table 4.6.

Seven Dimensions of Quality Management

<table>
<thead>
<tr>
<th>Sub-scales/ Dimensions</th>
<th>Item List</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and Analysis</td>
<td>26,27,28,29,30,31,32,33</td>
<td>8</td>
</tr>
<tr>
<td>Total Staff Participation</td>
<td>20,21,22,24,25,39</td>
<td>6</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>1,2,3,4,5</td>
<td>5</td>
</tr>
<tr>
<td>Strategic Quality Planning</td>
<td>7,8,9,10,11,12</td>
<td>6</td>
</tr>
<tr>
<td>Quality and Operational Result</td>
<td>35,46,47,48,49</td>
<td>5</td>
</tr>
<tr>
<td>Customer Focus and Satisfaction</td>
<td>13,14,15,16,17,18</td>
<td>6</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>37,41,42,43,44,45</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 4.7a-4.7g show the factor loading of all the forty two items from the seven components in the SQMS obtained from the factor analysis. Eigenvalues, cumulative variance explained by each individual factor and Cronbach’s Coefficient Alphas were also presented.
Table 4.7a.

**Factor Analysis: Factor Loadings of Quality Management Practices and Cronbach's Coefficient Alphas for Factor 1.**

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1 *</th>
</tr>
</thead>
<tbody>
<tr>
<td>The school focuses on using data and analysis of results to make decisions.</td>
<td>0.74</td>
</tr>
<tr>
<td>The school seldom collects data and information to determine the quality of its services.</td>
<td>0.70</td>
</tr>
<tr>
<td>The school's use of data reflects teacher commitment to quality.</td>
<td>0.66</td>
</tr>
<tr>
<td>The school encourages teachers to use data to develop solutions to current problems</td>
<td>0.66</td>
</tr>
<tr>
<td>The school regularly updates and maintains a current and accurate information database.</td>
<td>0.61</td>
</tr>
<tr>
<td>Data are used to improve course content, subject package and schedules.</td>
<td>0.56</td>
</tr>
<tr>
<td>Key programs and activities of the school are identified and monitored</td>
<td>0.53</td>
</tr>
<tr>
<td>The quality of processes and services is compared with those other school systems.</td>
<td>0.51</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>17.09</td>
</tr>
<tr>
<td>Percentage of Variance (%)</td>
<td>40.68</td>
</tr>
<tr>
<td>Cumulative Variance (%)</td>
<td>40.68</td>
</tr>
<tr>
<td>Cronbach's Coefficient alpha</td>
<td>0.90</td>
</tr>
</tbody>
</table>

* Factor 1: Information and Analysis
Table 4.7b.


<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 2 *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher satisfaction surveys are conducted on a regular basis.</td>
<td>0.68</td>
</tr>
<tr>
<td>Empowerment, risk taking and innovation are encouraged and support.</td>
<td>0.68</td>
</tr>
<tr>
<td>Before additional responsibilities are assigned, teachers are provided with the relevant training.</td>
<td>0.67</td>
</tr>
<tr>
<td>The school has a process for regularly reviewing individual training and development needs for each teacher.</td>
<td>0.59</td>
</tr>
<tr>
<td>Quality awareness training is made available to all teachers on a regular basis.</td>
<td>0.57</td>
</tr>
<tr>
<td>Teacher teams are regularly used to solve school problems and manage processes.</td>
<td>0.52</td>
</tr>
</tbody>
</table>

---

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>2.12</td>
</tr>
<tr>
<td>Percentage of Variance (%)</td>
<td>5.04</td>
</tr>
<tr>
<td>Cumulative Variance (%)</td>
<td>45.72</td>
</tr>
<tr>
<td>Cronbach’s Coefficient alpha</td>
<td>0.84</td>
</tr>
</tbody>
</table>

* Factor 2: Total Staff Participation
Table 4.7c.


<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 3 *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management is actively promoting quality within the school system</td>
<td>0.80</td>
</tr>
<tr>
<td>Top Management regularly communicates the quality standards to all the teachers.</td>
<td>0.80</td>
</tr>
<tr>
<td>Top Management has established quality standards for every school process.</td>
<td>0.70</td>
</tr>
<tr>
<td>Top management is committed to improving quality.</td>
<td>0.65</td>
</tr>
<tr>
<td>Top Management provides information on latest development in quality practices to all teachers.</td>
<td>0.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Eigenvalue</th>
<th>Percentage of Variance (%)</th>
<th>Cumulative Variance (%)</th>
<th>Cronbach’s Coefficient alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.80</td>
<td>4.28</td>
<td>50.00</td>
<td>0.86</td>
</tr>
</tbody>
</table>

* Factor 3: Top Management Support
Table 4.7d.


<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 4 *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers at all levels know how they can contribute to the school success.</td>
<td>0.64</td>
</tr>
<tr>
<td>Information from teachers and community is used for strategic planning.</td>
<td>0.61</td>
</tr>
<tr>
<td>The school planning process involves all administrative, academic and support areas.</td>
<td>0.59</td>
</tr>
<tr>
<td>The school has developed a strategic plan which is implemented and updated regularly.</td>
<td>0.57</td>
</tr>
<tr>
<td>Continuous improvement is emphasized in strategic planning efforts.</td>
<td>0.55</td>
</tr>
<tr>
<td>Every department has a mission, and has identified key processes and customer needs.</td>
<td>0.47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Percentage of Variance (%)</th>
<th>Cumulative Variance (%)</th>
<th>Cronbach’s Coefficient alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.44</td>
<td>3.42</td>
<td>53.42</td>
<td>0.85</td>
</tr>
</tbody>
</table>

* Factor 4: Strategic Quality Planning
Table 4.7e.


<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 5 *</th>
</tr>
</thead>
<tbody>
<tr>
<td>The school has achieved excellence result and won awards in co-curriculum competition outside the school.</td>
<td>0.76</td>
</tr>
<tr>
<td>The overall performance of the school in public examination has improved compared to the year before.</td>
<td>0.74</td>
</tr>
<tr>
<td>The school has become the priority for the parents when enrolling their children for school.</td>
<td>0.69</td>
</tr>
<tr>
<td>The school has achieved its academic target as estimated for the students throughout the year.</td>
<td>0.62</td>
</tr>
<tr>
<td>The quality of the school is compared regularly with programs, results and performance of other schools.</td>
<td>0.50</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>1.24</td>
</tr>
<tr>
<td>Percentage of Variance (%)</td>
<td>2.95</td>
</tr>
<tr>
<td>Cumulative Variance (%)</td>
<td>56.36</td>
</tr>
<tr>
<td>Cronbach’s Coefficient alpha</td>
<td>0.79</td>
</tr>
</tbody>
</table>

* Factor 5: Quality and Operational Results
Table 4.7f.


<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 6 *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information is gathered to monitor progress and improvement from year to year.</td>
<td>0.59</td>
</tr>
<tr>
<td>The school has well-established procedures for handling inquiries and complaints.</td>
<td>0.55</td>
</tr>
<tr>
<td>The school has developed procedures that enable teacher to quickly respond to customer’s needs.</td>
<td>0.51</td>
</tr>
<tr>
<td>Surveys are regularly used to obtain student and parent feedback.</td>
<td>0.51</td>
</tr>
<tr>
<td>Customer satisfaction with the school’s performance is improving over time</td>
<td>0.46</td>
</tr>
<tr>
<td>Teachers are taught with skills to effectively interact with students and external customers.</td>
<td>0.45</td>
</tr>
</tbody>
</table>

| Eigenvalue | 1.04 |
| Percentage of Variance (%) | 2.49 |
| Cumulative Variance (%)     | 58.85 |
| Cronbach’s Coefficient alpha | 0.84 |

* Factor 6: Customer Focus and Satisfaction
Table 4.7g.


<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous improvement is the objective for all staff students and parents.</td>
<td>0.67</td>
</tr>
<tr>
<td>The school has adopted a continuous improvement process that is supported by all staff.</td>
<td>0.60</td>
</tr>
<tr>
<td>The school has developed quality standards that every teacher, student and parent must meet.</td>
<td>0.47</td>
</tr>
<tr>
<td>Reports and findings about results and performance of the school are shared freely with the teacher, staff, and the community.</td>
<td>0.47</td>
</tr>
<tr>
<td>Quality work and results are the priority for the teachers in the school.</td>
<td>0.46</td>
</tr>
<tr>
<td>The school has implemented a regular review cycle of all programs and services</td>
<td>0.43</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>1.01</td>
</tr>
<tr>
<td>Percentage of Variance (%)</td>
<td>2.41</td>
</tr>
<tr>
<td>Cumulative Variance (%)</td>
<td>61.26</td>
</tr>
<tr>
<td>Cronbach's Coefficient alpha</td>
<td>0.87</td>
</tr>
</tbody>
</table>

* Factor 7: Continuous Improvement
In order to determine whether any of the 42 retained items were problematic, correlations between the response to a particular item and the sum of the responses to all other items were obtained for each of the seven factors or subscales. The item/total correlations ranged from 0.59 to 0.74 for the composite Quality Management practices. The mean and standard deviation of the mean composite score of the SQMS were 3.59 and 0.54 respectively. The standard error of measurement was 0.03. All 42 items had item-to-total correlation above 0.50 with the highest being 0.77. This suggested all the items contributed significantly to the total inventory.

Since the elimination of any one of the items from any of these subscales did not increase the value of Cronbach's alpha for each factor or subscale (see Table 4.7a-4.7g), all of the remaining items from the factor analysis were retained for each subscale.

The final version of the School Quality Management Scale contains 42 items and their factor structure coefficients are presented in appendix. Eigenvalues and percent of total variance explained by each factor are also summarized in Table 4.7a-4.7g.

Table 4.8 summarizes the descriptive statistics for the dependent variables (Quality Management Practices), its sub-scales and the independent variables (Correlates of Quality Management) in this study. The values were calculated from the sample of 398 participating secondary school teachers. The sample contained 106 male and 292 female teachers.
Table 4.8.

_Descriptive Statistics of the Variables (N = 398)_

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>1.79</td>
<td>4.93</td>
<td>3.59</td>
<td>0.54</td>
</tr>
<tr>
<td>School Quality Index</td>
<td>0.36</td>
<td>0.99</td>
<td>0.72</td>
<td>0.10</td>
</tr>
<tr>
<td>Information and Analysis</td>
<td>1.50</td>
<td>5.00</td>
<td>3.58</td>
<td>0.64</td>
</tr>
<tr>
<td>Total Staff Participation</td>
<td>1.33</td>
<td>5.00</td>
<td>3.20</td>
<td>0.72</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>1.60</td>
<td>5.00</td>
<td>3.79</td>
<td>0.67</td>
</tr>
<tr>
<td>Strategic Quality Planning</td>
<td>1.83</td>
<td>5.00</td>
<td>3.72</td>
<td>0.60</td>
</tr>
<tr>
<td>Quality and Operational Result</td>
<td>1.40</td>
<td>5.00</td>
<td>3.71</td>
<td>0.69</td>
</tr>
<tr>
<td>Customer Focus and Satisfaction</td>
<td>1.33</td>
<td>5.00</td>
<td>3.52</td>
<td>0.61</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>1.67</td>
<td>5.00</td>
<td>3.69</td>
<td>0.62</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>1.83</td>
<td>5.00</td>
<td>3.82</td>
<td>0.58</td>
</tr>
<tr>
<td>Transformational Leadership Style</td>
<td>1.17</td>
<td>5.00</td>
<td>3.80</td>
<td>0.71</td>
</tr>
<tr>
<td>Staff Development</td>
<td>1.83</td>
<td>5.00</td>
<td>3.72</td>
<td>0.63</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>1.60</td>
<td>5.00</td>
<td>3.39</td>
<td>0.63</td>
</tr>
<tr>
<td>Years of Teaching</td>
<td>1</td>
<td>33</td>
<td>13.29</td>
<td>7.16</td>
</tr>
</tbody>
</table>

There was no floor or ceiling effect on the SQMS. The distribution of scores for quality management was nearly normal with an average item mean of 3.59. Figure 4.3 shows a stem-and-leaf plot of the mean score of the school quality management practices among secondary school teachers in this study. The range for the mean score of the teachers’ rating on their perception toward the school management was from a score of 1.79 to 4.93. There was
only one teacher with the highest mean score of 4.93 whereas one of them scored the lowest at 1.79. The mean score of the school quality management practices among them was about 3.59. The mode score was 3.74 and there are 11 of them with this score. Forty nine of them (12.3 %) had scores lower than the midpoint value of 3.0.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Stem &amp; Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.00 Extremes</td>
<td>(=&lt;2.1)</td>
</tr>
<tr>
<td>4.00</td>
<td>2 . 23</td>
</tr>
<tr>
<td>7.00</td>
<td>2 . 455</td>
</tr>
<tr>
<td>10.00</td>
<td>2 . 677</td>
</tr>
<tr>
<td>25.00</td>
<td>2 . 88888999999</td>
</tr>
<tr>
<td>41.00</td>
<td>3 . 0000000000111111111</td>
</tr>
<tr>
<td>54.00</td>
<td>3 . 2222222223333333333333333</td>
</tr>
<tr>
<td>56.00</td>
<td>3 . 444444444445555555555555</td>
</tr>
<tr>
<td>59.00</td>
<td>3 . 6666666666677777777777777</td>
</tr>
<tr>
<td>52.00</td>
<td>3 . 888888888899999999999999</td>
</tr>
<tr>
<td>39.00</td>
<td>4 . 0000000000111111111</td>
</tr>
<tr>
<td>20.00</td>
<td>4 . 222222333</td>
</tr>
<tr>
<td>12.00</td>
<td>4 . 444455</td>
</tr>
<tr>
<td>13.00</td>
<td>4 . 666677</td>
</tr>
<tr>
<td>3.00</td>
<td>4 . 9&amp;</td>
</tr>
</tbody>
</table>

Stem width: 1.00
Each leaf: 2 case(s)
& denotes fractional leaves.

*Figure 4.3: School Quality Management Practices (Stem-and-Leaf Plot)*

Meanwhile, the calculated School Quality Index (SQI) was found to be ranged from 0.36 to 0.99 and the mean score SQI was 0.72 with a standard deviation of 0.11. This value was approximately 28% of the way toward to the ideal level of quality management and indicating ample room for quality improvement strategies. The result of SQI also revealed about 57.8% of the respondents had scored above 0.7 in the School Quality Index.
4.4 Evidence of Reliability

Reliability refers to the degree of dependability, consistency or stability of a scale. Reliability of the survey instrument was established by calculating Cronbach’s alpha coefficient which was one of the most commonly used indicators to measure the internal consistency of the survey scale. Cronbach’s alpha was computed for the entire School Quality Management Scale, as well as each factor generated from the principle components analysis.

Results showed that the reliability coefficient for the entire SQMS instrument was 0.96, indicating a high degree of internal consistency for group analyses. The Cronbach’s alpha for the individual 7 factors or subscales ranged from 0.79 to 0.90. According to Nunnally (1967), an ideal reliability coefficient is 0.80 or 0.90, but correlations in educational research tend to be smaller, so 0.70 is deemed acceptable in the present study. All reliability coefficients in this study were higher than 0.70. The item/total correlations for all the seven subscales in the SQMS ranged from 0.36 to 0.75 with majority of the item/total correlations fell between 0.50 and 0.60. As a result, the instrument in this study, that is, the SQMS was judged to be internally consistent and therefore reliable.

Table 4.9 shows the Cronbach’s alphas (reliability coefficient) of the measurement instrument of the present study. All of the reliability coefficients of the School Quality Management Scale were above 0.70 and were within the range generally considered acceptable for educational and behavioral research.
Table 4.9  

Results of Reliability of the Measurement Instrument  

<table>
<thead>
<tr>
<th>Scales</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>3.59</td>
<td>0.54</td>
<td>0.96</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>3.82</td>
<td>0.58</td>
<td>0.83</td>
</tr>
<tr>
<td>Transformational Leadership Style</td>
<td>3.80</td>
<td>0.71</td>
<td>0.91</td>
</tr>
<tr>
<td>Staff Development</td>
<td>3.72</td>
<td>0.63</td>
<td>0.86</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>3.39</td>
<td>0.63</td>
<td>0.81</td>
</tr>
</tbody>
</table>

For the test-retest reliability, the original SQMS was administered to a sub-sample of 50 respondents from the original sample of 398 in this study after five months from the first field study. But only data for the final 42 items was used to establish the test-retest reliability. Correlations between the quality rating between the sub-sample and the origin sample on the 42-item quality management practices score were analyzed to examine the stability of the instrument.

A significant correlation of 0.90 was established between mean scores of the quality management and this indicated a strong positive correlation. The individual mean scores of the 7 component of the quality management were also examined for the test-retest reliability and they were all found to be significantly correlated at a range from 0.57 to 0.86 as depicted in Table 4.10. This result indicated stability of the SQMS and the subscales over a period of
five months. These data indicated that the SQMS and the subscale is a reliable scale and is stable over time.

Table 4.10.

*Results of Reliability of the SQMS (42 items)*

<table>
<thead>
<tr>
<th>Instrument/ Components</th>
<th>Internal Consistency Cronbach’s Alpha</th>
<th>Stability (Test-Retest) Pearson r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>0.96</td>
<td>0.89**</td>
</tr>
<tr>
<td>Information and Analysis</td>
<td>0.90</td>
<td>0.74**</td>
</tr>
<tr>
<td>Total Staff Participation</td>
<td>0.84</td>
<td>0.86**</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>0.86</td>
<td>0.74**</td>
</tr>
<tr>
<td>Strategic Quality Planning</td>
<td>0.85</td>
<td>0.68**</td>
</tr>
<tr>
<td>Quality and Operational Result</td>
<td>0.79</td>
<td>0.57**</td>
</tr>
<tr>
<td>Customer Focus and Satisfaction</td>
<td>0.84</td>
<td>0.81**</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>0.87</td>
<td>0.80**</td>
</tr>
</tbody>
</table>

** Correlation is significant at the .001 level (2-tailed)

The Pearson correlation coefficient was used for examining the criterion-related validity. The mean score of quality management practices was correlated with the quality performance achieved. The quality performance scale is measured from the achievement of the school in academics, co-curriculum, satisfaction and efficiency. The quality management practice was correlated with the mean scores of the quality performance. A significant correlation coefficient of 0.69 was obtained
between the two mean scores. Generally, a correlation coefficient of more than 0.6 was accepted and thus, the SQMS also exhibit criterion related validity.

The Pearson correlation coefficient was conducted on the four determinants of TQM used in this study. Positive and significant correlations were found between the four determinants of TQM as shown in Table 4.11. The strongest positive correlation of 0.74 was found between the Leadership Style subscale and the Staff Development subscale. The weakest positive correlation of 0.59 was found between the Leadership Style subscale and the Organizational Structure subscale.

Table 4.11.

*Correlations Among the Determinants of TQM (N=398)*

<table>
<thead>
<tr>
<th></th>
<th>Organizational Culture</th>
<th>Leadership Style</th>
<th>Staff Development</th>
<th>Organizational Structure</th>
<th>Quality Management Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Culture</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership Style</td>
<td>0.69**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Development</td>
<td>0.74**</td>
<td>0.74**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>0.61**</td>
<td>0.59**</td>
<td>0.67**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Quality Management Practices</td>
<td>0.71**</td>
<td>0.69**</td>
<td>0.75**</td>
<td>0.68**</td>
<td>1</td>
</tr>
</tbody>
</table>

** Significant at the 0.01 level.
The Pearson correlation coefficient was also conducted between all the seven subscales of the SQMS. Positive and significant correlation was found between the seven subscales of quality management constructs. The strongest positive correlation of 0.76 was found between the Continuous Improvement subscale and the Information and Analysis subscale. Positive and significant correlations were also found between the seven subscales and the composite quality management practices. The two strongest correlations were the Continuous Improvement subscale \( (r = 0.89) \) and the Information and Analysis subscale \( (r = 0.87) \) respectively. This result indicated that the Continuous Improvement subscale and the Information and Analysis subscale were found to have the strongest correlation on the school quality management practices.

The relationship between the determinants of TQM and the Quality Management Practices were examined by using Pearson correlation coefficient. Positive and significant correlation was found between Organizational Culture, Leadership Style, Staff Development, Organizational Structure and the composite Quality Management Practices. The Pearson correlation coefficient between the subscales of the SQMS, determinants of TQM and the composite quality management constructs were depicted in Table 4.12. The strongest positive correlation of 0.72 was found between the Continuous Improvement subscale and the Staff Development subscale. The Staff Development subscale indicated a positive correlation of 0.75 which was found to be the highest between the four determinants of TQM and the composite Quality Management Practices.
Table 4.12.

*Pearson Correlation Coefficient from the Field Data ( N=398 )*

<table>
<thead>
<tr>
<th></th>
<th>Quality Management Practices</th>
<th>Organizational Culture</th>
<th>Leadership Style</th>
<th>Staff Development</th>
<th>Organizational Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and Analysis</td>
<td>0.89** ( p &lt; 0.01 )</td>
<td>0.60** ( p &lt; 0.01 )</td>
<td>0.58** ( p &lt; 0.01 )</td>
<td>0.65** ( p &lt; 0.01 )</td>
<td>0.61** ( p &lt; 0.01 )</td>
</tr>
<tr>
<td>Total Staff Participation</td>
<td>0.85** ( p &lt; 0.01 )</td>
<td>0.61** ( p &lt; 0.01 )</td>
<td>0.56** ( p &lt; 0.01 )</td>
<td>0.64** ( p &lt; 0.01 )</td>
<td>0.58** ( p &lt; 0.01 )</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>0.74** ( p &lt; 0.01 )</td>
<td>0.43** ( p &lt; 0.01 )</td>
<td>0.52** ( p &lt; 0.01 )</td>
<td>0.51** ( p &lt; 0.01 )</td>
<td>0.48** ( p &lt; 0.01 )</td>
</tr>
<tr>
<td>Strategic Quality Planning</td>
<td>0.84** ( p &lt; 0.01 )</td>
<td>0.58** ( p &lt; 0.01 )</td>
<td>0.54** ( p &lt; 0.01 )</td>
<td>0.60** ( p &lt; 0.01 )</td>
<td>0.53** ( p &lt; 0.01 )</td>
</tr>
<tr>
<td>Quality and Operational Result</td>
<td>0.68** ( p &lt; 0.01 )</td>
<td>0.54** ( p &lt; 0.01 )</td>
<td>0.45** ( p &lt; 0.01 )</td>
<td>0.54** ( p &lt; 0.01 )</td>
<td>0.52** ( p &lt; 0.01 )</td>
</tr>
<tr>
<td>Customer Focus and Satisfaction</td>
<td>0.86** ( p &lt; 0.01 )</td>
<td>0.62** ( p &lt; 0.01 )</td>
<td>0.66** ( p &lt; 0.01 )</td>
<td>0.63** ( p &lt; 0.01 )</td>
<td>0.57** ( p &lt; 0.01 )</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>0.89** ( p &lt; 0.01 )</td>
<td>0.68** ( p &lt; 0.01 )</td>
<td>0.66** ( p &lt; 0.01 )</td>
<td>0.72** ( p &lt; 0.01 )</td>
<td>0.64** ( p &lt; 0.01 )</td>
</tr>
<tr>
<td>Quality Management Practices</td>
<td>1.00</td>
<td>0.71** ( p &lt; 0.01 )</td>
<td>0.69** ( p &lt; 0.01 )</td>
<td>0.75** ( p &lt; 0.01 )</td>
<td>0.68** ( p &lt; 0.01 )</td>
</tr>
</tbody>
</table>

** Significant at the 0.01 level.
* Significant at the 0.05 level.

The result of t-tests on gender and excellence award winning schools with mean composite score of the quality management constructs as the dependent variable is presented in Table 4.13. No significant difference was observed in the levels of quality rating among the male teachers and female teachers (t-value = -0.93, p = 0.35). Significant difference was observed in the
levels of quality rating among teachers from excellence award winning schools and the non-award winning schools ($t$-value = -9.56, $p < 0.01$). Excellence award winning school teachers appeared to have higher quality rating than their counterparts who are in the non-award winning schools. While no significant difference was observed in the quality rating between urban and rural school teachers ($t$-value = 1.14, $p = 0.25$).

Table 4.13.

t-test on Award Winning Schools, Gender and school Location with School Quality Rating

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>106</td>
<td>3.55</td>
<td>0.57</td>
<td>-0.93</td>
</tr>
<tr>
<td>Female</td>
<td>292</td>
<td>3.61</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Excellence Award:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-winner</td>
<td>267</td>
<td>3.43</td>
<td>0.50</td>
<td>-9.56**</td>
</tr>
<tr>
<td>Winner</td>
<td>131</td>
<td>3.92</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>School Location:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suburb</td>
<td>85</td>
<td>3.61</td>
<td>0.56</td>
<td>1.14</td>
</tr>
<tr>
<td>Urban</td>
<td>313</td>
<td>3.53</td>
<td>0.46</td>
<td></td>
</tr>
</tbody>
</table>

** Significant at the 0.01 level.

Preliminary analyses using the one-way analysis of variance (ANOVA) were conducted to compare the responses of demographic groups. The one-way ANOVA was used to determine differences between the three ethnic groups, three academic qualification of teacher and three teaching subjects.
The results from ANOVA revealed no significant difference in mean score of the seven quality management constructs and the composite Quality Management practices among the ethnic groups, academic qualification of teacher and teaching subjects. Significant differences ($F = 9.81, p < 0.01$) were found between the three groups of teachers who had attended TQM courses either none, one time and twice or above. Whereas significant difference ($F = 4.20, p < 0.05$) was found between the post held by the respondents. The post-hoc test indicated only significant mean difference of 0.30 at $p < 0.05$ between the senior assistants and the teachers while there was no significant mean difference between other groups of teachers.

In short, the results from principal component analysis, reliability analysis, Pearson correlation analysis, $t$ test and ANOVA have revealed evidences and indicated a need for conducting an initial application study to examine the efficacy of the instrument, SQMS.

4.5 Phase II: Initial Application of SQMS

After the validity and reliability analysis as discussed in Phase I of this study, the refined SQMS was used in Phase II of this study to analyze the initial application of the instrument as well as to examine the efficacy of SQMS in measuring the quality improvement of the school management. The final version of the SQMS that contained 42 items in the seven quality management constructs were administered to 3 excellence award winning schools and 3 non-award winning schools. The excellence awards were based on the competition organized by the State Education Department on
various aspects, such as, curriculum, co-curriculum, public examination, creativity and innovation, landscape and cleanliness,

This section describes the analysis techniques employed in the initial application study and it is divided into three main sections. The first section examines the summaries of characteristics of the respondents in the initial application study. The psychometric properties of the measurement scales used in initial application study are reported in the second section. Findings concerning the substantive research questions of the initial application study are discussed in the last section together with the results of the data analysis.

A total of 120 sets of the final version of SQMS, together with the demographic profile and four independent variables scale for the quality management constructs were distributed to the teachers of these six schools through their senior assistants. 95 sets of the questionnaires were collected back yielding a response rate of 79.2% and 4 questionnaires were discarded because there were either non-responses, unintentional omissions or unidentifiable marks on some items of the survey. The remaining 91 questionnaires were found to be complete. Data collected through the consolidated questionnaires was analyzed using the SPSS software as in Phase I.

4.5.1 Analysis of Respondents’ Characteristics

The number of teachers who participated in this study was 50 from award winning schools and 41 from non-award winning schools
respectively. The demographic characteristics of the respondents were summarized and shown in Table 4.14. 71.4% or a total of 65 of the teachers that participated in this study were females, of which 29.7% was from award winning schools while 41.8% was from non-award winning schools. Meanwhile, a total of 26 male teachers made up 28.6% of the respondents in the sample, in which 15.4% was from award winning schools and followed by 13.2% from non-award winning schools.

Table 4.14.

*Gender of Respondents (N=91)*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Non-Award Winner</th>
<th>Award Winner</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12</td>
<td>14</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>13.2%</td>
<td>15.4%</td>
<td>28.6%</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>27</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>41.8%</td>
<td>29.7%</td>
<td>71.4%</td>
</tr>
<tr>
<td>Total</td>
<td>50 (54.9%)</td>
<td>41 (45.1%)</td>
<td>91 (100%)</td>
</tr>
</tbody>
</table>

Out of the 91 respondents in this initial application study, 92.3% or a total of 84 of the respondents were teachers, 2 of them were senior teachers whereas 5 of them were senior assistants as depicted in Table 4.15.
Table 4.15.

*Post of Respondents (N=91)*

<table>
<thead>
<tr>
<th>Post</th>
<th>Schools</th>
<th>Non-Award Winner</th>
<th>Award Winner</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td></td>
<td>45</td>
<td>39</td>
<td>84 (92.3%)</td>
</tr>
<tr>
<td>Senior Teacher</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2 (2.2%)</td>
</tr>
<tr>
<td>Senior Assistant</td>
<td></td>
<td>4</td>
<td>1</td>
<td>5 (5.5%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>50 (54.9%)</strong></td>
<td><strong>41 (45.1%)</strong></td>
<td><strong>91 (100%)</strong></td>
</tr>
</tbody>
</table>

The main objective of this initial application study is to gain some sense of the incidence of quality management practices and strategies as perceived by the secondary school teachers in both the award winning schools and non-award winning schools. The final version of the SQMS that contained 42 items in the seven quality management constructs were administered to 3 excellence award winning schools and 3 non-award winning schools for this purpose.

Table 4.16 summarizes the descriptive statistics for Quality Management Practices, School Quality Index and Quality Performance between the award winning and the non-award winning schools in this initial application study. The statistics revealed the ratings perceived by the teachers in the above two categories of schools.
Table 4.16.  
*Descriptive Statistics of the Variables (N = 91)*

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Non-Award Winner</th>
<th>Award Winner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum Value</td>
<td>Maximum Value</td>
</tr>
<tr>
<td>Quality Management Practices</td>
<td>1.79</td>
<td>4.74</td>
</tr>
<tr>
<td>School Quality Index</td>
<td>0.36</td>
<td>0.95</td>
</tr>
<tr>
<td>Quality Performance</td>
<td>1.75</td>
<td>5.00</td>
</tr>
</tbody>
</table>

Of the 91 teachers who participated in this application study, only 9 (18%) respondents from the non-award winning school had mean score above 4 in the quality management practices as compared to 17 (41.5%) respondents from the award winning school that had mean score above 4. While 21 out of 50 respondents (42%) from the non-award winning school had School Quality Index above 0.7 whereas 34 out of 41 respondents (82.9%) from the award winning school that had School Quality Index above 0.7.

Within the context of the above interpretation, it is clear from the present data that the result indicated higher mean score of quality rating and School Quality Index were observed in the award winning schools as compared to the non-award winning school because the
award winners were judged as having higher quality in academic or co-
curricular achievements. The finding tentatively suggests that the
SQMS is a valid and reliable instrument in measuring quality
improvement, and quality management practices.

Figure 4.4 shows a stem-and-leaf plot of the mean score of
quality management practices among school teachers in this
application study. The range for the quality management practices is
from a mean score of 1.79 to 4.79. The mean score of the quality
management practices among them is about 3.65 with a standard
deviation of 0.59.

```
Frequency  Stem & Leaf
1.00        Extremes  (<=1.8)
2.00        2 . 14
4.00        2 . 5689
30.00       3 . 00000011112222333333444444
28.00       3 . 55555566666666777777889999
16.00       4 . 000111112222233
10.00       4 . 5556667777
```

Figure 4.4: School Quality Management Practices (Stem-and-Leaf Plot)

### 4.5.2 Reliability of the Measurement Instrument

The reliability coefficient, Cronbach’s alpha, was used to check
for internal consistency and the reliability of the SQMS in this
application study. Data obtained from the 91 teachers in this study
were analyzed to provide information on the actual reliability of the
instrument. The reliability for School Quality Management Scale or SQMS was as high as 0.97 and this result strengthens the findings of this application study as a valid and reliable instrument for measuring the quality management practices and strategies. The reliabilities of Organizational Culture, Staff Development and Leadership Style scales were 0.84, 0.88 and 0.94 respectively and they were considered high and good. Cronbach’s alphas of Organizational Structure instruments is found to be moderate, that is, 0.75.

Table 4.17 shows the Cronbach’s alphas of the measurement instrument of this application study. All of the reliability coefficients are within the range generally considered acceptable for behavioral research.

Table 4.17.

*Results of Reliability of the Measurement Scale (N=91)*

<table>
<thead>
<tr>
<th>Scales</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>3.65</td>
<td>0.59</td>
<td>0.97</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>3.88</td>
<td>0.59</td>
<td>0.84</td>
</tr>
<tr>
<td>Transformational Leadership Style</td>
<td>3.92</td>
<td>0.73</td>
<td>0.94</td>
</tr>
<tr>
<td>Staff Development</td>
<td>3.74</td>
<td>0.69</td>
<td>0.88</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>3.53</td>
<td>0.61</td>
<td>0.75</td>
</tr>
</tbody>
</table>
The internal consistency of the seven sub-scales of Quality Management constructs was determined by calculating the Cronbach’s Coefficient Alpha as depicted in Table 4.18. For the seven factors, the alphas are ranged from 0.79 to 0.91 respectively with Quality and Operational Result being the lowest and the highest was Information and Analysis. However, for the overall SQMS, it is found to have a Cronbach’s Coefficient alpha of 0.97. This value is well above the generally acceptable threshold value of reliability alpha of 0.70 for behavioral research (Hair, et al., 1992).

Table 4.18.

Comparison of Reliability of the Original and Final Version of SQMS

<table>
<thead>
<tr>
<th>Instrument/ Components</th>
<th>Cronbach’s Alpha Original SQMS (50 Items)</th>
<th>Cronbach’s Alpha Final Version SQMS (42 Items)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>0.96</td>
<td>0.97</td>
</tr>
<tr>
<td>Subscales:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information and Analysis</td>
<td>0.90</td>
<td>0.91</td>
</tr>
<tr>
<td>Total Staff Participation</td>
<td>0.84</td>
<td>0.90</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>0.86</td>
<td>0.88</td>
</tr>
<tr>
<td>Strategic Quality Planning</td>
<td>0.85</td>
<td>0.84</td>
</tr>
<tr>
<td>Quality and Operational Result</td>
<td>0.79</td>
<td>0.79</td>
</tr>
<tr>
<td>Customer Focus and Satisfaction</td>
<td>0.84</td>
<td>0.87</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>0.87</td>
<td>0.86</td>
</tr>
</tbody>
</table>
4.5.3 Relationship among the Sub-scales of Quality Management Practices

The relationship among the seven sub-scales of Quality Management constructs was examined using Pearson Correlation analysis. Scores of the seven sub-scales of Quality Management constructs were found to be significantly inter-correlated at the 0.01 level. The correlation between information & analysis and continuous improvement was highest with $r = 0.88$ and the lowest correlation coefficient of $r = 0.53$ was between operational results and customer focus & satisfaction.

All the seven sub-scales of quality management practices were positively correlated and their relationship was found to be significant as depicted in Table 4.19. The subscale Continuous Improvement was found to have the highest positive significant correlation with the composite Quality Management Practice, that is $r = 0.93$. This was followed closely by subscale Information and Analysis with a positive correlation of $r = 0.92$ at the 0.01 significant level. The lowest significant correlation among the subscales with the composite Quality Management Practice was found to be the subscale Operational Results revealing a positive correlation of $r = 0.74$.

Positive correlations were also established at 0.01 significance level between the five independent variables and the composite Quality Management Practices. Thus, the determinants of the total quality
management were found to have positive relationship with the quality management practices.

Table 4.19.

*Pearson Correlation in Sub-scales of Quality Management Practices (N=91)*

<table>
<thead>
<tr>
<th>Sub-Scales</th>
<th>IA</th>
<th>TSP</th>
<th>TMS</th>
<th>SQP</th>
<th>QOR</th>
<th>CFS</th>
<th>CI</th>
<th>QMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and Analysis (IA)</td>
<td>1.00</td>
<td>0.74*</td>
<td>0.62*</td>
<td>0.75*</td>
<td>0.64*</td>
<td>0.81*</td>
<td>0.88*</td>
<td>0.92*</td>
</tr>
<tr>
<td>Total Staff Participation (TSP)</td>
<td>0.74*</td>
<td>1.00</td>
<td>0.60*</td>
<td>0.69*</td>
<td>0.58*</td>
<td>0.70*</td>
<td>0.82*</td>
<td>0.87*</td>
</tr>
<tr>
<td>Top Management Support (TMS)</td>
<td>0.62*</td>
<td>0.60*</td>
<td>1.00</td>
<td>0.73*</td>
<td>0.54*</td>
<td>0.59*</td>
<td>0.67*</td>
<td>0.78*</td>
</tr>
<tr>
<td>Strategic Quality Planning (SQP)</td>
<td>0.75*</td>
<td>0.69*</td>
<td>0.73*</td>
<td>1.00</td>
<td>0.55*</td>
<td>0.74*</td>
<td>0.76*</td>
<td>0.87*</td>
</tr>
<tr>
<td>Quality and Operational Result (QOR)</td>
<td>0.64*</td>
<td>0.58*</td>
<td>0.54*</td>
<td>0.55*</td>
<td>1.00</td>
<td>0.53*</td>
<td>0.64*</td>
<td>0.74*</td>
</tr>
<tr>
<td>Customer Focus and Satisfaction (CFS)</td>
<td>0.81*</td>
<td>0.70*</td>
<td>0.59*</td>
<td>0.74*</td>
<td>0.53*</td>
<td>1.00</td>
<td>0.75*</td>
<td>0.86*</td>
</tr>
<tr>
<td>Continuous Improvement (CI)</td>
<td>0.88*</td>
<td>0.82*</td>
<td>0.67*</td>
<td>0.76*</td>
<td>0.64*</td>
<td>0.75*</td>
<td>1.00</td>
<td>0.93*</td>
</tr>
<tr>
<td>Quality Management Practices (QMP)</td>
<td>0.92*</td>
<td>0.87*</td>
<td>0.78*</td>
<td>0.87*</td>
<td>0.74*</td>
<td>0.86*</td>
<td>0.93*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.01 level*
4.5.4 Difference Between Award Winners and Non-award Winners

$t$-tests of independent sample were used to investigate the mean difference between excellence award winning schools and non-award winning schools with the individual Quality Management constructs as well as the composite Quality Management Practices and School Quality Index.

The result of $t$-tests on excellence award winners and non-award winner with mean score of the seven quality management constructs, quality performance, School Quality Index and the composite Quality Management Practices as the dependent variable is presented in Table 4.20. All the $t$-tests revealed significant difference in the seven quality management constructs, quality performance, School Quality Index and the composite Quality Management Practices among excellence award winning schools and the non-award winning schools. Excellence award winning school teachers appeared to have higher quality rating than their counterparts who were in the non-award winning schools in all the seven quality management constructs, quality performance, School Quality Index and the composite Quality Management Practices.

When $t$-tests were conducted on gender and school location with mean score of the seven quality management constructs, quality performance and the composite Quality Management Practices as the dependent variable, all the $t$-tests revealed no significant difference in
the seven quality management constructs, quality performance and the composite Quality Management Practices among gender and school

Table 4.20.

*t- tests Between Award Winning and Non-award Winning Schools (N=91)*

<table>
<thead>
<tr>
<th>Components</th>
<th>Mean Award Winner</th>
<th>Mean Non-Award Winner</th>
<th>t - value</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>3.87</td>
<td>3.47</td>
<td>3.37</td>
<td>&lt; 0.01**</td>
</tr>
<tr>
<td>Information and Analysis</td>
<td>3.88</td>
<td>3.46</td>
<td>3.02</td>
<td>&lt; 0.01**</td>
</tr>
<tr>
<td>Total Staff Participation</td>
<td>3.54</td>
<td>3.03</td>
<td>3.25</td>
<td>&lt; 0.01**</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>4.14</td>
<td>3.57</td>
<td>4.08</td>
<td>&lt; 0.01**</td>
</tr>
<tr>
<td>Strategic Quality Planning</td>
<td>3.95</td>
<td>3.66</td>
<td>2.22</td>
<td>0.03*</td>
</tr>
<tr>
<td>Quality and Operational Result</td>
<td>3.92</td>
<td>3.59</td>
<td>2.34</td>
<td>0.02*</td>
</tr>
<tr>
<td>Customer Focus and Satisfaction</td>
<td>3.77</td>
<td>3.45</td>
<td>2.28</td>
<td>0.03*</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>3.94</td>
<td>3.58</td>
<td>2.72</td>
<td>0.01**</td>
</tr>
<tr>
<td>School Quality Index</td>
<td>0.77</td>
<td>0.69</td>
<td>3.37</td>
<td>&lt; 0.01**</td>
</tr>
<tr>
<td>Quality Performance</td>
<td>3.96</td>
<td>3.56</td>
<td>2.85</td>
<td>0.01**</td>
</tr>
</tbody>
</table>

** Significant at the 0. 01 level.
* Significant at the 0. 05 level.

4.5.5 Regression Analysis

In the Multiple Regression Analysis, the composite Quality Management Practices is considered as the criterion (dependent) variable and the independent variables are Organizational Structure, Staff Development, Leadership Style, Organizational Culture, QM
Knowledge and TQM Courses. There appears to be a significant linear relationship between the predictors (independent variables) and the dependent variable ($F = 50.31, \ p < 0.01$). Organizational Structure was found to be the main predictor ($\beta = 0.41$) to the variance of the Quality Management practices. All these predictors accounted for 78.2% of the Quality Management practices as shown in Table 4.21.

Table 4.21.

Multiple Regression of Quality Management Practices

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>$R$ Square</th>
<th>$F$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Management Practices</td>
<td>0.78</td>
<td>50.31**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>$\beta$</th>
<th>$t$-value</th>
<th>Sig. $t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Structure</td>
<td>0.41</td>
<td>4.97</td>
<td>$&lt; 0.01^{**}$</td>
</tr>
<tr>
<td>Staff Development</td>
<td>0.34</td>
<td>3.18</td>
<td>$&lt; 0.01^{**}$</td>
</tr>
<tr>
<td>Leadership Style</td>
<td>0.19</td>
<td>2.17</td>
<td>$&lt; 0.05^{*}$</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>0.07</td>
<td>0.64</td>
<td>0.53</td>
</tr>
<tr>
<td>TQM Course</td>
<td>-0.08</td>
<td>-1.51</td>
<td>0.14</td>
</tr>
<tr>
<td>QM Knowledge</td>
<td>-0.04</td>
<td>-0.81</td>
<td>0.42</td>
</tr>
</tbody>
</table>

** Significant at the 0.01 level.
* Significant at the 0.05 level.
A Stepwise Multiple Regression was conducted to test for variance of the Quality Management Practices. Quality Management Practices serves as the criterion or dependent variable, whereas Organizational Structure, Staff Development, Leadership Style were entered as independent variables. In Table 4.22, Staff Development was found to be the main factor which accounted for 64.5 percent of the explained variance of Quality Management practices. Leadership Style was found to have the lowest contribution to the explained variance of Quality Management Practices at 5% significant level. It accounted for only 1.2 percent to the explained variance.

Table 4.22.

*Stepwise Multiple Regression of Quality Management Practices*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Development</td>
<td>0.65</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>0.76</td>
</tr>
<tr>
<td>Leadership Style</td>
<td>0.77</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$-value</th>
<th>Sig. $t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Development</td>
<td>0.80</td>
<td>12.71</td>
<td>$&lt; 0.01^{**}$</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>0.46</td>
<td>6.53</td>
<td>$&lt; 0.01^{**}$</td>
</tr>
<tr>
<td>Leadership Style</td>
<td>0.19</td>
<td>2.13</td>
<td>$&lt; 0.04^*$</td>
</tr>
</tbody>
</table>

$R^2 = 0.77$  \hspace{2cm} $F$-value = 98.55**

** Significant at the 0.01 level
* Significant at the 0.05 level
4.5.6 Research Hypotheses

The following hypotheses serve as anchor for analysis of the predicted significant differences between excellence award winning schools and non excellence award winning schools on the Quality Management Practices. The relationship between the perceived levels of Quality Management Practices and the independent variables were also investigated to provide a more justified explanation for quality school management for this initial application study.

Hypothesis 1: There are significant differences between award winners and non-winners on the level of School Quality Index.

Hypothesis 2: Excellence award winning schools will have significantly higher levels of Quality Management Practices.

Hypothesis 3: Excellence award winning schools will have significantly higher levels of Quality Performance.

Hypothesis 4: Quality Management Practices is significantly related to the Quality Performance.

Hypothesis 5: There is a positive relationship between Transformational Leadership and Quality Management Practices.

Hypothesis 6: Organizational Structure is significantly related to Quality Management Practices.

Hypothesis 7: There is a significant positive relationship between School Culture and Quality Management Practices.

Hypothesis 8: There is a significant positive relationship between Staff Development and Quality Management Practices.
4.6 Summary of the Result of the Hypothesis Testing

Correlation Coefficient Analysis was used for testing Hypotheses 4, 5, 6, 7 and 8, whereas Hypotheses 1, 2 and 3 were tested in t-test. Table 4.23 summarizes the results of the hypothesis testing.

Table 4.23.

Summary of the Results of Hypothesis Testing (N=91)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>p-value</th>
<th>Significant Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>t- test Results:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>&lt; 0.01**</td>
<td>There is significant difference between award winners and non-winners on the level of School Quality Index.</td>
</tr>
<tr>
<td>2.</td>
<td>&lt; 0.01**</td>
<td>Excellence award winning schools will have significantly higher levels of Quality Management Practices.</td>
</tr>
<tr>
<td>3.</td>
<td>&lt; 0.01**</td>
<td>Excellence award winning schools will have significant higher levels of Quality Performance.</td>
</tr>
<tr>
<td><strong>Pearson Correlation Results:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>&lt; 0.01**</td>
<td>Quality Management Practices is significantly related to Quality Performance.</td>
</tr>
<tr>
<td>5.</td>
<td>&lt; 0.01**</td>
<td>There is a significant positive relationship between Transformational Leadership and Quality Management Practices.</td>
</tr>
<tr>
<td>6.</td>
<td>&lt; 0.01**</td>
<td>Organizational Structure is significantly related to Quality Management Practices.</td>
</tr>
<tr>
<td>7.</td>
<td>&lt; 0.01**</td>
<td>There is a significant positive relationship between School Culture and Quality Management Practices.</td>
</tr>
<tr>
<td>8.</td>
<td>&lt; 0.01**</td>
<td>There is a significant positive relationship between Staff Development and Quality Management Practices.</td>
</tr>
</tbody>
</table>

** significant at the 0.01 level
* significant at the 0.05 level
In summary, from phase I of this study, the constructs of Quality Management Practices and Strategies were justified with the content validity, construct validity as well as the criterion-related validity. The internal consistency and the test-retest reliability indicated the School Quality Management Scale, being constructed and validated in this study is a valid and reliable instrument in measuring quality improvement on the school management. In this study, 55.5% of the respondents have recorded a mean score of above 3.5 value in the quality management practices.

The results from phase II of this study as the initial application for the measurement instrument have indicated significant difference in the composite Quality Management Practices and all its seven constructs of Quality Management between the excellence award winning schools and the non-winners. In general, the survey indicates that award winning schools outperform non-award winning schools in mean score of quality management practices and quality performance. Good quality performance is associated with mean score of quality management practices (Pearson’s correlation coefficient = 0.71). All the independent variables of this study, namely, Transformational Leadership, Organizational Structure, Organizational Culture and Staff Development were also found to be significantly related to the Quality Management Practices. The result obtained in this initial application study has further justified the efficacy of the SQMS as a valid and reliable instrument to measure quality management practices and quality improvement within the school system.
CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

There are four sections in this chapter. The first section discusses the summary of the major findings of this study. The second section discusses the limitations of the study. The third section looks at some of the implications based on the study’s findings. Finally, the last section provides some suggestions for future research in the field of quality improvement of school management.

5.1 Summary of the Major Findings

The refined instrument, SQMS, was constructed after a thorough review of the conceptual, practitioner and empirical literature on quality management. The instrument was empirically validated with the cooperation of 398 teachers from 20 secondary schools in the Kinta district of Perak state.

The following specific steps were used for the scales construction and validation in this research.

i. Verification of content validity through an extensive review of related quality management literatures.


iii. Construction, adaptation and modification of items on the constructs of Quality Management and the determinants of TQM.
iv. Item analysis on the scales of the constructs of Quality Management Practices for checking item inter-correlation greater than 0.30.

v. Conducting a factor analysis to verify construct validity. Item responses were examined to identify major factor according to eigenvalue and item factor loading.

vi. Refining the scales using the reliability analysis. Cronbach’s coefficient alpha was used to examine the internal consistency of the scales.


ix. Conducting initial application study on excellence award winning schools and non winners to justify the efficacy of the instrument.

x. Hypothesis testing of the predicted significant differences and relationship between award winners and non-winner on the Quality Management Practices and its respective constructs.

The results obtained from the above steps provide tentative evidence that the instrument, SQMS, is a reliable and valid instrument in measuring quality improvement of the schools.

Both the qualitative and quantitative methods were used in this study to enhance the understanding of social phenomena (Creswell, 1994). Structured
interviews with the top management of four selected excellence award-winning schools were carried out to obtain more in-depth information to provide an understanding of contextual background on quality improvement practices in the local school system. Top management of the school consists of the principals and the senior assistants who have undergone administrative and management courses on TQM and ISO 9000 Certification.

Pilot study was conducted on the items of the School Quality Management Scale (SQMS) which were constructed based on rigorous review of the related literature, expert review and information gathered from the interviews with four selected top management of secondary schools. This was followed by the administration of the actual survey instrument i.e. School Quality Management Scale (SQMS) on perceived quality assessment in the selected secondary schools. The SQMS is an instrument that was developed based on Malcolm Baldrige Quality Award Education Criteria for Performance Excellence where it was used as a performance indicator of quality management. It was designed in the context of Deming Theory of Profound Knowledge which recognized the impact of system in the behavior of people. Statistical procedures were employed to ascertain the reliability of SQMS. Additional statistical procedures were conducted to refine the items of the instrument. The refined version of the SQMS was then used and tested in the initial application study.

There is little research examining the suitability of quality award model in measuring quality in the specific education settings. Thus, this study
examined the efficacy, with emphasis on the psychometric properties, of the SQMS in the context of quality improvement on the school system in Malaysia. The SQMS specifically aimed to monitor quality improvement at the school level and to measure differences between actual and ideal quality of the school management as perceived by teachers.

In this study, teachers’ perceptions on the seven dimensions of quality management were recognized as affecting the quality of the school system and performance. The seven dimensions are top management support, strategic quality planning, customer focus and satisfaction, staff total participation, continuous improvement, quality and operational results, information and analysis.

The perception of teachers was obtained in understanding the level of quality management practices in the school system. The need to understand perception of quality improvement characteristics was emphasized in this study because the success of any change effort depended heavily on the commitment and aspiration of the top management and employees (Gunasekaran, 1999). Several researches done in the western countries have shown that employee perception are correlated with desired organizational outcomes (Coyle-Shapiro, 1999; Schneider & Bowen, 1985). According to Rowkey (1998), quality can be measured objectively or subjectively. Therefore, it is essential to measure quality effort subjectively in public organization as their services are perceived to be of a certain quality, apart from being measured objectively.
Extensive review of the related literature on the constructs and domain of Quality Management Practices was performed to verify the content validity. Content validity was also demonstrated throughout this research with every effort made in the interview, construction of items, pilot-testing and analysis of the instrument.

Factor analysis was conducted on the constructs of the Quality Management Practices to verify the construct validity. After performing 2 rounds of principal component analysis on the original 50-item SQMS, a seven-factor model consisting of the remaining 42 items was retained. This was because the 7 factors were conceptually meaningful and had greatest conceptual clarity in describing quality improvement strategies in school management and the total variance accounted by these 7 factors was 61.26%. Each of the factors had at least five items with significant structure coefficients as compared to three items in the normal practice (Creswell, 2002). All the remaining 42 items in the scales had Eigenvalue greater than 1 and loading of individual item of greater than 0.40 on the respective construct. This analysis verify the scales measure seven single, independent construct and were correlated with independent measure of related construct of the Quality Management Practices. The seven constructs of the Quality Management Practices were identified as Top Management Support, Strategic Quality Planning, Customer Focus and Satisfaction, Staff Total Participation, Continuous Improvement, Quality and Operational Results, and Information and Analysis.
Criterion-related validity was demonstrated when high positive correlation was found between the seven constructs of the Quality Management Practices and the quality performance. Criterion-related validity basically examines the relationship of the constructs of the Quality Management Practices to the quality performance. The Pearson correlation coefficient was used for examining the criterion-related validity (Hair, et al. 1992). The mean score of quality management practices was correlated with the mean scores of the quality performance achieved. A significant correlation coefficient of 0.69 was obtained between the two mean scores. Generally, a correlation coefficient of more than 0.6 was accepted and thus, the SQMS also exhibit criterion related validity.

The overall teachers’ perception on the quality management practice was found to be above the mid-point, 3, this indicated that the teachers were able to follow quality management strategies and initiatives proposed by the school management.

Reliability of the survey instrument was established by calculating Cronbach’s alpha coefficient which was one of the most commonly used indicators to measure the internal consistency of the survey scale (Hair, et al. 1992). The reliability coefficient for the entire SQMS instrument was 0.96, indicating a high degree of internal consistency for group analyses. The Cronbach’s alpha for the individual 7 factors or subscales ranged from 0.79 to 0.90. According to Nunnally (1967), a reliability coefficient of 0.70 is considered acceptable in the educational research. The item/total correlations
for all the seven subscales in the SQMS ranged from 0.36 to 0.75 with majority of the item/total correlations fell between 0.50 and 0.60. As a result, the instrument was judged to be internally consistent and therefore reliable.

A significant correlation of 0.90 was established between mean scores of the quality management practices for the test-retest reliability over a period of five months and this indicated a strong positive correlation. The individual mean scores of the 7 component of the quality management practices were also examined for the test-retest reliability and they were all found to be significantly correlated at a range from 0.57 to 0.86. This result indicated stability of the SQMS and the subscales over a period of five months.

Positive and significant correlations were also found between the seven subscales and the composite quality management practices. The two strongest correlations were the Continuous Improvement subscale ($r = 0.89$) and the Information and Analysis subscale ($r = 0.89$) respectively. This result indicated that the Continuous Improvement subscale and the Information and Analysis subscale were found to have the strongest correlation on the school quality management practices.

The relationship between the determinants of TQM and the Quality Management Practices was found to be positive and significant with Pearson correlation coefficient ranging from 0.68 to 0.75. The strongest positive and significant correlation ($r = 0.75$) was found between Staff Development and the composite Quality Management Practices.
The result of $t$-tests on gender indicated that there was no significant difference in the levels of quality management rating among the male and female teachers ($t$-value = -0.93, $p = 0.35$). But significant difference was found in the levels of quality management rating among teachers from excellence award winning schools and the non-award winning schools ($t$-value = 9.56, $p < 0.01$). While it was found that there was no significant difference in the quality management rating between urban and rural school teachers ($t$-value = 1.14, $p = 0.25$).

The above comprehensive scales refinement and validation procedure were executed to seek for justification that the SQMS is a potentially reliable and useful instrument in measuring quality management practices in schools. The instrument was empirically tested through a field study of 398 secondary school teachers and later used in an initial application study on excellence award winning schools to justify the efficacy of the instrument.

5.2 Limitations of the study

The sample in this study was randomly selected from secondary school teachers of Ipoh City and the suburbs of Ipoh. They were a convenience sample of teachers teaching in the urban and suburb locations of the Kinta District in the state of Perak, Thus, generalization of these results is limited. Also, while the majority of the sample came from urban schools, approximately 21.4% of the sample came from suburb or rural schools. However, a comparison of the two samples on the total score from the SQMS did not reveal any significant differences.
This study was conducted using both interviews and surveys and was subjected to the limitations of both of these methodologies. Since only the principal or headmaster of the excellence award-winning school was interviewed, it was unlikely that his views reflected the views of all the staff in the school. The survey questionnaire ensured greater representation of opinions since senior assistants and teachers were requested to answer the instrument. However, respondents might have provided socially desirable answers that do not reflect the actual scenario.

One of the limitations of the study was the data collection, which was conducted at a single moment in time except for test-retest reliability. This may limit the accuracy of this research. The information gathered about the quality management practices in schools, might not be similar to the past studies in school management system. Another limitation was the self-report nature of several critical variables including quality knowledge levels, TQM briefing and courses attended. The direct measures may have decreased the potential for bias on some of these variables.

Another primary limitation is the construction and validation of the measurement scales in measuring quality management practices and its correlates because the psychometric properties of these measurement scales were not well known. The instrument, SQMS was built based on Malcolm Baldrige National Quality Award criteria framework with adaptation and modification to suit local context. The SQMS did not capture every aspect of school effectiveness, but it aimed to gather reliable and valid information on
those elements of management that teachers experienced directly in the local school system (Poston, 1995). Thus, rigorous studies and more care should be observed in the interpretation and generalization of the findings relating to quality management practices and initiatives.

The results of this study suggested that the SQMS had the potential to be a useful instrument in assessing how teachers perceive quality management practices that are being implemented in the schools. As it is in its early stages of development, more studies need to be conducted to test the trustworthiness of these findings.

5.3 Implications of the study

This research has focused on three main issues. The first was the definition and specification of the TQM concept. The second was the construction and validation of a measurement instrument for school quality management, namely, School Quality Management Scale (SQMS). Thirdly, the initial application of the instrument that enabled school administrators gain a more thorough knowledge of quality management in determining quality performance.

This research emphasized the feasibility of applying the quality management practices to the evaluation of the overall school quality performance. The process and methodology used for the construction and validation of the measurement instrument, SMQS and the psychometric
properties of the SQMS as a measurement instrument were also thoroughly studied and analyzed.

The definition of SQMS as an attitudinal concept allowed the researcher to develop a valid measurement instruments and expanded its scope of application to determine the perception of teachers about the quality management practices in schools. This is in accordance with the conceptualization of service quality being adopted by a few foreign researchers (Parasuraman, Zeithaml, & Berry 1985; Carman 1990). Due to the lack of empirical studies on total quality management for Malaysian schools, it has been difficult to interpret and generalize the findings of this study to other populations. With the construction of the SQMS, it was hoped that researchers can begin to better understand and describe the implementation of total quality management in Malaysian schools.

The results of this study indicated that the SQMS was characterized mainly by seven constructs of the quality management practices, namely Top Management Support, Strategic Quality Planning, Customer Focus and Satisfaction, Quality Operational Result, Information and Analysis, Continuous Improvement and Staff Total Participation. The positive significant correlation between the seven constructs of quality management practices and the perceived quality performance provided strong evidence of criterion-related validity. During the development of the SQMS, there were some interesting findings. The strongest relationship was observed between quality management practices and information and analysis. It was found that
continuous improvement and information and analysis were the two constructs that imposed the greatest effect on the overall quality management practices.

All the seven dimensions or subscales of the quality management practices in SQMS showed eigenvalue of more than 1 and the factor loadings of the individual items on the respective seven subscales were high, thus verifying a strong construct validity. The seven subscales were also found to be significantly correlated with the independent measures of the related constructs. Each of the seven subscales was found to be measuring a single and independent quality management constructs.

This study successfully developed an instrument that can be used to evaluate quality management and quality improvement efforts in Malaysian schools. The instrument was empirically based and appeared to be reliable and valid. The reliability coefficient alpha of the instrument on the determinants of the TQM ranged from 0.57 to 0.93. Whereas, the reliability coefficient alpha of the constructs of quality management ranged from 0.79 to 0.97 and the reliability coefficient alpha of SQMS was 0.97. The content validity was justified by the systematic and rigorous review of the related literatures on quality practices and the comprehensive pre-testing.

This study has reported an initial application study of the School Quality Management Scale (SQMS) developed by the researcher where data and findings from the initial application study were found to be supporting the
reliability and validity of the scale. The results of the analysis from the initial application study provide initial evidence for the scale as a potentially useful instrument. The significant differences between the award winning schools and non-award winning schools on the perceived level of quality rating and the School Quality Index revealed the efficacy of the instrument in measuring the quality improvement in the school management in these schools. It is important to note that the scale consisted of 42 items that measure seven different dimensions of quality management practices; however, there were two factors that only had five items load on them (Top Management Support, Operational Result), compared to other factors that had eight and six items. After reviewing the literature, it is apparent that these factors, especially Top Management Support, are important, yet five items probably do not fully capture the essence of the factors. Future research should focus on adding more items to these factors. It should also be pointed out that the Cronbach alpha for the entire instrument of SQMS was 0.97, which indicates that responses to all of the resulting items were consistent, and suggests that it would be acceptable to use a total score versus individual subscale scores.

Finally, the results obtained in the initial application of the SQMS measurement instrument show the existence of a high reliability and construct validity. The estimated parameters show high reliability coefficients, and the different tests applied confirm the existence of high criterion-related and construct validity. As a whole, these results show that the SQMS measurement instrument meets the main requirements for measurement
instruments in social sciences, and therefore, is suitable for application to the evaluation of quality management in public schools.

5.4 Future Research Directions

The finding of this study also provides a direction to the development of an empirical understanding of total quality management implementation in schools. The SQMS can be used to improve existing self-assessment framework such as the Prime Minister Quality Award Criteria for Public services.

The overall results and findings of this study were encouraging because they are based on an established theoretical framework of the modified Malcolm Baldrige Quality Award adapted to the local context and requirement. However, potential weakness of the study should not be omitted. The SQMS has been tested only in 20 Kinta district secondary public schools and we cannot generalize the outcome in other types of schools without further testing. Nevertheless, studies should not be limited to only public secondary schools as in this study. Future research should include a larger sample of both private and public primary schools to increase the reliability and generalization of the findings. Further research needs to be conducted to improve the reliability and validity of the scales by using samples from other population and location. This study is a cross-sectional study representing a single point in time, thus, the results are limited in the degree of generalization within the selected sample. Further investigation using a longitudinal study could be carried out.
The results obtained in this research suggest the need to take an in-depth look at the influence of SQMS on school ability to increase higher quality management and performance. The instrument developed in this research can be used as a valid measurement to identify the existence of such quality management practices in schools. The process of constructing a psychometrically sound scale for quality management is lengthy, thus, more scale development work in the educational setting is needed. Several of the subscales in the SQMS need to have additional items to more fully capture the underlying dimensions of quality management. The reliability of the subscales will be increased by addition of related items.

In addition, the importance of aspects related to learning, teaching, and orientation toward quality in the educational institution must be thoroughly examined and analyzed in order to get a good picture of total quality management in all aspects of the educational institutions.

Finally, with regard to future research, the SQMS can be used to improve existing self-assessment framework such as the Prime Minister Quality Award Criteria for Public services. Further research can also focus on the development of strategies and programs to increase the quality management practices in service organization. Research on the impact of reward system, motivation and training towards quality management practices in educational institutions can also be carried out. The scope for further research in quality management practices is thus extensive and challenging for future researchers.
References


