Process and Quality Management in Vocational Education & Training (VET)

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Abstract
UNESCO has been urging countries for the last decade to undertake initiatives to enhance Technical and Vocational Education and Training (VET) which should be a vital aspect of the educational process in all countries (UNESCO, 2001). This demand has driven countries to embark on their individual “quality missions” in an effort to uncover the best approach to embedding quality management into their reform programs. Quality implementation in VET has been approached differently depending on the countries’ culture, their education systems, and their societies rules and values. This paper presents what quality, in general, means and some of the main concepts associated with its implementation and assurance. Additionally, the aim of this research is to gauge the concept of quality management in Vocational Education and Training (VET). Thirdly, this paper looks to disseminate what has been discovered and highlight paths that those concerned with VET are taking.

Keywords: Quality Management, Vocational Training, Total Quality Management, Quality Standards, Quality Excellence Awards, Business Process Management
1. Introduction

Education reform, as a whole, is hurriedly being designed and implemented across the world as it is well documented that investing in education is vital in both developing countries and knowledge based ones alike. Contemporary descriptions and definitions of quality within the education sector are often used in correlation with the age of the country. This is due mainly to perceptions that the older the country, the more time it has had to invest in education reform.

As the UNESCO Revised Recommendation on Technical and Vocational Education and Training notes, “Given the immense scientific, technological and socio-economic development, either in progress or envisaged, which characterizes the present era, particularly globalization and the revolution in information and communication technology, technical and vocational education should be a vital aspect of the educational process in all countries” (UNESCO, 2001). Statements such as these have driven countries to embark on their individual “quality missions” in an effort to uncover the best approach to embedding quality management into their reform programs. However, the research has uncovered that the main challenge that arises with implementing quality is what this means to individual countries, their education system, and their societies. As such, this paper looks to present what quality, in general, means and some of the main concepts associated with its implementation and assurance. Additionally, the aim of this research is to gauge the concept of quality management in Vocational Education and Training (VET). Thirdly, this paper looks to disseminate what has been discovered and highlight paths that those concerned with VET are taking.

In section 2.1, a literature review has been conducted on quality and its related concepts. Defining quality, quality management, quality management systems, and a brief overview of total quality management will be discussed in the initial section. In sub section, 2.1.1, the reader will have the opportunity to read about some of the philosophies that set the foundation for quality. In 2.1.2 and 2.1.3 respectively, the writers have elaborated on some of the many methodologies, frameworks, and standards that are associated with quality and its implementation. In section 2.1.4, Excellence Awards will be covered followed by section 2.2 which will provide a description of the Vocational Education and Training (VET) sector. In the section, 2.3, the reader will get a glimpse into quality management in VET. In Part B of the research, underpinning theories related to two case studies has been presented. The final section, Part C, analyzes these case studies for the basis of gauging the pathway in which a university and a country is taking to impart quality in their institutions. It is important to note that limitations do exist in this research. This paper does not intend to have covered all aspects related to the individual systems researched. Additionally, the information is only as accurate as reported at the time it was accessed. Future publications may be in existence that was not discovered at the time this paper was written.
2. Literature Review

2.1 Quality Management

Defining Quality

Definitions of quality vary with industries, individuals and over time. This is due to multiple definitions of quality, which differ across industries, along with perceptions, lack of thorough study, knowledge and application of quality.

According to the American Society for Quality (ASQ), “quality” can be defined in the following ways: The first definition is that quality is based on customer’s perceptions of a product/service’s design and how well the design matches the original specifications.

A second definition provided by the ASQ, is the ability of a product/service to satisfy stated or implied needs. A third definition is that quality is achieved by conforming to established requirements within an organization (Russel, 2013).

Additional definitions of quality are noted in various sources such as A Quality Handbook, which define quality as “the totality of characteristics of an entity that bear on its ability to satisfy stated and implied need”, “Quality is the ongoing process of building and sustaining relationships by assessing, anticipating, and fulfilling stated and implied need” and “the degree to which a set of inherent characteristics fulfill requirements (Quality Handbook, 2013).

On the other hand, a more simplistic, tangible and practical definition of quality stems from Juran's (2013) "fitness for intended use." His definition maintains that quality is "meeting or exceeding customer expectations." Another useful definition comes from Deming et al (2013) that state that the customer's definition of quality is the only one that matters. With these definitions and descriptions of quality the question of ‘Who is the customer?’ must be answered to further drive the pursuit of quality (Deming, Juran & Crosby: Contributors to TQM, 2013).

Today, the focus by managers on quality as a way of reducing costs, increasing productivity and meeting customer requirements and this need has increased more than ever.

Defining Quality Management

Quality Management can be described as a strategy in an organization which involves all employees and ensures continuous improvement with the aim of providing customer satisfaction. (CEDEFOP, 1998). Several components are involved in quality management: Quality Planning, Quality Assurance, Quality Assurance, and Quality Improvement.

Quality planning is a systematic process that translates a quality policy into a set of measurable objectives and requirements within a set timeframe (Business Dictionary, 2013). Quality Assurance and Quality Control are terms mentioned together. While this is true, the terms are different. Quality Assurance is about defect prevention while Quality Control involves having control check to find defects. Quality Improvement can be considered within the area of performance analysis. It can incorporate process improvement, product or service improvement. There are many examples of methods used for quality improvement such as Quality Circles, PDCA (Plan-Do-Check-Act) all used to ensure continuous improvement. Some of these will be discussed in the following sections.

Defining Quality Management Systems

A quality management system (QMS) is defined as a system by which an organization aims to reduce and eventually eliminate nonconformance to specifications, standards, and customer expectations in the most cost effective and efficient manner (Business Dictionary, 2013). The key term in a QMS is “customer”, as it drives and prompts the development of the system. The purpose of having a QMS in an organization is to establish a shared vision for all, set and organize objectives, as well as guide the organization to a culture infused with quality. One can visualize a QMS as a continuous cycle with the customer’s requirements at the beginning and customer satisfaction as the ending output.
The following figure - Figure 1 is a simple illustration of the QMS cycle which shows that the customer’s needs both explicit and inexplicit, need to be accounted for before the development of the other four components. It requires strong management “buy in” and support as key decision makers and the management are key drivers throughout the development, implementation and maintenance stages of the cycle.

### Figure 1: QMS Cycle

Within this cycle are quality concepts such as customer focus, strategy, human resources, leadership, processes and other considerations such as performance measurement, change management and knowledge management to name a few. These elements will be reoccurring fixtures throughout this paper but the goal of this system is continuous improvement by all involved in making the customer satisfied.

#### 2.1.1 Philosophies in Quality Management

In this section of the paper, the writers will discuss key philosophies, concepts and their originators with the intent of displaying the “evolution of quality” and some of its main contributors.

**Total Quality Management (TQM)**

One of the first terms that surface when discussing philosophies in QM is TQM. A core definition of total quality management (TQM) describes a management approach to long–term success through customer satisfaction. In a TQM effort, all members of an organization participate in improving processes, products, services, and the culture in which they work (ASQ, 2013). TQM is a widely utilized, comprehensive and structured approach management system focused on the customer and involves all employees in the process of continuous improvement. It is a management concept coined by J. Edward Deming (Tewari & Dias, 2010) though, Joseph Duran, and Philip Crosby developed different aspects that contributed greatly to its evolution. (Deming, Juran & Crosby: Contributors to TQM, 2013). More about how to implement TQM in a VET institution will be looked at later on in this research.

A review of the literature and current research unearths many descriptions of TQM and the similarities and differences between TQM and quality assurance, quality control, and quality management. Though definitions used by organizations, societies, and other groups stem from the work of J. Edward Deming, Joseph Duran, and Philip Crosby, confusion still leads researchers and ‘experts’ to sometimes use terms associated with TQM incorrectly or interchangeably. Therefore to clearly understand TQM it is important to have a clear definition of related terminology and understanding of the words “total” and “management”. Quality assurance (QA); quality management (QM); and quality management systems (QMS) must also be understood, though considered as separate and sub-elements of TQM.
"Total" in relationship to TQM refers to the company-wide or organization-wide understanding and effort that follows. It includes everyone in the organization because everyone is needed to show improved performance. Management must lead in a comprehensive manner so that all or the "total" group has a combined effort in improved performance (Deming, Juran & Crosby: Contributors to TQM, 2013).

The next term, "management" refers to everyone managing their job effectively or according to predetermined requirements as Crosby notes (Deming, Juran & Crosby: Contributors to TQM, 2013). This leads to combined and productive work by everyone in the organization. Quality assurance (QA) and quality control (QC) effectiveness can determine the success or failure of a company or organization.

A company with strong quality systems is able to compete, meet quality levels, and maintain customers and employees. Quality Assurance (QA) and Quality Control (QC) are frequently confused and interchanged. They are vital components of quality management and they have distinct features. QA is fundamentally focused on planning and documenting those processes to assure quality including things such as quality plans, inspection and test plans. It goes on to state that QC is a process involved within the system to ensure job management, competence and performance during the manufacturing of the product or service to ensure it meets the quality plan as designed.

**TQM and “Kaizen”**

Total Quality Management is one of the key tools that are used frequently to facilitate the implementation of Kaizen Process. It is described as a management policy that works alongside Kaizen Principles. In fact, Total Quality Management could be portrayed as a Kaizen Process that when implemented leads in total engagement of all employees from all levels of the organization (kaizen-news.com, 2013).

A collective performance is utilized within the organization meaning all employees from the highest-ranking manager to the simple worker collaborate. This results in producing optimum performance and contribution at each stage or process. The outcome of implementing Total Quality Management alongside Kaizen is achieving total customer satisfaction.

Total Quality Management can also be defined as Total Quality Control. The both work together and are considered a convenient way of meeting organizational goals specially when concerned with development. Kaizen is a method of bringing continuous improvement to the organization as a whole. Therefore when Total Quality Management is implemented alongside with Kaizen, improvement is achieved in the managerial sector.

When implementing both Kaizen and Total Quality Management, total cooperation is needed within the organization from all employees and management. Top management should create an environment conducive for workers to interact and share ideas with superiors. This will eventually bring continuous improvement since no employee in the organization is left out (kaizen-news.com, 2013).

**Quality Founders**

Experts in the field have made notable contributions. Some of the most referenced professionals in the field when it comes to the evolution of quality are W. Edwards Deming, Philip B. Crosby and Joseph M. Juran. Interestingly, Deming and Juran have been involved in the institutionalization and teaching of quality management to the Japanese who learnt a great deal from these Americans and later perfected the philosophies of quality.

Over the years the list of “quality experts” has increased, adding names such as Dorian Shainin, William Conway, and Armand Feigenbaum along with many others have emerged. Yet the names often mentioned are Deming, Juran and Crosby who have achieved top status and have also built the foundation of quality by introducing the concepts of Quality Control, Total Quality Management, Cost of Quality and Statistical Process Control (Joseph Oberle, 1990).

According to Deming, if you improve quality then you automatically will improve productivity. You capture the market with lower price and better quality. You stay in business and provide jobs, it’s so simple” (Deming Institute, 2013). Feigenbaum originated the concept of total quality control and contributed to the concept of quality cost. He is also known for the term “hidden plant”, which highlights having to do extra work due to
correcting mistakes. Another major contributor is Ishikawa for his creation of the cause-and-effect diagram or fishbone diagram. Shingo conceived the Poka-yoke which means mistake proofing and Just-In-Time which is applied in storage and warehousing. There are other notable contributors and these are just a few.

W. Edwards Deming

Deming was known as the pioneer, the groundbreaker. He went to Japan to introduce and teach the system of “SPC”, a statistical method used to examine work processes. The Japanese also learnt a great deal from Deming’s 14-point program, this program was aimed at managing productivity and quality (Joseph Oberle, 1990).

Deming’s 14 Point Program

The emphasis of the 14 points is to stress on the importance of management’s involvement in the overall system of the organization. It begins with the top-management’s commitment that is crucial for enhancing quality and productivity. Figure 2 mentions all 14 points stated by Deming. In the next section, Highlighted are Deming’s key points from management’s perspective (Deming.org, 2013).

Another important key point is education and on job training, new skills are always required to keep up with the changes in methods, product design and machinery, therefore all members of the organization at all levels need to be trained in all methods and assisted in using them. Also listed was that management should eliminate targets, deadlines and the fear to contribute ideas within organization. A more open communication environment is required within the organization; this will assist in improving overall quality. Deming also talks about the need for people in work in teams within an organization. Different departments across the organization need to collaborate and break down all barriers between each other in order to tackle problems that may be faced with products and services. Another important point made by Deming was that management should cease dependence on inspection. Mass inspection is time consuming and costly, instead quality needs to be built into the product. (Deming.org, 2013)

Figure 2: Demings 14 Point Plan for TQM  (1000Advices, 2013)

Deming’s Seven Deadly Diseases

Deming describes the seven biggest barriers that management meets in an organization. He suggests that without long-term planning, management will always have difficulties achieving ultimate goals for the organization. Management needs to learn how to be more future-oriented when it comes to planning. Another setback is management’s focus on short-term profits, management always find this easier to pursue as it
involves cutting back on expenses related to the long-term. Examples of cut backs would be in training and education, maintenance.

An additional barrier that needs to be highlighted is job-hopping. This happens from time to time where the entire structure of the organization is changed including top management. This change leads to the interruption of continuous improvement methods as new leaders come on board; therefore the previous system is changed (IBS, 2013).

Deming’s PDSA cycle

Deming followed and made some alterations to the PDSA cycle, originally developed by Shewhart. The main objective of this cycle is assist in planning- to carry on a process, manufacturing- or to do it, verify or check to make sure standards and requirements are met. He also stated that an organization must correct the process in order to maintain acceptable outcome performance. The reason why Deming has changed the cycle to PDSA (Plan-Do-Study-Act) is that he came to realize that controlling the process was not good enough. He relabeled the cycle to a process of feedback and gaining knowledge for the purpose of continuous improvement. In other terms, PDCA cycle is used for identifying the need for improvement, whereas PDSA is used to sustain improvement (Gupta, Praveen, 2006).

Jospeh M. Juran

Joseph M. Juran, another quality founder has greatly contributed to society in the field of quality management. Juran is recognized for adding the managerial dimension into quality, taking it from its statistical origin. Like Deming, Juran has passed over knowledge of quality management to the Japanese transforming them into leaders in quality systems. He is well known for creating the Juran Trilogy. The Juran Trilogy, published in 1986, was accepted internationally as the foundation of quality management. This trilogy defined three management processes required by all organizational types to improve processes in the fields of Quality Control, Quality Improvement and Quality Planning. The trilogy’s main aspect is focused on the customer’s perspective. Customers prefer products that are “free from trouble”, higher quality consists of less defects. Customers also perceive high quality products to having a greater number of features or options that meet with the customer’s requirements (Juran Institute, 2013).

Philip B. Crosby

Philip B. Crosby introduced the concept of “Zero Defects”. In Crosby’s view, quality meant, conformance to requirements or meeting requirements. (Crosby 1979). Crosby’s philosophy states that quality must be defined in clearly and measurably stated terms to assist management in taking actions based on tangible assets rather than on opinions and experience. Crosby’s main principle in quality management is prevention, he introduced statements including “Do it right the first time” and “Zero Defects” (Crosby, 1979).

Walter A Shewhart

Walter A Shewhart has developed statistical methodologies in the quality management systems and has illustrated on how it is done. He has pioneered the field of Quality Control. His manual, entitled “Economic Control of Quality of Manufactured Product” was published in 1931 and is regarded as a complete explanation of principles of Quality Control (Qualitygurus.com, 2013).

2.1.2 Frameworks & Methodologies

Quality Management Frameworks

As described earlier in this paper, quality is an integral part in every organization brought about by the need to satisfy customers. If an organization is to meet this objective of satisfying customers, they must adopt a quality framework and methods which will allow them to do so. The most renowned framework that has been adopted by organizations across the world is Six Sigma. It was originally developed by Motorola in order to reduce defects in 1985 (Businessballs, 2011). However, the concept was taken to a higher level by Jack Welch of General Electric in 1995. Some of the early adopters of Six Sigma were Honeywell and Dow Chemical but since. Initially implemented in the manufacturing industry, this framework is currently being used by a magnitude of organizations from many industries.
Defining Six Sigma

Over the years the definition of Six Sigma has expanded substantially and now represents a number of different concepts. The ultimate objective of Six Sigma is to ensure the process does not produce more than 3.4 defects per million attempts (Dummies.com, 2013). Six Sigma also can be defined as many things and is most certainly a problem solving methodology. Another way to describe Six Sigma is by “Six Sigma performance”, which illustrates that it is a process. A third concept is “Six Sigma improvement”, which focuses on key outcomes where processes related to work are exponentially improved. A forth concept is “Six Sigma deployment which covers a range of organizational elements from the initial roll out, to assigned roles & responsibilities, to procedures and standards that should be accepted across the organization.

A final concept is the “Six Sigma Organization”, which uses Six Sigma methods and tools to improve the performance. The latter focuses on increasing profits, lowering operating costs, improving customer satisfaction, heightening the operations capacity and capability, making the systems more comprehensive for stakeholders to work with whilst reducing the product/service cycle time and minimizing errors and defects.

In order to understand Six Sigma as a problem-solving methodology it is first important that the reader understands \( Y = f(x) \), as it is the most vital aspect of this concept. \( Y \) is the output that an organization will be attempting to measure and ultimately see improvements in. “\( f(x) \)” means the function of \( x \). An example, developed by the writers, of applying this is below:

Measure=on time registrations of Secondary Technical Schools (STS) Students during new registration for a new academic school year (Dummies.com, 2013).

I. “\( Y \)” would be the percent of on time registrations

II. “\( f(x) \)” would be the x’s or reasons that impact on time registrations
   a) \( x_1 \): limited staff
   b) \( x_2 \): long lines
   c) \( x_3 \): applications not filled properly
   d) \( x_4 \): applicants not having the correct paperwork

As a problem solving methodology, the above will allow an organization to determine all potential “x’s” that will have an impact on the timeliness of a new applicant getting registered. It will then determine the significance of these variables. The most important information for STS Management to capture during this analysis is what variables are having the most significant impact on a student getting registered on time. After this is determined, an intervention/improvement plan can be developed and control and maintenance mechanisms can be put in place.

Quality Management Methodologies

While Six Sigma represents the framework for process improvement, there are several management methodologies or models organizations use to plan for and sustain continuous improvement. The models to be discussed for the purpose of this paper are: PDCA (Plan-Do-Check-Act), DMAIC, DMADV and RADAR.

PDCA

The Plan-Do-Check-Act model of continuous quality improvement is often called the Deming Cycle and is used for implementing proposed plans (Total Quality Management, 2009). It is made up of a sequence of repetitive steps. PDCA originated in the 1920s with Statistics expert Walter Shewhart and was later modified by Edwards Deming, TQM guru.

The steps are simple yet considered very effective in the prevention of defects within a process. The process of PDCA enables organizations to identify and address the root causes of problems. The four repetitive steps in the model are Plan, Do, Check and Act. The diagram below shows the process where continuous improvement is achieved with time (M. Sokovic, 2010). The PLAN step is when the process needs to be understood in order to identify the problem and plan for solutions. The current situation is analysed and ways to make improvements are developed. Data gathering is also part of this step.

The DO step is when a pilot process is developed and the process can be tested on a small group of customers for example and for a specified time. This can be monitored and test results collected.

http://www.ijmsbr.com
During the CHECK stage, data from the Do step is organized and it is determined whether the process is working or not. Decision is made whether to implement the proposed solution or go back to the Plan stage.

In the ACT stage, implementation of the process is achieved. The improved process will need to be documented and standardized (M. Sokovic, 2010). In figure 3, the reader can see this process take form.

**Figure 3: PDCA**

**DMAIC**

DMAIC is one of the methodologies that are utilized within Six Sigma projects. This methodology is always applied to processes that are already established but are experiencing issues that cause delay, quality reduction, and a skewed pattern in cost/benefit analyses. This acronym represents 5 steps or phases as define, measure, analyze, improve and control.

In the define phase, a project team must devise a project charter inclusive of a problem statement, business case, objectives, time lines, project scope and who the project team will consist of. During this phase it is also intended to define stakeholder assessment.

In the measurement stage the goal is to collect baseline information about the process or product. As highlighted in the problem-solving example above, this is the stage when an organization identifies all the potential “x’s” or variables.

Additional to this stage analyzing measurement systems & data collection, validation of assumptions, determining of cost of poor quality (COPQ), process stability, determining process capability and refinement of understand the process. Also during the measurement phase, tools that will be used for the project are to be evaluated. Some of these tools may consist of Cause & Effect Diagrams, Basic Control Charts and Six Sigma Statistics to name a few. In the analyze phase, it’s all about verification of the drivers. Statistics are used during this stage and in the simplest of terms an organization will need to find out the root causes that will drive the improvement initiatives.

As with the previous stage, the tools also are analyzed. During this fourth stage, the goal is to make sure that improvements are being made. This phase is about bringing the defining, measuring and analyzing phases full circle and going back and revisiting results. Activities that need to be done at this point are updating the improvement/implementation plan, updating the stakeholder assessment, revising the business case with investment return on investment (ROI) amongst other things. Naturally an organization will also look at improving the tools used and changing the course of action is necessary.

The final stage, Control, aims to automate and manage the mechanisms that will ensure maintenance and sustainability of the improvement. It is critical during this phase that an organization devises a well thought out control plan, training plan, and audit plan and accountability structure. In figure 4, the reader is able to see the DMAIC methodology inclusive of examples tools put into a template.
DMADV

DMADV is the third method this paper aims to explain. It is often used when an organization is introducing a new product or process. DMADV also consists of 5 phases. In the defining phase, goals are designed to fulfill customer needs. The measuring stage is meant for an organization to identify characteristics critical to quality (CTO). The third phase is the analyzing phase and this is done on data to create and design alternatives. The next stage is for designing and optimizing the details. The final stage is verification and implementing the process of an error-free production (SixSigmaOnline, 2013).

In figure 5, the reader is able to visualize that this method is a continuous cycle and it may be necessary to repeat phases throughout the process.

RADAR

RADAR is the last methodology discussed in this paper. Similar to the others it consists of 5 phases as and is an acronym for results, approach, deploy, assess and refine. This method of assessing performance is most known for its association with the EFQM Excellence Model. All components are interconnected and can be understood by first an organization must determine and
understand the results they are seeking to achieve. The approaches must also be planned and developed to ensure the sought after results can be achieved in the here and now as well as the future. Deployment, refers to a systematic way of ensuring implementation whilst the assess and refine stage looks at monitoring, analysis and ongoing learning initiatives. In figure 6, the reader can view the model as posted on the EFQM Website.

![Figure 6: RADAR](image)

### 2.1.3 Standards

A standard is a certificate that provides requirements, specifications and guidelines that are used to make sure that products, processes and services are up to the specified requirements. The creation of standards involves a collected effort from those who manufacture the product or provide the services, end users of the product or service and those responsible from regulation. It is important to note that the majority of standards are done at the request of a particular industry.

**Standard Developing Bodies**

There are many bodies around the world that have been established, usually by the government, to develop standards for products and services that we use every day. The European Committee for Electrotechnical Standardization (CENELEC), the European Committee for Standardization (CEN) and the European Telecommunications Standards Institute (ETSI) are the three European Standardization Organizations recognized as competent in the area of voluntary technical standardization. (CENELEC, 2013) Another renowned association, and the self-proclaimed largest in the world for advancement of technology is the IEEE. IEEE is an acronym for the Institute of Electrical and Electronics Engineers and they naturally set standards for Electrical and Electronics products and services. Below the reader is able to see the standards development lifecycle that IEEE uses when facilitation such standards.
International Organizations for Standardization (ISO) is the worldwide body that is responsible for developing voluntary International Standards. International Standards help in making industries more efficient and effective by giving up to date and well-defined specifications for products, services and good practice. International standards are developed also assist in breaking down trade barriers, performing a global consensus develops these standards. (ISO.org, 2013) ISO consists of a network of national standards bodies. Its main activity is to develop International Standards. Since the introduction of ISO, more than 19,500 standards have been published internationally. (ISO.org, 2013) These standards cover almost all sectors from Business, Information technology, Safety, healthcare and agriculture. Though many do not realize the impact of such standards, they are embedded in our everyday lives.

**Benefits of ISO**

ISO was created to make sure that product and services are reliable, safe to use and are of good quality. In organizations, ISO standards are used as strategic tools to help reduce costs by minimizing waste and errors. They assist organizations to access new markets and increase productivity. Among the popular standards are ISO 9000 (Quality management), ISO 14000 (Environmental management), ISO 3166 (Country Codes), ISO 26000 (Social Responsibility), ISO 50001 (Energy Management), ISO 31000 (Risk Management), ISO 22000 (Food Safety Management), ISO 4217 (Currency Codes), ISO 639 (Language codes). Each of these standards covers different fields.

**ISO 9000-Quality Management**

A family of standards that cover different areas of quality management; the standards provide tools and guidance to organizations that want to ensure that their products and services will meet with the customer’s requirements. This standard is looked at closely in proceeding sections of this paper.

**ISO 9001:2008**

This is the only standard that can actually be certified to. It sets out the instructions and requirements to a quality management system. The ISO 9000:2008 can be used by any type of organization regardless of its size or nature of business. When this standard is implemented by an organization, its main purpose is to help make

![Image of IEEE Standards Development Lifecycle](http://www.ijmsbr.com)
sure that customers get consistent, good quality products and services. This in return will bring benefits to the organization. (ISO.org, 2013).

**Quality Management Principles**

Altogether, there are eight main principles on which Quality Management System Standards of ISO 9000 series are based on. These principles are used as a framework by top-level management to guide organisations towards improved performance. The eight principles are derived from ISO standards 9000:2005 and ISO 9004:2009 (ISO.org, 2013).

**Principle 1** - Customer Focus, this principle is customer based, Organisations mainly depend on customers and therefore it is important to understand their needs and should focus more on meeting customer requirements and aim to top customer expectations. This in turn leads to increased market share and revenue through quick and flexible response to market opportunities. Customer loyalty is gained and increases in repeat purchases.

**Principle 2** – Leadership elaborates the importance of leader role in organisations, leaders that create an environment within the workplace where everyone becomes fully involved in achieving organisational objectives through unity and teamwork. Communication is improved between different levels in the organisation and employees understand more clearly the objectives and goals of the organisation. Effective leadership creates a clear vision of the organisation's future, at the same time reducing fear and establishing trust.

**Principle 3** – This principle speaks of involvement of people from all levels where everyone collaborates together to make sure that organisational objectives are met.

**Principal 4** – Process approach is where desired results are met more efficiently when resources and activities are managed as a process. Benefits include lowered costs and shorter cycle time, also consistent and improved results are achieved. Process approach leads to clear responsibility and accountability for handling key activities.

**Principle 5** – System Approach to management is when interrelated processes are well identified, understood and managed. It contributes to the organisations effectiveness in achieving its objectives. The benefits are greater ability to focus efforts on the key processes; this leads to a well-structured system and continuous improvement of the system through evaluation and measurement.

**Principle 6** – Continual Improvement should be built in the overall performance of the organisation and set as a permanent objective of the organisation. This benefits the organisation through flexibility to react quickly to seize opportunities.

**Principle 7** – Factual approach to decision making explains that analysis of data and information leads to effective decision making. This in turn leads to more informed decisions made in the organisation.

**Principle 8** – Mutually beneficial supplier relationships forms interdependent relationship between organisation and supplier, this increases the ability of both to create value. In result this mutual relationship leads to clear and open communication and also optimizing of costs and resources (ISO.org, 2013).

### 2.1.4 Quality Excellence Awards

Excellence can be defined as surpassing the standard. In quality, performance is measured against set criteria and recognized using excellence award models. Quality excellence models and awards date back to the first half of the last century. These quality excellence award models are designed to identify superior quality in public and private sectors, for both products and services. Quality excellence awards aim to provide motivation to improve quality and pursue total quality management, to provide a framework to assess quality, and provide a medium for international recognition (Pearson Education, 2010). Several well-known excellence models and awards will be discussed in the following section.

**Overview**

History shows that after Deming returned from Japan in the 1980s that the notion of quality in American would never be the same. After witnessing Japan’s success in the manufacturing industry, the United States
began its own evolution with adopting quality and improving performance. Other countries were not far behind it recognizing what good quality products and services could do for their economies and as such the world experienced a surge in the establishment of programs that acknowledge and rewarded excellence. As quality practices emerged so did total quality management (TQM) and internationally recognized Quality Awards. Initially, many organizations looked at these awards as prestige but realized the connection between their desire to achieve TQM and quality award programs.

As such, this section of the paper looks to provide an overview of specific excellence awards as well as some of the commonalities they are share. Those awards are the Malcolm Baldrige National Quality Award, The Deming Prize, the EFQM (formerly known as the European Foundation for Quality Management), the HH Sheikh Khalifa Excellence Award (SKEA), and lastly the MEED.

**Award Comparisons**

When one looks at these awards, they will find a large number of similarities in the award descriptions and common award criteria. For one, the objectives are centered on the improvement of performances, practices and/or capabilities of their respective country’s organizations.

Secondly, each award’s quality principals recognize the importance of continuous improvement, customer focus, “empowering employees”, and strengthening relationships with external stakeholders to name a few. The criteria are equally similar. However, in the Deming Prize there is no explicit mention of Leadership or Customer like the others though policy, organization and helpful supervision is referenced. Some of the differences are mainly related to the point allocation

**The Deming Prize**

The Deming Prize is the most established, of all the Excellence Awards, and was established in Japan back in 1951 by the Union of Japanese Scientists and Engineers (JUSE). There is no model framework for organizations to prioritize with. However, the evaluation criteria are comprised of 10 points each with a weighting of 10 to equal the 100 percent organizations are to strive for. The 10 points correspond to the following: policies, organization, information, standardization, HR, quality assurance, maintenance, improvement, effects and future plans.

**Malcolm Bridge National Quality Award**

The Malcolm Baldrige National Quality Award (MBNQA) originated in the United States in the mid-1980s when it was realized that American based organizations needed to focus on quality if they were going to be able to continue competing against the likes of other world powers.

The mission of the MBNQA is to improve the competitiveness and performance of U.S. organizations and its vision is to be the partner of choice for excellence in every sector of the economy (Balridge Performance Excellence Program, 2012). The National Institute of Standards and Technology (NIST) currently administer the award, with ASQ assisting with the application review process, preparation of award documents and administrative duties.

**European Foundation for Quality Management (EFQM)**

The European Foundation for Quality Management (EFQM) was established in 1988. Like the MBNQA, the EFQM wanted to supply Europe based organizations with a means to gain leverage over the global market. EFQM’s mission is as a European Foundation, we inspire organizations to achieve sustainable excellence by engaging leaders to learn, share and innovate using the EFQM Excellence Model (See Appendix C). Their Vision is a world striving for sustainable excellence. Their learning, creativity and innovation model that many have emulated is below and they are due to revisit this model as they do every three years. They state that the new model aims to focus on the day and age we are in today, where most of the world is in economic recovery (EFQM, 2013). Though they have yet to release the new model, EFQM does indicate that the new model will be more comprehensive for management to implement and more attention to risk management will be paid.

In figure 6, the reader can view the EFQM Excellence Model which is one of the most popular quality tools used in Europe and is utilized to improve performance by more than 30,000 organizations. The model was
designed to encourage self-assessment and reflection. Additionally, it was designed on a macro level so that the “big picture” of quality management is always kept in mind. Overall the EFQM Excellent Model encourages organizations to adopt dynamic corporate structures versus rigid ones to ensure organization adaptability.

Figure 8: EFQM

Sheikh Khalifa Excellence Award (SKEA)

Like the others, the Sheikh Khalifa Excellence Award provides national organizations with a framework which is composed of criteria against which an organization’s performance will be assessed. Its model is also comprised of “enablers” and “results” which suggest the many different ways an organization can achieve lasting excellence in delivering quality to its stakeholders.

In order to enter into the running, a company must initially do a self assessment, followed by a feedback report which is carried out by an assessment team representing SKEA. At the time of this report, SKEA website was under construction whilst stating that their model was being transformed. However in figure 7, the reader is able to view their model with is taken from EFQM. Major enhancements to the model are done every 2 years which is different from the every three years done by the EFQM Awarding body.
2.2 Vocational Education and Training Sector

There is and has been an abundance of confusion over the definition of vocational education and training due to the sheer size of the sector. Questions such as where VET is delivered, who is considered a VET student and what conditions VET can be offered in, surface when trying to devise a definition that is acceptable by all. In light of this, section 2.2 will approach VET’s definition by looking at education as a whole. Following this will be a definition taken from a number of reputable sources followed by a description of the existence of VET within the United Arab Emirates, which is currently where the writers reside. Through these steps the definition of VET as well as the previous questions will be answered.

Description of VET Sector & Emirates Qualifications Framework

As mentioned in this paper, part of every country's education reform program, must pay special attention to the vocational education and training sector (VET) if a country is to thrive. Vocational education is a training process that provides knowledge, skills and work habits about a particular work in accordance with the technological developments. It develops the capabilities of individuals in various aspects (Tufan, 2013). VET can come in many forms of the within the educational process inclusive of within an organization, at a secondary school level or in higher education. Whatever the context, it is vital that investments to this sector are made as early in a country's development if it’s workforce is to be prepared to meet the needs of future employers and the country’s economically requirements.

A great example of a country that has been extremely responsive to the call for a strengthened VET sector is the United Arab Emirates (UAE). Though the formation of the UAE only came in 1971, the education sector already accounts for about 24% of the total government expenditure and has an estimated market size of US$7.31 billion (Slideshare, 2012). Furthermore, the UAE has been injecting significant funds into the development of research programs and vocational schools that are designed to meet sector-specific industry needs (UAE Ministry of Economy, 2013).

At present, the UAE is steadily emerging as a global leader as they continue on their journey to diversify the economy. Whilst strives are made to be less reliant on the Oil & Gas Sector, many other sectors have been targeted to play a key role in the diversification strategy. Listed within the countries strategic plans is the Education and Technical, Vocational Education & Training (TVET) sector and as previously mentioned has obtained a lot of governmental support. Tremendous progress has been made within the last decades and the biggest leap made in this sector, in recent years, has been the introduction of a National Qualifications Framework.
Authority (NQA), says the executive director of the National Institute for Vocational Education in Dubai. This will allow once unaccredited vocational qualifications to obtain accreditation (The National.ae, 2013). The latter is referenced as part of the NQA’s responsibility is the creation of a national qualification framework (UAEQF) which will allow vocational qualifications to be offered from level 1 to level 10. Figure 7, illustrates where vocational qualifications are in alignment with traditional education qualifications. This framework answers the question to where VET can be offered as well as who are the students of vocational education. As we see in the table VET can be delivered in general education, higher education and for those who are life-long learners. The latter covers a diverse and wide range of adult and school aged students. For the purpose of this research, we will refer to VET in the context of general and higher education mainly.

**Figure 10: QFEMIRATES (National Qualifications Authority, 2013)**

Another reason why the development of a UAEQF is so great for the UAE society is because up until recently about 25 percent of Emirati males have not completed secondary school and many from the field know that vocational training may be the key to providing an alternative route to mainstream education. This means that VET can also be an excellent solution for school leavers.

**Challenges in VET**

It is certain that VET has made its way onto the national stage but it will still require those in the field to continue working tirelessly to maximize the participation of Emiratis. In order to do this, changing the misconceptions that are associated with studying VET and working in a related field is one of the first undertakings. Though the region is experiencing a shift in thinking, as it relates to those who opt for a vocational related job, misconceptions still exist with regards to these type occupations. Some still associate that study VET will result in a job that offers lower pay and is less respectable. Much has done to change the mindsets of the masses and much of the youth, as pictured below are recognizing that VET can be as or more rewarding than any other type of education.
In summary, VET is offered at different levels of educational systems and in a variety of educational settings. Any effective definition of the VET sector depends critically on the types of training that are ‘ruled in’ or ‘ruled out’ but at a conceptual level, any training of vocational relevance (that is, employment related could be considered to form part of the VET sector (Australian Government Productivity Commission, 2011).

2.3 Quality Management in VET

As discussed in previous sections, there have been many efforts made to transform VET into a sector that can service a diverse population of learners. It continues to receive attention in many parts of the world and in this section we will look at the concept of QM in vocational education as well as vocational institutions. For the basis of this paper and the readers understanding, QM in vocational education can be looked at as a process or a product of training. This and proceeding sections of this research focused on the process in which the service of training is delivered. If we were to look at the product of training, we would have to look at both quantitative and qualitative data that relates to VET graduates and employers which we did not.

Quality Management in VET

Firstly, implementing quality management in education is critical as it assists with the facilitation of education reform efforts. Much of these efforts around the globe seek to transform VET from merely a second choice option for school dropouts to a place where specialized, in-demand skills are available for its learners. With this regards, it has been increasing critical for Vocational Training Institutions (VTIs) to adopt quality management systems that ensure the delivery of training produces a graduate that is needed by industry. This approach of ensuring that the teaching and learning will meet standards that are in demand, transforms QM into a process. As noted in “Quality Management in Vocational Training: The Use of Standards and their Different Applications”, there are eleven key aspects of quality management in the educational processes. These are (1) Customer Centered within the context of services and process means the student and in many cases the teacher/trainer. (2) Quality policy, (3) Responsibility, authority and communication, (4) resources provision
and management, (5) competent human resources (6) infrastructure and working environment, (7) product planning and realization, (8) design and development, (9) buying process, (10) control of the follow up and measuring devices, and (11) customer’s satisfaction (Zuniga, 2004). As we are dealing with the processes, the publication also highlights those ISO 9000:2000 refers to this.

Quality Management Systems in VET

As we look at the quality management of processes, the research shows that the implementation of a quality management system needs the adopting and implementation of a number of key basic fundamentals. One of the first principals that must be present is a clear vision of what the customers wants in order to exceed their expectations. A second fundamental is continual improvement of the activities carried out by the institution. The third is the need for clearly defined and equally consistent processes that offer a guarantee that the processes will be the same every time. A fourth is similar to the previous in that the quality of the training services is apparent in the processes. The final fundamental that a QMS must have is the presence of preventative measures as this in itself has implications of the bottom line cost related to doing work over (Zuniga, 2004). As indicated in the same article, a byproduct of this is the adoption and of the following principals in which many VTI's have embedded in their systems. These are a commitment to the direction, team work, the notion that quality takes everyone, decision are based on the facts and a systematic way of correcting issues and making the necessary improvements.

Part B: Underpinning Theory of Case Studies

In Part B, the writers will uncover theories, terminology, and concepts referenced in two case studies presented in Section C. Terms such as TQM, quality management, quality services, licensure and accreditation standards as well as the assurance of quality (QA) are those mainly covered. Lastly, through this section the reader will have the opportunity to gauge the differences between some of the terms that are often misinterpreted and misused for the basis of making clear the steps to implementing quality within VET institutions.

ISO 9000- Quality Management (QM) and Total Quality Management (TQM)

Within case study one, “Total Quality Management in Vocational Education and Model Proposal to the faculty of Vocational Education”, two key concepts are highlighted; ISO 9000 Standards and TQM. Because specific other ISO quality management standards were not mentioned in this case study; ISO 9000 certificate for an education or training organization will be the focus. In the second case study, “Assuring quality in vocational education and training; the role of accrediting VET providers” terms such as accreditation, outcome standards & targets and QA, are used to focus the reader on the European Union’s attempt via The European Centre for the Development of Vocational Training, to assure quality in VET across countries that at one point were solely responsible for their individual country.

ISO Certification for a Vocational Training Institution (VTI)

Firstly, it is important to note that though upholding quality in VET is not new to those working in the sector, the usage of international standards was only first documented in the early 90’s. As covered in the standards section of this paper, ISO provides well-defined specifications for products, services and good practice. In the first case study, Selcuk University proposes utilizing ISO 9000 quality management standards to ensure their services of vocational training are safe, reliable and of good quality (Van den Berghe, 1997). These standards relate to quality assurance. ISO 9001 relates to quality systems in which quality assurance is the key concept used. Though this is the case it will be vital for the university to consider this implementation closely as many practitioners in the education and training world don’t agree that implementation of such standards are the best route for improving quality within the “realm” of education and training (Van den Berghe, 1997).

Though this research is not focused on the reasons why the latter may be the case, one reason for this may simply be due to what it means (Van den Berghe, 1997) or an institution to have an ISO 9000 certification. As relayed in “Application of ISO 9000 standards to education and training”, a certification means, “conceptually”, provides assurance that a VTI is well organized and that the objectives of the programs meet the
needs of the learners. With this in mind, it does not guarantee that the curriculum meets educational standards which we will later discuss in the “Licensure and Accreditation Section” of this research.

Another consideration for obtaining certification will call for the university to choose a credible certification body to certify them. This will be an external body that will facilitate aspects related to obtaining initial certification. It is important to note that ISO does not certify VTIs themselves and it is advised to find an accredited third party to do this. Additionally, the latter will be charged with carrying out conformity assessments, audits and inspections to ensure the quality standards are maintained.

Licensure & Accreditation

In the second case study, the EU addresses service standards framed in the form of Licensure and Accreditation. In most parts of the world, obtaining accreditation is essential if an educational institution wants to be deemed credible and ultimately remain in operations. Accreditation is an evaluation tool used by a third party to recognize that a school or program meet predetermined standards. For the basis of this paper, one insert from the United Arab Emirates (UAE) Commission for Academic Accreditation’s (CAA) website states that accreditation is to assure prospective learners, their families, and the public that technical and vocational education and training programs offered by institutions licensed in the United Arab Emirates meet appropriate standards and international best practice (Commission for Academic Accreditation, 2009). “Assuring quality in vocational education and training: the role of accrediting VET providers”, notes that experience gained since 1970 shows that the time is ripe for turning accreditation into a driving force for improving – and not only assuring – the quality of VET. (“Assuring quality in vocational education and training; the role of accrediting VET providers”, 2011, page 9) This study goes on to note that accreditation stands out as a key instrument for ensuring requirements have been met and for systematically strengthening common trust and improving learning provision. In summary, the aim of accreditation, of a VET program or provider, is to certify that the requirements set by the accrediting body and other standards of quality are being met. Though both definitions stem from different parts of the world, it is evident that accreditation acts as a framework in order for an institution to meet predetermined standards that in most cases are recognized both internationally and nationally.

Licensure

In all of the VET systems researched and outlined in this paper, accreditation can only be sought after licensure has been obtained. Licensure applies to the entire institution and all its activities. In the UAE, in order to be licensed, the institution must meet eleven standards and their criteria that cover all major activities. Licensure signifies that the institution has a mission appropriate to their level of education and possesses the governance structure, by-laws, regulations, policies & procedures, physical and financial resources, academic programs, faculty and other personnel and quality assurance measures sufficient to accomplish its mission (Commission for Academic Accreditation, 2009).

Benefits of Accreditation

Through the various definitions presented in this paper, one can conclude that accreditation is all about the QA of service standards. Unlike ISO, which focuses “conceptually” on if an organization processes are well organized, accreditation looks to evaluate education programs, content, and curriculum to assure that the content meets international standards. Accreditation is defined as the process whereby an agency or association grants permission to teach these programs. Some of the main benefits that accreditation does for a VET institution, its learners and graduates are that it affords the opportunity for continuous improvement within the school and its programs. For learners, it provides an indication that what they are studying will have a positive impact on their skill, knowledge and application levels. For graduates, it means that what they have studied is relevant and that they enter into the “World of Work” ready to operate at a certain level.

Concept of TQM

If Selcuk University is to achieve TQM it will first have to demonstrate that they have met both service/product standards as well as quality standards. After this is achieved it can look to at TQM and its characteristics such as strategy, use of data and attention to the culture of organizations. TQM can improve and increase productivity, retain employees, improve profits and sustain an organization. It is an integrated drive by
all stakeholders, on all levels, with the focus on quality, performance and continuous improvement in increments. This can be accomplished by the organization acknowledging and communicating that employees must be afforded the opportunity to learn new skills and update old skills followed by practicing of those skills. This acknowledgement communicates the message that the people in the company are the ones who must be informed and empowered to correct ineffective systems and procedures to maintain them.

Also, the organization must acknowledge and communicate that problems usually result from people routinely doing work that should never be done in a meticulous manner. Lastly, an organization should acknowledge and communicate that ambiguity and lack of what Crosby termed "conformance to requirements" create roadblocks to TQM (Deming, Juran & Crosby: Contributors to TQM, 2013). In the context of this VET, it will be important that the university understands the need to improve their processes and adapting Deming’s 14 points of TQM to suit their entire school.

The Benefits, Practices and Challenges of Introducing TQM

Since TQM is a description of the culture, attitude and organization of a company that strives to provide customers with products and services that satisfy their needs comprehensive benefits will be expected. However, the learning of new practices and the challenges of change must also be considered and planned for. The culture requires quality in all aspects of the company's operations, with processes being done right the first time and defects and waste eradicated from operations (Tewari & Dias, 2010).

The benefits and basic practices of introducing TQM into an organization are that it enables the company to plan, or design a quality product and/or service that customers want or need, develop processes and systems that reduce waste and increase quality whilst decreasing the cost of production.

Another advantage is that a company can do or put the plan into action and seek ways to do things better to survive and thrive in the competitive market. Additionally, organizations can set up checkpoints along the changes such as giving employees the proper tools to do a good job. Lastly, TQM allows for managers to be able take action when they see the changes that need to be made. The challenges begin with the fact that TQM brings about a change to the organizational culture and change takes time. It is often met with resistance and requires commitment, perseverance and that managers make difficult decisions to remove people who are a clear threat to the organization implementing TQM.

Section C: Case Studies

Case Study One: TQM in Vocational Education and Modal Proposal

The following cases studies indicate that education continues to rank markedly high as areas of development for nations worldwide. Perhaps as equally as important is the need to improve the quality of education being offered in order to meet internationally recognized standards. The concept of quality in education has been evolving since put forward by Deming. Nations need certain knowledge, training and skills in their workforce in order to achieve economic success. Because of this importance, a well-planned quality framework needs to be in place so skills are competitive and indoctrinated along a set of standards. Moutney & Navaratnam argue that in an internationally competitive training environment, implementation of Total Quality Management (TQM) in Vocational Education and Training (VET) can provide a comparative advantage in preparing the quality workforce required for micro and macro-economic reforms (1993). Higher education institutions within burgeoning countries, particularly across Europe and Asia, have recognized this advantage and are progressively implementing quality management systems (QMS) within their organizations. Over the last two decades, initiatives aimed at identifying and implementing best QMS into institutional practices particularly in government-funded organizations have steadily grown. Astute research relating to the said topic has also grown particularly through case study analysis including TQM in VET institutions. Researchers seem to agree that while understanding QMS and TQM is relatively simplistic its successful implementation is not so easy. Likewise, research indicates that one significant hurdle is the lack of a common and agreed upon understanding about TQM and its application.
Analysis: A Case Study Approach

Melek Tufan and Serife Mizrak, professors at Selcuk University in Konya Turkey, compiled a case study in 2012 relaying how their VET institution could be restructured over the long term to 'meet the expectations of society on learning to learn and how higher quality vocational education could be obtained by implementing Total Quality Management within their own organization'. Their study sought to 1- highlight the purposefulness of TQM in HE institutions across Turkey, 2- breakdown (in stages) the steps to implement TQM, and 3- indicate key success factors and barriers to a successful implementation on a rudimentary level. Their case study focuses on their model proposal rather than the models outcomes, its usefulness can be ascertained if it is used primary as a guide to TQM application in its most preliminary stages.

Their proposal is based upon guidelines and stipulations from the Total Quality Management at Institutions Booklet which outlines Quality Management Systems in Basic Education. They present the key benefits they consider a TQM implementation would possess not only for their university but other state-owned institutions across Turkey. TQM within the context of this case study is defined as an improvement in quality in all processes in an organization, wherein all employees actively participate in the improvement initiative therefore achieving customer satisfaction through such improvements. Active participation is defined as being 'quality conscious through a leadership spirit'. Active participation is furthered by organizationally supported activities furthering employee involvement and education. Tufan and Mizrak (year) concluded based on these definitions that the overall quality in their HE institution in Turkey can be realized if a genuine TQM process is implemented and enforced through a systematic approach and if employees behind its success are well trained active participants in the process.

Implementation Strategies – TQM as a best practice

The study indicates nine stages, as proposed by its authors, by which a TQM system could be implemented to build a strategic framework. While such planning is not a new approach (Sutcliffe and Pollock, 1992; Crumrine and Runnels, 1991; et al.) it is a best practice. Their research aim was to thoroughly plan the implementation process in order to mitigate potentially poor performance further along. This is an important directive because typically when TQM efforts do not meet expectations, it is often because of poor tactics and lack of a strategic framework (McCormack, 1992). This key element within the study can be applied on the whole for any institutions seeking to implement a QMS as part of their organization. This process is supported by Crosby's work which promotes a prevention process in a QMS implementation.

Tufan and Mizrak found that the TQM system was a good choice for their institution and we believe that their findings hold merit for most HE institutions as well. Many of the benefits of implementing a TQM philosophy in vocational education programs are the result of attitude change and teamwork (Lankard, 1992). This must be coupled by a strategic framework built on a set of standards driven to improve quality. We believe that since TQM consists of improvements in service, employee efforts and across an entire organization, it is a reliable system with acknowledged benefits that could be implemented in VET institutions.

Furthermore, what remains evident is that the importance of quality in vocational education is becoming increasingly realized worldwide as this case study highlighted. Societies are quickly moving towards being able to provide and sustain skilled labor at the national level. As such developments in the learning process continuously are being scrutinized in order to bring forth overall improvements in quality.

Recommendations include: 1) Continuous improvement needs to be embodied and embraced by all organizational members in order to achieve optimal success in total quality management. 2) Management should develop a quality system, TQM or otherwise, that includes all involved, and works towards setting high standards for workforce skills.
Case Study 2: Assuring Quality in Vocational Education and Training

Background

Across Europe there have been a progressive changes initiated to improve quality assurance in education institutions in effect to promote transparency, understanding and trust among European member and individual states. Illustrative studies have found widespread differences in quality standards between countries and sectors. Specifically research of VET institutions, particularly those within different European countries, found that each had quality initiatives related to the European qualifications framework but not entirely. Most recently VET institutions in Europe have been intensifying their quality efforts through national and foreign accreditation systems in order to build program recognition. This is a recent shift and although it is deemed early to make sound conclusions, early research indicates that VET institutions seeking accreditation are more bound to cooperate with one another. This is an overall improvement in quality but long-term studies have not yet revealed how this shift will affect VET institutions since predominant changes still exist in accreditation systems. This problem was studied by Cedefop, the European Centre for the Development of Vocational Training. In 2011, their case study analyzed the role of accreditation of VET providers within the framework of assuring quality in training provisions.

Problem and Implications

In certain European countries like Denmark and the United Kingdom, accreditation is compulsory, while in other countries it is voluntary. The objectives for seeking accreditation significantly differ; however, in order to gain public funding successful accreditation is a must. While this provides strong incentives for VET providers to get accredited, the process of accreditation differs along key aspects at the national and sectoral level. Over the last ten years, European policy amendments have been brought forth to ensure quality was initiated as a series of policy changes have been enacted across educational institutions on the whole including those concerning vocational education and training.

Undertaking an in-depth analysis constructed from case studies conducted through questionnaire interviews in seven member states and their analysis of approaches across four sectoral accreditation systems, Cedefop's findings conclude that there are sufficient parallels between the national and sectoral accreditation process to move forward with a common systematic strategy for accreditation in VET.

The Cedefop group performed research that focused on two mechanisms set up to assure quality in VET in Europe: outcome standards and targets, and accreditation. While the two mechanisms are intrinsically related, standards precede accreditation since VET providers are evaluated against a predefined set of standards prior to being accredited. As such, their study focused on the similarities and differences within the process of accreditation. These findings offer insight into both the challenges and opportunities for VET providers across Europe, offering widespread suggestions for VET institutions worldwide. Cedefop in earlier research indicated that accreditation of an educational and training provider is the process of evaluating quality assurance against predefined standards (2008). Accreditation is namely based on targets that are used by authorities to measure how effectively resources are used and also whether VET providers deliver services that were previously agreed upon. Accreditation is thereby the formal recognition that a body is capable of executing specific tasks; as such both service and quality are recognized and awarded. A primary challenge going forward is to develop accreditation into a voluntary driving force for improving quality in VET institutions.

Cedefop studied the accreditation systems at the national and sectoral level finding that both were characterized by strong, networked quality and legal frameworks. The set of common principles, guidelines and tools developed by the European forum on quality in VET known as the Common Quality Assurance framework (2002), were not uniformly used. These frameworks are useful particularly because they are continuously modified in order to improve their methodologies and VET providers, applying for accreditation, can easily access detailed information such as application tools and guidelines online.
The overall process of accreditation at the national and sectoral levels showed some noteworthy differences. For instance, accreditation processes had either a government or external body charged with the responsibility of carrying them out. Furthermore, successful accreditation remained valid for differing periods of time, typically for a period between one to five years. Renewal was pooled with interim monitoring known as regular surveillance at the national level. This same process was not true on the sectoral level. The average duration of the accreditation process in the sectoral process varied between one and 15 months in comparison to national accreditation, which was shorter and lasted between 15 days and 12 months. Penalty and rewards serve as respected consequences for VET providers; rewards are given to those who met the requirements and targets, which could also lead to increased public recognition and additional funding. Failure to meet given requirements could lead to lose of accreditation, which could prevent the VET provider from receiving support and funding, or from delivering recognized training. Sectorial frameworks apparently fostered quality standards yet national systems did not.

Other and perhaps more significant differences between national and sectoral approaches indicated major limitations and challenges for each. Analysis of the national quality frameworks in the seven states indicated that requirements for internal quality management systems were often not fully operationalized. Furthermore, while national accreditation systems applied a broad list of criteria against which provider organizations were evaluated, within the sectoral study, the number of accreditation criteria was quite narrow. However, overall results of analyzed accreditation systems pointed to the following: systems were widely accepted by VET providers and quality delivery of VET could be assured. This indicates that although there were differences in approaches, quality through accreditation could be firmly established and meeting the standards was positively received by institutions.

**Developing quality through accreditation**

On the national level, many VET and HE institutions in the different countries recognized these differences and deemed them problematic. Interviews, within the study, procured that respondents believed a unified system across Europe was needed to bridge the gaps. They expressed that VET institutions should have authority over themselves within a framework of standards. They did not want to feel total government ascendancy. According to the CEFOP, there are four crucial factors needed: links of the VET sector to the employment system, involvement of stakeholders, increased regional cooperation and, measurement of output and outcomes by a relevant set of indicators. There are many ways to develop accreditation systems as a means of improving quality in VET. Namely, implementation of an internal quality management system by VET providers, quality objectives that are continuously evaluated in place for both VET providers and VET systems, and bridging accreditation and quality closer together, to overcome existing bias in accreditation systems.

While accreditation is a primary means of ensuring quality, a common systematic strategy on accreditation in VET, entrenched with uniform cooperation for quality assurance, and a comprehensive set of requirements to enhance internal quality management measures within VET organizations, could effectively build quality. The value (of quality) extends beyond VET institutions having a potentially profuse impact on society. Furthermore, as the quality improves so does the reputation of providers of VET. Accreditation thereby serves as a key mechanism in ensuring requirements are met while systematically strengthening and improving learning provisions in VET institutions overall.

**Conclusion**

**Purpose**

The primary aim of this research was to unearth what quality management in the VET sector means to different countries, societies and vocational institutions within a variety of context. In order to do so, a holistic approach was taken to define quality and some of the main concepts associated with its implementation and assurance. Another objective was to gauge the concept of quality management in VET. Thirdly, this paper
looked to disseminate what was uncovered in the analysis of two case studies that were at different stages of their journey of implementing quality management in their respective VET settings.

The basis of this research evolved due to a number of challenges that VET is faced with around the world. Uncovered during the initial stages of the research was one of these issues that linked poor quality in education to low literacy rates around the world. Another problem was how the absence of quality in the VET sector can have a detrimental impact on an individual, a society and even a nation. A third revolving, problematic topic of discussion was and still is that VET Providers are not providing industry with graduates that meet the needs of their employers.

Summary of Findings, Implications, Recommendations

In the first sections of the paper the writers conducted a literature review, defined key terminology and looked at some of the early philosophies that have shaped quality management into what is known today. Also present in the first section, is descriptions of quality frameworks and methodologies, quality standards, and quality excellence awards. The last two sections, 2.2 and 2.3, are a description of the VET sector and an overview of QM in VET. In Part B of the paper, the writers have presented underpinning quality concepts that relate to two case studies later presented in Part C.

In order to further investigate current issues related to QM in VET, this paper looked at the history of quality and definitions of quality concepts. In section 2.1, the literature review showed that when defining quality it is important to put it into context depending on the organization type. Generally, it was found that at the core of the definition is the customer which in the case of VET is the student. Also in this section, QM was defined as a strategy or management tool that requires the full commitment of an organization. Conceptually, components of QM encompasses looking at quality philosophies, systems, frameworks & methodologies, standards and excellence awards and clearly determining what they mean to one’s organization. Furthermore, as a system quality management was found to reduce and/or eliminate nonconformance to specification, standards, and customer expectations in the most cost effective and efficient way.

In section 2.1.1, a number of philosophies, concepts and those who played pivotal contributions to quality management were looked at. The writers concentrated on TQM which at the core of its definition means an approach to long-term success through customer satisfaction. To ensure this definition was comprehensive to the reader, a breakdown of TQM translated in “total” which means “company-wide”, “quality” which is defined above, and management which refers to everyone managing their job effectively and in line with pre-communicated needs. Another prevalent part of this section included the relation that the major contributors of quality have played throughout the evolution of quality. Deming’s statistical approach was dissected and his 14 point plan to TQM was presented. Also discussed in relation to Deming were his contributions to the PDSA cycle which was originally created by Shewart. Other quality practitioners included Juran with his development of the “Juran Trilogy; Crosby, and his concept of “Zero Defects”; Shewhart and his statistical methodologies in QMS and others who made a huge impact on the quality management.

In section 2.1.2, descriptions about quality management frameworks and methodologies were offered. A focus was made on the explaining the different aspect of Six Sigma as its definition has evolved since its original inception. In this section, the reader was able to read how Six Sigma is often referred to as a problem solving methodology, a performance improvement process and its data driven application is aimed at eliminating defects no matter the type of process. An example was given of how, adapted by the writers, was presented on Six Sigma as a problem-solving methodology. Another part of this section was QM Methodologies. PDCA DMAIC, DMADV and RADAR are amongst those covered and how to use them accompanied their definition.

In section 2.1.3, what a standard is, the differences between a quality standard and a service/product standard are explained. Also in this section, multiple bodies and committees responsible for developing standards were looked at as well as a standard development lifecycle. The reader was able to obtain information on ISO and some of the foremost standards and the industries they relate to. Lastly, QM Principals that relate to ISO 9000 series was dissected for the basis of providing details on what this standards means to an organization looking to adopt such.
In section 2.1.4, some of the more famous quality excellence awards were described. In this day and age there are more organizations applying to take part in obtaining an award and the reader has the opportunity to discover what this entails. Awards that were discussed are the Deming Prize, Malcolm Bridge Award, EFQM Award, and the SKEA. Whilst conducting a comparison on these awards, it was evident that many of the objectives, principals and criteria were extremely similar. This is an indication that globally, the world is beginning to agree on what achieving quality excellence means.

In section 2.2, the VET Sector was looked at as there is notably some confusion on how best to define this robust sector. In an attempt to make this part of the project as comprehensive as possible, the writers defined the sector by taking a staged approach to defining education and what VET education means to its learners, graduates, and employers. Also in this section, the UAE VET Sector was assessed with examples of the efforts the government is making to improve quality management in its institutions and its governance bodies.

In section 2.3, QM in VET was unravelled, starting with a stated problem that VTIs are not preparing their learners and graduates for the world of work. Also acknowledged were eleven key aspects that were taken from “Quality Management in Vocational Training: The Use of Standards and their Different Applications, in its plan to improve quality management in the educational process. Here the reader is able to distinguish between what was presented in section 2.1 and what QM means to a VTI.

In part B, the underpinning theories related to the case studies presented in part C were discussed. The research in this section supplied an opportunity for the reader to understand terms such as TQM, quality management, quality management systems, quality products & services, licensure, accreditation, and others in the context of VET.

In the last section, Part C, two case studies and an analysis of both are presented. In the first case study the reader is able to see the path that Selcuk University, out of Turkey, is proposing for the implementation of ISO 9000 Standards and TQM. Because at the time of the research they had not implemented ISO or TQM, readers are able to obtain insight into their planning stage. The second case study, “Assuring quality in vocational education and training: the role of accrediting VET providers” offers a different perspective with the EU’s attempt to standardize accreditation standards and implementation across a number of countries and sectors. By presenting this case study the writers were able to illustrate the steps that were taken during the planning, implementation and reevaluating stages of implementing quality management and assurance in the VET sector.

As stated in the introduction, much of the limitations hinge on the resources utilized and the time in which they were accessed. Another major limitation was the scope of this project which was the dissemination of information related to the QM in VET versus the creation of new information in this sector. Through the research, one is able to soundly determine that QM in VET, in general, has made a remarkable difference to societies across the world.

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