

# Total Quality Management Meta-Analysis: Founders, Awards Criteria, and Successful versus Failing Cases in Higher Education

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## Abstract

The purpose of this meta-analysis paper is to give a clear presentation of the Total Quality Management (TQM) characteristics and concepts applicable to the higher education context. The paper presents the TQM concepts analysed by the founders of the TQM literature. Followed by the meta-analysis of the influence of TQM awards to quality management principles and characteristics. Those TQM awards are attractive to many organizations, including higher education. Consequently, their criteria can reshape the quality management concepts and implementation in organizations when they are granted such awards. This paper uses qualitative meta-analysis as a method of conducting a thorough secondary qualitative analysis of primarily qualitative results. In this systematic review procedure, the literature is reviewed as not only an objective means to combine the results of previous studies but also to compare, classify, and deduce conclusions of the TQM major concepts and the applicability of this model to higher education including successful and failing cases. All of the TQM concepts constituting of the TQM characteristics discussed by the TQM founders and also those TQM characteristics developed by the TQM awards' criteria are analysed from the perspective of the higher education TQM scholars in order to present the applicability or inapplicability of those concepts or characteristics to higher education.

**Keywords:** meta-analysis, Total Quality Management (TQM), founders, awards, higher education

## 1. Introduction

Meta-analysis initially developed in the field of education in a seminal paper by Glass (1976) that was used to synthesise quantitative research in the field of psychology. The supposition of the meta-analysis strategy is that "The findings of multiple studies should be regarded as a complex data-set, no more comprehensible without statistical analysis than would hundreds of data-points in a single study" (Glass, McGraw, & Smith, 1981, p. 12). Thus previous research is considered a type of data in statistical meta-investigation. The need for this type of secondary statistical data is argued by Hunter, Schmidt and Jackson (1982), they discuss its importance in the field of psychology which is "not for additional empirical data but some means of making sense of the vast amounts of data that have accumulated" (p. 27). According to Wolf (1986) and Wood (2000), psychologists consider statistical meta-analysis as a technique that not only offers an objective means of blending the results of previous studies but also moves a literature review to the same standard of repeatability and scientific inquiry as individual research. In fact, meta-analysis was only considered applicable for quantitative studies to be synthesised. Nonetheless, this systematic review procedure was used in qualitative research starting with medicine passing through policy and management research and reaching social science and educational research (Rist, 1990). Meta-analysis in qualitative research is also known as meta-ethnography as a type of ethnographic research (Noblit & Hare, 1988), qualitative meta-data-analysis (Paterson, Thorne, Canam, & Jillings, 2001), or qualitative meta-synthesis (Sandelowski, Docherty, & Emden, 1997). As such, in qualitative meta-analysis the findings of a qualitative literature review are formally mixed for an interpretive result through an analytic process that establishes transparently, comprehensively, and systematically the state of knowledge in a field of research.

This paper uses qualitative meta-analysis as a method of conducting a thorough secondary qualitative analysis of primarily qualitative results. In this systematic review procedure, the literature is reviewed as not only an objective means to combine the results of previous studies but also to compare, classify, and arrive into conclusions of the Total Quality Management (TQM) major concepts and the applicability of this model to

higher education including successful and failing cases as presented in Figure 1. As such, in the first step of the meta-analysis strategy, the literature of TQM founders including Crosby (1979), Deming (1966; 1986; 2000), Feigenbaum (1961), Imai (1986; 1996; 1997), Ishikawa (1985; 1990), Juran (1995; 1999; 2004), and Taguchi (1997) are systematically analysed in order to summarize the theory of each of those founders and create a comparison between the theories for the sake of creating a list of quality management concepts and characteristics. Those quality management concepts and characteristics are then reviewed in the quality management awards like the European Foundation for Quality Management (EFQM) award, the Malcolm Baldrige National Quality (MBNQ) award, the Australian Quality award, Dubai Quality award, and international quality awards like ISO 9001 and Six Sigma quality award. The criteria of these awards have influenced the quality management concepts and characteristics. Those influences are added to the quality management list generated in the first step of this meta-analysis in order to have a synthesized review of the TQM model. After that and through meta-analysis, the studies done about TQM in higher education will be combined and analysed based on both successful and failing TQM implementation examples derived from the literature of defenders and opponents of TQM in higher education.

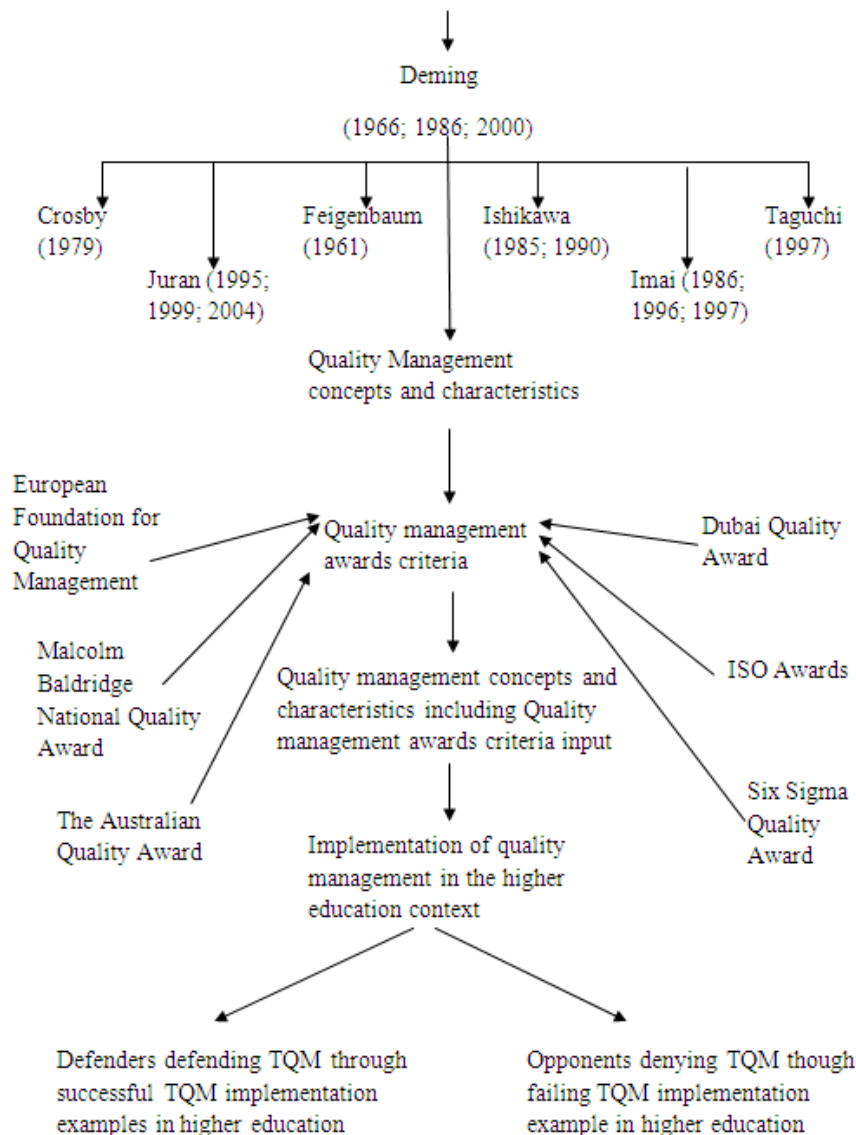


Figure 1. Meta-analysis research strategy

## 2. TQM Concepts Meta-Analysis

This section presents the key TQM characteristics found by the major TQM scholars including Crosby (1979), Deming (1966; 1986; 2000), Feigenbaum (1961), Imai (1986; 1996; 1997), Ishikawa (1985; 1990), Juran (1995; 1999; 2004), and Taguchi (1997). Therefore, the result of this section is a list of TQM characteristics based on a meta-analysis of the basic concepts and principles of those TQM scholars.

Deming's (1966; 1986; 2000) main argument about quality management was based on the plan, do, check, and act or PDCA cycle (see Figure 2). "Plan" is designing or revising-since this is a continuous process-the processes, "do" is the implementation of the processes, "check" is measuring the results and reporting them to decision makers, and "act" is taking corrective action to improve the process or change it. Deming was a statistician, and in the 1950s he proposed his theory based on analysing business processes and measuring them in order to find variation that leads to deviation from customers' requirements of products. Therefore his theory was designed for controlling quality in businesses, and specifically manufacturing, and focused on processes, analysing processes, measuring products, finding variation, and customer's satisfaction.

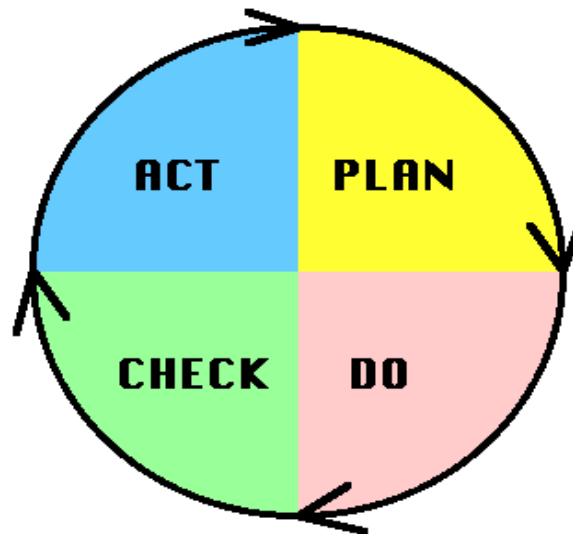


Figure 2. Deming's PDCA cycle (Deming, 1966)

Therefore, we can conclude that the Deming quality management theory also focuses on the following activities: designing or planning processes, conformance to designed processes, measuring results, reporting results to decision makers, taking corrective action, and continuous improvement.

The second founder of TQM discussed in this paper is Juran. Juran's (1995; 1999; 2004) main theory of quality management is presented in the Juran Trilogy: quality planning, quality control, and quality improvement, as presented in Figure 3:

**Quality planning:** this phase focuses on developing processes and products that meet customers' satisfaction. Juran argues that organizations should have a specific goal, and in this stage processes should be designed to reach that goal. There are steps within this stage that Juran suggests, and these are presented as set quality goals, identify customers, determine customers' needs, design processes that will meet customers' needs, and establish processes control.

**Quality Control:** this stage is the implementation of plans, including monitoring operations to study differences between actual performance and required goals. This stage includes three steps: Evaluate performance, compare it with set goals, and take action to resolve differences.

**Quality Improvement:** this stage focuses on improvement of the quality process. It consists of the following steps: Create infrastructure for annual quality improvement, identify improvement project (what is required for improvement), hire project team members with clear responsibility for implementing the improvement project, and provide training, resources, and motivation for the team members to establish improvements.



Figure 3. Juran's Trilogy (Juran, 1999)

The third founder of TQM discussed in this paper is Ishikawa. Ishikawa (1985; 1990) discusses the seven quality tools for quality improvements: flow charts, check sheets, Pareto diagrams, cause and effect diagrams, histograms, scatter diagrams, and control charts. Ishikawa argues that 95% of quality related problems could be solved through these seven tools. According to Ishikawa (1985), the first step to take in order to resolve quality related problems is identifying the problem, and then the appropriate tool from the seven quality tools is used based on what the problem is. The quality improvement team based on the nature of the problem should quickly communicate solutions. Ishikawa is famous for the Ishikawa diagram, as presented in Figure 4. This diagram is also known as the fish bone diagram, herringbone diagram, and cause and effect diagram. It was created by Ishikawa to show the cause of a specific event. It is essentially designed for quality defect prevention.

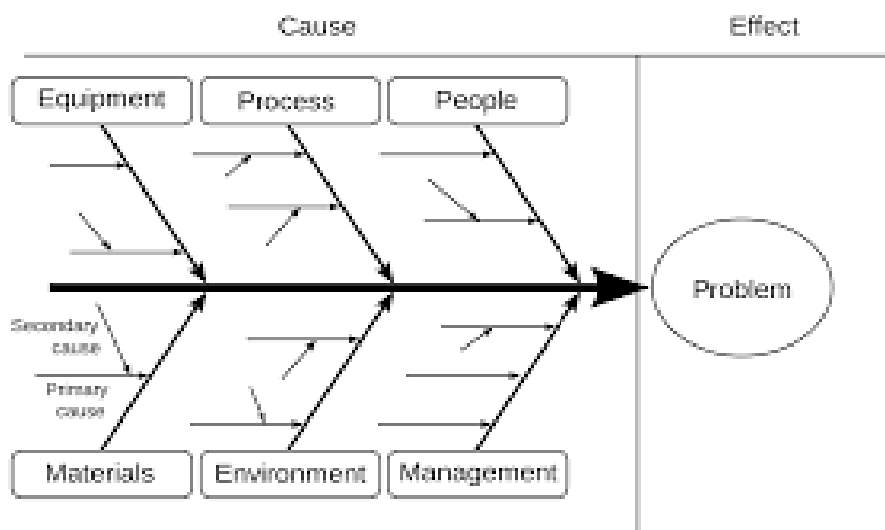


Figure 4. Ishikawa diagram (Ishikawa, 1990)

Quality is everybody's job and thus it may be nobody's job (Feigenbaum, 1961). This is the reason that Feigenbaum gives for the need to manage quality. Although many scholars refer the term TQM as belonging to Deming since he is the founder of quality management, the fact is that this term was coined by Feigenbaum and was never used by Deming or Juran. Feigenbaum (1961) coined the term of total quality control, which was developed to total quality management and quality systems. Feigenbaum proposed to move the concept of quality from the technical processes into management strategy. This move had a role in the proliferation of TQM from manufacturing to the service industry.

According to Crosby (1979), quality is free. This is because when an organization establishes a quality program,

the program will save more in returns than what the organization pays in costs for it. This is also the name of his book that was published in 1979 during the American manufacturing crisis, when Americans were losing market share to the Japanese products because of the better quality of those products. Crosby's (1979) major principle is "doing it right the first time", consisting of the four following principles: 1) Conformance to requirements: those are both the requirements of the product and the requirements of the customer; 2) Quality system is based on prevention of defects before they occur; 3) Standard of performance is zero defects; and 4) Quality is measured by the price of non conformance.

According to Imai (1986; 1996; 1997), organizations can be more successful and profitable when they apply the concept of Gemba Keizen. Imai (1997, p. 43) argues that total quality management requires its own culture where people understand it and gain the required skills gradually over time and this should be done through the Japanese Gemba Keizen concept. "Gemba" in Japanese means "the workplace" and "Keizen" means "continuous improvement", which is a method of management based on changing one thing at a time (Imai, 1997, p. 43). This means making simple improvements to processes. According to Imai, greater productivity is the result. The major feature of this concept is its low cost, just-in-time production, connection between policies and execution, process orientation, belief in consensus decision-making, and belief in the value of employees.

Taguchi (1997) contributed to the improvement of the quality of manufacturing through applying a statistical methodology in studying product variations from the standard requirements.

In summary of this meta-analysis of the TQM concepts, there is no contradiction between TQM founders in their quality management principles, but each of them focuses on some points more than others and adds its own input. Table 1 summarises the main TQM concepts initiated by TQM founders. Those concepts basically include: processes, results, customers, assessment, reporting, continuous improvement, planning, quality goals, strategic management, communication, teamwork, cost, product, and leadership.

Table 1. TQM concepts from TQM founders

	A	B
1	TQM concepts (TQM founders)	TQM characteristics (TQM founders)
2	Processes	-plan processes -design processes -conformance to design -analyze processes -control processes
3	Results	-find variation -measure products -quality Control -defect prevention
4	Customers	-check customers requirements -customers satisfaction
5	Assessment	-assess processes - measure results -evaluate performance -identify problems -conformance to requirements -statistical analysis
6	Reporting	-report to decision makers
7	Continuous improvement	-for processes

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		-for results
		-self improvements
		-simple improvements
8	Planning	-monitoring
		-match performance& goals
		-connection between policies and execution
9	Quality goals	-use appropriate tools to solve problems
		-quality is free
10	Strategic Management	-strategic planning
		-strategic objectives, mission, vision
11	Communication	-quality improvement teams communicate solutions to problems
12	Teamwork	-quality improvement teams
		-consensus decision making
13	Cost	-reduce cost
		-increase value
14	Product	-conformance to standard
		-meet customer's requirements
		-continuous improvement
15	Leadership	-training
		-motivation
		-resources
		-value of employees
		-pride
		-self improvement
		-improvement

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### 3. TQM Awards Criteria Meta-Analysis

Many organizations in the world seek TQM awards in order to prove their high quality products, services, or performances to their stakeholders, regardless of whether those organizations are in manufacturing, services, or even in the public sector (EFQM, 2015). This section reviews the most important quality management awards that are offered in Europe, America, Australia, and the UAE such as the European Foundation for Quality Management (EFQM) award, the Malcolm Baldrige National Quality (MBNQ) award, the Australian Quality award, Dubai Quality award, and international quality awards like ISO 9001 and Six Sigma. They are based on the TQM founders' theories but are analytically reviewed in order to add any of their developed concepts to the quality management characteristics and concepts so as to produce a comprehensive summary of TQM characteristics.

The TQM awards are attractive to many organizations including higher education, and consequently their criteria can reshape the quality management concepts and implementation in organizations that are granted such awards. The awards criteria documents were reviewed based on meta-analysis in order to present their input to quality management principles and characteristics.

One of the international quality management awards is the European Foundation for Quality Management Award (EFQM). The EFQM is very popular, and about 30000 organizations have used it either through winning the award, applying for it, or even just using its excellence model as a self assessment tool for self improvement (EFQM, 2015). According to (EFQM, 2015), 84 % of the EFQM members reported that the award criteria helped them improve their organizations. The president of the European Council explains, "All European organizations, both in the public and private sectors, are facing new challenges. The increasing pressure to

compete on a global stage with limited resources means we all have to work together to secure our future prosperity, and that of generations to come. The EFQM Excellence Model provides a framework that encourages cooperation, collaboration and innovation that we will need to ensure this goal is achieved” (EFQM, 2015). The EFQM excellence model is divided into nine criteria to examine cause and effect relationships between organizations’ performance and the results they achieve. What an organization does is covered by five “enablers” criteria and what it achieves is covered by four “results” criteria as presented in Figure 5. This figure shows the enablers’ criteria including: leadership, people, policy and strategy, partnerships and resources, and processes (EFQM, 2015). In addition to the results’ criteria including: people results, customer results, society results, and key performance results (EFQM, 2015).

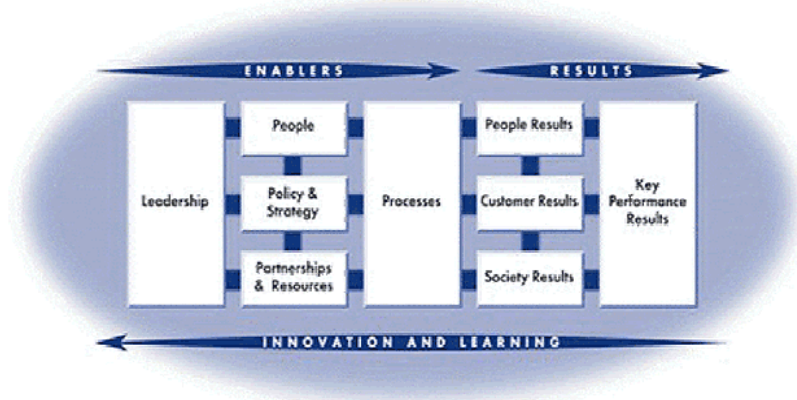


Figure 5. EFQM award criteria (EFQM, 2015)

The high level meaning of each criterion is presented in a clear definition, and there are a number of criterion parts that support each criterion (EFQM, 2015). The EFQM model uses the RADAR logic (see Figure 6) that is based on the Plan-Do-Check-Act (PDCA) cycle of Deming (2000) to assess and score each sub-criterion.

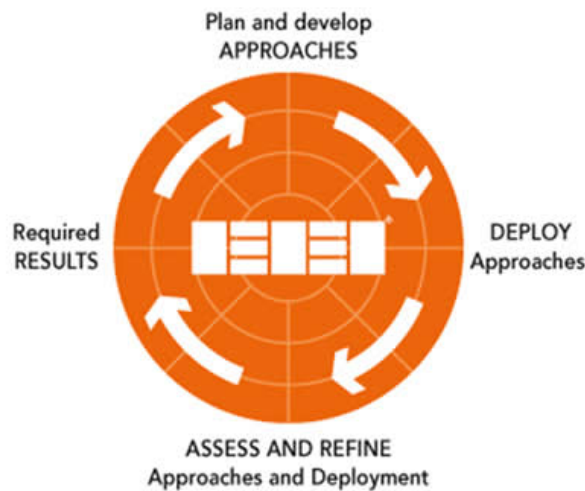


Figure 6. RADAR logic (EFQM, 2015)

According to the EFQM model, organizations should add value to their customers through understanding them and fulfilling their expectations and needs. They should be aware of their social responsibility by advancing the social, environmental, and economic conditions in their communities through improving their performance (EFQM, 2015). The EFQM model also looks to change management capabilities of the organization within and



beyond its boundaries. In addition to harnessing the innovation and creativity of its stakeholders to demonstrate value and a high level of performance as an excellent organisation (EFQM, 2015). According to the EFQM model leaders should be role models for the ethics and values of excellent organizations and should shape the future and make it happen through integrity, inspiration, and vision. Organizations should also manage with agility when identifying and responding to opportunities and threats (EFQM, 2015). Excellent organizations should empower and value their people to achieve their personal and organizational goals as organizations succeed through their people's talents. According to the EFQM model results should be sustained and outstanding in order to meet the short and long term needs of stakeholders within the operating environment context of the organization (see Column C in Table 2).

The Malcolm Baldrige National Quality Award (MBNQA) is an American quality management award that was initiated in 1988. Its purpose is to strengthen the U.S competitiveness, facilitate organizational learning and growth, and share best practices (MBNQA, 2015). The criteria of MBNQA provide a system to help understand performance management for the sake of performance excellence. Organizations can use MBNQA criteria to measure their own performance as if the criteria are a common language between organizations that enhances communication for sharing best practices (MBNQA, 2015). The criteria consist of seven key categories: leadership, strategic planning, customer focus, measurement, analysis, and knowledge management, workforce focus, process management, and results, as presented in Figure 7. Column C in Table 2 below includes those criteria within the TQM concepts.

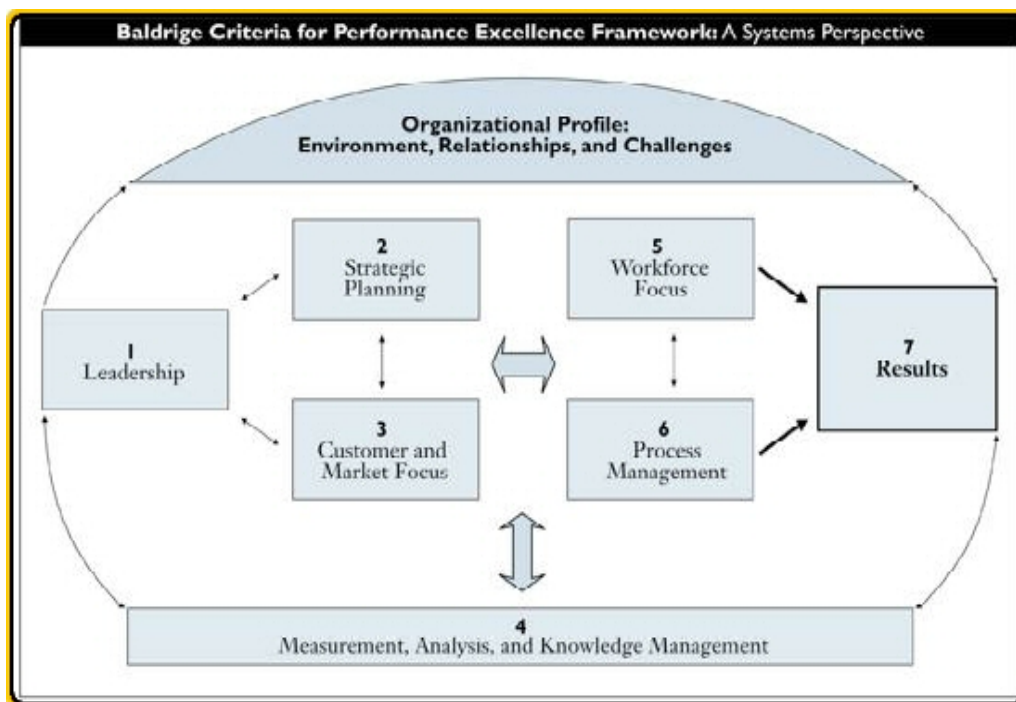
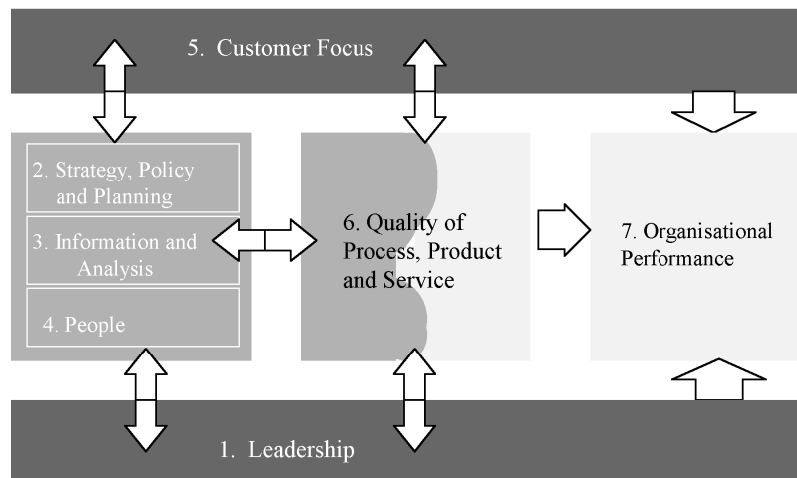


Figure 7. MBNQA excellence model criteria (MBNQA, 2015)

According to MBNQA (2015), the criteria of its model is based on the TQM model summarized by this award body in five points: customer focus, planning process, process management, process improvement, and total participation. All of these are dedicated for the results of the organization. Nevertheless, according to MBNQA there is no single recipe of TQM for all organizations and each organization should implement TQM uniquely.

Similar to the European Foundation for Quality Management and the Malcolm Baldrige National Quality awards, the Australian Quality Award focuses on the main quality management concepts including seven key criteria (see Figure 8). These criteria focus on the following: leadership and innovation, strategy and planning processes, data, information and knowledge, people, customer and market focus, processes, products and services, and business results (Vokurka, Stading, & Brazeal, 2002). Column C in Table 2 below includes those criteria within the TQM concepts.



Source: Australian Quality Awards Criteria (1995), Australian Quality Council, p8.

Figure 8. The Australian quality award criteria

The government of Dubai, UAE and the national Department of Economic Development has launched a number of quality management awards as an effort to improve customer service standards for both the public and the private sectors. For example, the Dubai service Excellence Scheme in 2002 has a high standard of business ethics and criteria for service excellence and is aiming to gain customer's trust and create a pleasurable experience of shopping in Dubai (DED, 2015). Another quality award is The Emirates Quality Mark awarded by the Emirates Authority for Standardization and Metrology as the authorized body in the UAE (DED, 2015). The purpose of this one is to guarantee that assessed products meet the approved standard of export and local markets (DED, 2015).

Furthermore, the Dubai Government Excellence Program award was initiated to improve the performance of the governmental sector of Dubai. It is granted to exceptional initiatives, departments, and employees (DED, 2015). The Department of Economic Development also initiated the Dubai Human Development Award in 2002 that rewards and recognizes human resources initiatives taken by business organizations. This is to achieve the goal of Dubai Human Development, which is not only providing work opportunities for UAE nationals but also develop their abilities and gives emphasis to their role in the development of the UAE through intensive guidance and training (DED, 2015). The Dubai chamber also launched the Mohammed Bin Rashed Al Maktoum Business Awards in 2005 to reward and recognize organizations that contribute to the economic development of the UAE.

There are many quality awards in Dubai, the Dubai Quality Award could be the most interesting award for higher education institutes. The Department of Economic Development of Dubai introduced the Dubai Quality Award in 1994 (DED, 2015). The purpose of this award is to improve the standards of the operating businesses in order to boost internal and external trade (DED, 2015). This award is given to organizations that demonstrate commitment to best practices in their relevant areas. Interested organizations should submit documents that demonstrate high commitment to quality in all respective fields of their businesses. Each submission is reviewed by Dubai Quality Award assessors according to the Dubai Quality Award model. After the assessors' review, a short list of organizations is drawn up. The assessors then visit the short listed organizations and give recommendations for improvement (DED, 2015). The Dubai Quality Award model is based on the European Foundation for Quality Management Award model (see Figure 9).

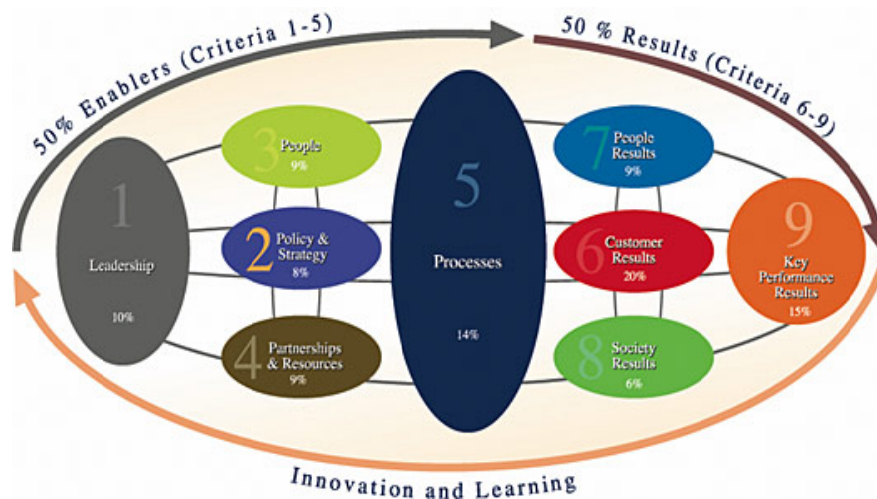


Figure 9. Dubai quality award model criteria (DQA, 2015)

The purpose of the Dubai Quality is to recognize role model organizations and not to select winners and losers according to DED (2015). “It is also a process for providing organizations with a ‘roadmap’ to achieve excellence through the adoption of good practices and soundly-based approaches that are deployed systematically and which are continuously measured and reviewed” (DED, 2015). Column C in Table 2 includes Dubai Quality Award criteria within the TQM concepts.

The International Organization for Standardization (ISO) has a purpose of developing and promoting standardization through a frame-work for fundamental quality management. ISO 9001:2008 provides a definition of good management practices and intends to provide global standards to spell out trust and quality (see Figure 10).



Figure 10. ISO 9001:2008 pyramid (ISO, 2015)

The certification is provided to organizations in all areas like manufacturing, servicing, accounting, legal and financial servicing, computing, processing, and education. “ISO comprises of 91 member countries...The standards were developed to effectively document the quality system elements to be implemented in order to maintain an efficient quality system within organizations” (ISO, 2015). The standards of ISO 9001: 2008 consist of eight sections for auditors to assess an organization including the following:

- 1) Introduction
- 2) Scope

- 3) Terms and definitions
- 4) Quality management system
- 5) Management responsibility
- 6) Resource management
- 7) Product realization
- 8) Measurement, analysis, and improvement

The above section four to eight include the requirement portion of the standard which enables organizations to improve products reliability, have better flow and control of processes, superior process documentation, more employee quality awareness, and a reduction in product rejections and scrap (ISO, 2015). Column C in Table 7 includes ISO 9001: 2008 standards within the TQM concepts.

There are a number of quality management awards. Those have very similar criteria, and each can prepare organizations for other awards. For example, when Motorola used Six Sigma in its quality improvement efforts in the late 1980s, it was then awarded the Malcolm Baldrige National Quality Award in 1988 and was one of the first organizations to be granted this award (Six Sigma, 2015). Six Sigma achieved a lot of popularity in the 1990s after the successful experience of Allied Signal (now Honeywell) and General Electric in implementing its concepts (Six Sigma, 2015). Although the concept of Six Sigma is considered on a broader meaning, the basic idea of Six Sigma is improving processes where there are at least six standard deviations between the worst case specification limit and the mean of process variation. In other words, this means that the process is fundamentally defect free (Six Sigma, 2015). Six Sigma uses similar tools to the Quality Improvement Teams of the 1970s and early 1980s in order to improve processes, and it uses the DMAIC (Define, Measure, Analyze, Improve, and Control) process which is a variation of Deming's PDCA cycle as presented in Figure 11.

### Six Sigma - DMAIC

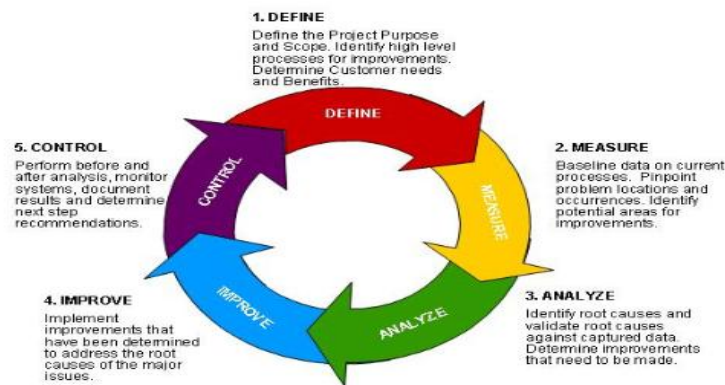


Figure 11. Six Sigma DMAIC process (Six Sigma, 2015)

Six Sigma focuses on the importance of aligning its projects with the strategic business plan of the organization in order to realize breakthrough results (Six Sigma, 2015) through eight steps for successful implementation as presented in Figure 12. Column C in Table 2 includes Six Sigma process within the TQM concepts.



Figure 12. Six Sigma steps (Six Sigma, 2015)

This section reviews the most important quality management awards that are offered in Europe, America, Australia, and the UAE such as the European Foundation for Quality Management (EFQM) award, the Malcolm Baldrige National Quality (MBNQ) award, the Australian Quality award, Dubai Quality award, and international quality awards like ISO 9001 and Six Sigma. Those quality awards are based on the TQM founders' theories but they are analytically reviewed in order to add any of their developed concepts to the Quality Management characteristics and concepts for the sake of having a result of a comprehensive package of TQM characteristics.

Table 2 below summarizes the TQM characteristics designed by the TQM founders as presented in Table 1 along with the TQM characteristics taken from the TQM awards' criteria input.

Table 2. TQM Awards' input to TQM concepts

	A	B	C
1	TQM concepts (TQM founders)	TQM characteristics (TQM founders)	TQM characteristics (TQM awards input)
2	Processes	-plan processes -design processes -conformance to design -analyze processes -control processes	-process documentation -improve processes flow -continuous improvement of processes
3	Results	-find variation -measure products -quality Control -defect prevention	-social responsibility -sustained and outstanding results -meet short and long term needs of stakeholders -results analysis -business results -clear measurement
4	Customers	-check customers requirements -customers satisfaction	-add value to customers -understand customers -customers focus -market focus
5	Assessment	-assess processes	-organizational performance

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		- measure results	-data and information analysis
		-evaluate performance	
		-identify problems	
		-conformance to requirements	
		-statistical analysis	
6	Reporting	-report to decision makers	-report data and information
7	Continuous improvement	-for processes	-improve employee quality awareness
		-for results	
		-self improvements	
		-simple improvements	
8	Planning	-monitoring	-policy and planning
		-match performance& goals	
		-connection between policies and execution	
9	Quality goals	-use appropriate tools to solve problems	-organizations succeed through people's talent
		-quality is free	-knowledge management
			-quality of process, product, and service
10	Strategic Management	-strategic planning	-leaders shape the future and make it happen
		-strategic objectives, mission, vision	-agility in responding to threats and opportunities
			-policy and planning
			-strategic business plan
			-align strategic business plan with the organization's processes
			-prioritization
11	Communication	-quality improvement teams	-information and analysis
		communicate solutions to problems	
12	Teamwork	-quality improvement teams	
		-consensus decision making	
13	Cost	-reduce cost	-resource management
		-increase value	
14	Product	-conformance to standard	-focus on products and services
		-meet customer's requirements	-product reliability
		-continuous improvement	-reduce product rejection and scrap
15	Leadership	-training	-change management
		-motivation	-encourage innovation and creativity
		-resources	-leaders: role model for ethics and value
		-value of employees	-recognition
		-pride	-governance
		-self improvement	
		-improvement	

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#### 4. TQM Successful vs. Failing Cases Meta-Analysis

All the TQM concepts that were collected above and which constitute the characteristics discussed by the TQM founders and those characteristics developed by the awards' criteria are analysed from the perspective of the higher education TQM scholars in this section. This is to present the applicability or inapplicability of those concepts or characteristics to higher education. Columns B and C of Table 2 are combined in one column (Column B: TQM characteristics) in Table 3 to analyse higher education TQM scholars' opinion about the implementation of each of the TQM concepts and characteristics in the context of higher education. In this meta-analysis, each of the 15 main concepts of TQM presented in Table 2 is discussed from both the defenders' and the opponents' points of view and is summarized in Table 3.

One of TQM's basic components is having defined processes and the consistent assessment and measurement of performance with standard processes. Kosh (2003) argues that this cannot be implemented in higher education since standardization in teaching limits professors' innovation in their classes. This study is used to show that TQM has a very small impact on higher education since all of the successful cases were limited to administrative rather than academic departments. Similarly, Moon and Smith (1998) found that TQM improves processes through reducing and answering waiting time for calls in administrative departments but does not cause any improvements in academic departments. According to Antony and Pierce (2002), the processes of higher education are represented in lab experiments, project reports, and presentations, and argues that TQM improves those processes. Mehralizadeh and Safaemoghaddam (2010) are also opponents of TQM in higher education and argue that TQM is not theorized since it focuses on the process of enrolling students rather than what students learn. The research of Sousa (2006) supports this argument by pointing out that there is no one type of best teaching, but it is essential to incorporate different approaches in teaching for optimal learning.

On the other hand, Pike and Barnes (1996, p. 24) TQM helps to improve the effectiveness, flexibility, and competitiveness of higher education institutes. Kanji and Malek (1999) argue that successful results in higher education institutes implementing TQM are the outcome of teamwork, leadership and continuous improvement. According to Schargel (1996), TQM helps in creating well-educated students and therefore well skilled work force when they work in the industry.

Defending TQM in higher education, Reavill (1998) states that the customer is clearly identified as the employer purchasing the output of higher education. This research considers that the student is neither a customer nor a product, but is instead a stakeholder. According to Reavill (1998), the 12 stakeholders of higher education are: students, employers, families and dependants of students, employees in the university and the university, university's suppliers of goods and services, secondary education schools, other universities, industry, nation, government, tax payers, and professional bodies. They are all stakeholders because they either pay for the university or get benefits from it, or both at the same time. This study argues that it is hard to prioritize them but that the first four are the most important. Michael, Sower and Motwani (1997) also defend TQM in higher education and build a comprehensive model of TQM in higher education by defining the customers as three groups (students, industry and community). According to Antony and Pierce (2002), higher education customers are both students and businesses, and the products are "practice knowledge" and "communication skills". According to Green (1994), TQM should focus on improving the quality of programs in higher education since it generates human resources, which he considers to be the products of higher education. Sirvanci (2004) defence of TQM in higher education argues that a secondary student enrolling in higher education should be considered in the same way as raw material that goes through the production process from one step to another until they graduate and become products for employers and compete against one another in the market. On the other hand, Pfeffer and Coote (1991) consider that a student is an "active participant" in education and is not a customer or a product.

Antony and Peirce (2002) discuss the importance of self-assessment in a TQM system by comparing performance to an excellence model for the sake of improvement. Green (1994) focuses on assessing the programs of higher education by assessing efficiency, quality, and accountability since it generates human resources to an organization that plays an essential role in the society. According to Kosh (2003), professors are sometimes assessed at the end of the semester and with TQM they need to be assessed continuously and maybe on daily basis, which is very hard. Wiklund, Klefsjö, Wiklund and Edvardsson (2003) also criticize the assessment of faculty in higher education since it diminishes innovation and creativity. Wiklund et al. (2003) criticizes TQM because it requires a lot of reporting, asks about a lot of details, and takes time to collect statistical data that might not be useful after a short period of time. On the other hand, Evans and Lindsay (2005) argue that when organizations support teamwork, all personal initiatives are taken into consideration, which adds value to the processes and leads to continuous improvement. According to Sirvanci (2004), faculty members are

product focused on research more than they are market focused on students' preparation to meet employers' requirements.

According to Montano and Utter (1999), implementing TQM in higher education is beneficial to everyone in both the academic and the administrative departments. Sirvanci (2004) discusses three reasons that hinder TQM in higher education: old traditions, faculty interest, and lack of team spirit. This research states that old traditions that have been built in education have deep roots that prevent change, especially when changing the whole culture to apply TQM. Antony and Pierce (2002) demonstrate their practice of TQM in higher education institutes through quality function deployment, believing that it balances between teaching and research. According to Schargel (1996), TQM in higher education helps with designing a mission down to gradual improvements even in the classroom and creates intrinsic motivation among students. Sirvanci (2004) identifies some challenges that face TQM in non-profit organizations such as higher education including things like customer identification, leadership, organizational and cultural issues, the role of the student, and performance measures. In a study that he conducted on ten colleges and universities in and around Boston, Entin (1993) argues that senior management usually have a lot of enthusiasm to implement TQM, but faculty resistance creates a huge gap between employers' requirements and academic institutions. According to Mehralizadeh and Safaeemoghaddam (2010), TQM was not socially authorized, especially by higher education institutes professors since it requires more committee work and less individual benefits for them as scholars and less freedom. Brown and Koenig (1993) argue that the major difficulty of TQM implementation in the academic department is that it gets a lot of resistance from faculty since it causes more committee work and less professional benefits.

According to Sirvanci (2004), team spirit is hard to achieve in higher education since departments compete with each others for university resources and this creates an extra challenge for TQM implementation. Teamwork is essential in TQM and this cannot be achievable in higher education according to Kosh (2003) since committees try to hinder work in higher education more than they just work at getting it done. Mehralizadeh and Safaeemoghaddam (2010) take the same view as Kosh, namely that TQM works solely in administrative departments and weakens the academic culture that is supposed to be in place in higher education institutes. Contrary to this, McCulloch (1993) considers that TQM encourages teamwork in committees through innovation and incremental change. According to Schargel (1996), using TQM improves the quality of graduates in higher education, and this reduces the cost that organizations need to train and educate their workers that can cost billions of dollars.

In addition, Aly and Akpovi (2001) support the use of TQM in universities and argue that a lack of leadership and resources that encourage continuous improvement cause TQM to fail in academic departments. Focusing on leadership, some research of Aly and Akpovi (2001) and Kluse (2009), Sirvanci (2004) argues that unlike CEOs in business organizations presidents and chancellors of higher education institutes have less authority in their positions, and this holds them back from taking decisions to change the environment of their organizations into a TQM culture in both their administrative and academic departments. Training is part of TQM but McCulloch (1993) argues that training for faculty should be substituted by self-development. Milakovich's (2006) arguments are similar to Michael, Sower and Motwani (1997) and consider that empowering people is essential for a successful TQM, where people who own their processes and form them based on what they believe is true perform at a very high level and benefit the whole organization.

In this section all of the TQM concepts that are collected in the above two sections constituting the TQM characteristics discussed by the TQM founders and the TQM characteristics developed by the TQM awards' criteria are analysed from the perspective of the higher education TQM scholars in order to present the applicability or inapplicability of those concepts or characteristics to higher education. Table 3 presents TQM scholars' opinion about the implementation of each of the TQM concepts and characteristics and differentiates between the defenders and the opponents of TQM in higher education.

Table 3. TQM in higher education

	A	B	C
1	TQM concepts (TQM founders)	TQM characteristics (TQM founders/TQM awards input)	Literature defending TQM in higher education Literature denying TQM in higher education



2	Processes	<ul style="list-style-type: none"> <li>-plan processes</li> <li>-design processes</li> <li>-conformance to design</li> <li>-analyze processes</li> <li>-control processes</li> <li>-process documentation</li> <li>-improve processes flow</li> <li>-continuous improvement of processes</li> </ul>	<ul style="list-style-type: none"> <li>-improves lab experiments/project reports/presentations</li> <li>-improves administrative tasks like students' enrolment</li> </ul>	<ul style="list-style-type: none"> <li>-standardization limits professors' innovation</li> <li>-cannot be implemented in academic departments</li> <li>-does not improve what students learn</li> <li>-different approaches in teaching for optimal learning</li> </ul>
3	Results	<ul style="list-style-type: none"> <li>-find variation</li> <li>-measure products</li> <li>-qualitycontrol</li> <li>-defect prevention</li> <li>-social responsibility</li> <li>-sustained and outstanding results</li> <li>-meet short and long term needs of stakeholders</li> <li>-results analysis</li> <li>-business results</li> <li>-clear measurement</li> </ul>	<ul style="list-style-type: none"> <li>-improves effectiveness/flexibility/competitiveness</li> <li>-successful results require teamwork/leadership/continuous improvement</li> <li>-TQM gives a result of well skilled force for industry</li> </ul>	
4	Customers	<ul style="list-style-type: none"> <li>-check customers requirements</li> <li>-customers satisfaction</li> <li>-add value to customers</li> <li>-understand customers</li> <li>-customers focus</li> <li>-market focus</li> </ul>	<ul style="list-style-type: none"> <li>-employers are the customers</li> <li>-students are the customers</li> <li>-businesses/industry are the customers</li> <li>-community is the customer</li> </ul>	<ul style="list-style-type: none"> <li>-students are not customers but stakeholders</li> <li>-the student is an active participant not a customer</li> </ul>
5	Assessment	<ul style="list-style-type: none"> <li>-assess</li> </ul>	<ul style="list-style-type: none"> <li>-assessing the programs</li> </ul>	<ul style="list-style-type: none"> <li>-self assessment for</li> </ul>

		<ul style="list-style-type: none"> <li>processes</li> <li>-measure results</li> <li>-evaluate performance</li> <li>-identify problems</li> <li>-conformance to requirements</li> <li>-statistical analysis</li> <li>-organizational performance</li> <li>-data and information analysis</li> </ul>	<ul style="list-style-type: none"> <li>-assessing quality, efficiency, and accountability to generate human resources to the society</li> </ul>	<ul style="list-style-type: none"> <li>faculty</li> <li>-continuous assessment for faculty is very hard</li> <li>-assessment for faculty diminishes innovation and creativity</li> </ul>
6	Reporting	<ul style="list-style-type: none"> <li>-report to decision makers</li> <li>-report data and information</li> </ul>		<ul style="list-style-type: none"> <li>-TQM requires a lot of reporting</li> <li>-It asks about a lot of details</li> <li>-It takes time to collect statistical data</li> <li>-Data might not be useful after a short period of time</li> </ul>
7	Continuous improvement	<ul style="list-style-type: none"> <li>-for processes</li> <li>-for results</li> <li>-self improvements</li> <li>-simple improvements</li> <li>-improve employee quality awareness</li> </ul>	<ul style="list-style-type: none"> <li>-requires teamwork</li> </ul>	
8	Planning	<ul style="list-style-type: none"> <li>-monitoring</li> <li>-match performance&amp; goals</li> <li>-connection between policies and execution</li> <li>-policy and planning</li> </ul>		<ul style="list-style-type: none"> <li>-faculty focus on research more than teaching</li> </ul>
9	Quality goals	<ul style="list-style-type: none"> <li>-use appropriate tools to solve problems</li> <li>-quality is free</li> </ul>	<ul style="list-style-type: none"> <li>-improves both administrative and academic departments</li> <li>-quality function deployment balances between teaching and research</li> </ul>	<ul style="list-style-type: none"> <li>-old traditions hinder TQM</li> <li>-faculty interest hinder TQM</li> </ul>

		-organizations succeed through people's talent -knowledge management -quality of process, product, and service		-lack of team spirit hinders TQM -preventing change hinders TQM culture
10	Strategic Management	-strategic planning -strategic objectives, mission, vision -leaders shape the future and make it happen -agility in responding to threats and opportunities -policy and planning -strategic business plan -align strategic business plan with the organization's processes -prioritization	-TQM helps in designing a mission -TQM leads to gradual improvements -TQM creates intrinsic motivation for students	
11	Communication	-quality improvement teams communicate solutions to problems -information and analysis	-faculty resistance to TQM creates a huge gap between employers' requirements and academic institutions	TQM was not socially authorized since it requires more committee work and less individual benefits for faculty as scholars -TQM lead to less academic freedom for faculty
12	Teamwork	-quality improvement teams -consensus decision making	-TQM encourages teamwork in committees through innovative and incremental change	-team spirit is hard to achieve since departments compete for university resources -committees try to hinder work more than getting it done -no teamwork in academic departments -teamwork weakens academic departments

13	Cost	-reduce cost -increase value -resource management	-TQM reduces cost -it reduces training cost for human resources in industry	
14	Product	-conformance to standard -meet customer's requirements -continuous improvement -focus on products and services -product reliability -reduce product rejection and scrap	-graduates are the product -human resources for industry is the product	-practice knowledge is the product -communication skills is the product -the student is an active participant not a product
15	Leadership	-training -motivation -resources -value of employees -pride -self improvement -improvement -change management -encourage innovation and creativity -leaders: role model for ethics and value -recognition -governance	-leadership is essential for successful TQM -TQM enhances leadership through empowering faculty members	-presidents and chancellors in higher education has less authority than CEOs in businesses which hinders TQM -training should be substituted by self development

## 5. Conclusion and Implications on Future Research

This paper presents a qualitative meta-analysis in which the findings of the higher education literature are integrated interpretively using an analytic process that establishes transparently, comprehensively, and systematically the state of knowledge in the field of quality management. The first section of the meta-analysis results presents the TQM concepts analysed from the founders of the TQM literature. This is to give a clear presentation of the TQM characteristics and concepts that were studied in subsequent sections in terms of their applicability to the higher education context. In addition to this, the meta-analysis section presents the input of TQM awards-offered in Europe, America, Australia, and the UAE to quality management principles and characteristics. Those quality awards are based on the TQM founders' theories but they were analytically

reviewed in order to add any of their developed concepts to the Quality Management characteristics and concepts for the sake of having a result of a comprehensive package of TQM characteristics. In the third section of the meta-analysis all of the TQM concepts that were collected in the previous two sections were analysed from the perspective of the higher education TQM scholars in order to present the applicability or inapplicability of those concepts or characteristics to higher education.

Many researchers argue that the total quality management model should be modified in order to fit the higher education context. However, there is no quality management model that is truly modified to take into account the nature of higher education and the need for professional autonomy including academic freedom and peer review. This paper encourages future research to fill in this gap in the literature and designs a new TQM model for higher education based on the findings of the above meta-analysis and supported by an empirical study using inductive thinking. However, depending on the interpretations and collected data irrelevant TQM concepts will be modified using the traditional university management models in an attempt to resolve the paradox and tension between TQM and those traditional models. This model of TQM shouldn't damage the scholarly values of higher education, but should enhance professional autonomy, including academic freedom and academic quality in teaching and research.

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