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A framework for implementing TQM in higher education programs

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Abstract

Purpose – This paper aims to provide a TQM framework that stresses continuous improvements in teaching as a plausible means of TQM implementation in higher education programs.

Design/methodology/approach – The literature survey of the TQM philosophies and the comparative analysis of TQM adoption in industry versus higher education provide the theoretical and practical background for this work. The analysis of TQM in higher education was done considering various critical factors such as existing educational practices, the barriers of TQM and the return on investment (ROI) of TQM implementations. These explorations led to the development of a TQM framework that adopts Deming's wheel of Plan-Do-Check-Act (PDCA) cycle for implementing continuous improvements in higher education programs.

Findings – Unlike the scenario in industry, TQM philosophies have to be adapted suitably for a successful implementation in higher education. The proposed TQM framework with six core quality elements encompassing the seven-step course evaluation process flow provides a systematic guideline for an effective and efficient implementation of TQM in higher education.

Originality/value – This paper fulfils the need for a systematic, feasible and cost-effective TQM framework for higher education. The new seven-step course evaluation process flow offers a practical guidance for academics to implement TQM in higher education programs.

Keywords Quality, Higher education, Total quality management

Paper type Research paper

Introduction

This work proposes a TQM framework and explores continuous improvements in teaching as a means of implementing TQM in higher education programs.

Over the past few decades, industries have come to understand that in order to stay competitive globally, a self-assessment to continuously improve organisational performance is required (Crosby, 1979; Deming, 1986; Neves and Nakhai, 1993 and Mele and Colucio, 2006). In this context, Total Quality Management (TQM) has been accepted as a disciplined management process in industry in order to cope with the changes in marketplace and to focus on quality in both their products as well as their services. Though TQM has its roots established predominantly in industry, there has been a strong push for adopting TQM in educational organisations (Owlia and Aspinwall, 1998; Moreland and Clark, 1998; Srikanthan and Dalrymple, 2004 and Telford and Masson, 2005). Many researchers (Brigham, 1993; Susan, 1995; Koch and Fisher, 1998; Bath *et al.*, 2004 and Peat *et al.*, 2005) feel that the principles of TQM can definitely contribute to the improvement of higher education, in particular towards curriculum reform.

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While many organisations have been quite successful in TQM implementation, there are quite a number who have failed to reap the benefits of TQM due to their different focus in its implementation (Brigham, 1993). While applying TQM philosophy to their organisations, some managers think that quality is driven by internal productivity programs or participative management programs which may deviate from their core business and customer focus resulting in cost overruns. Hence, it is important for higher education to learn from the experiences of these organisations and to initially concentrate on their core business processes, namely teaching and learning (O'Neill and Palmer, 2004 and Temponi, 2005). Unlike industry, where statistical quality control techniques could be adopted as they deal with tangible processes (such as measuring the quality of the goods / services based on the product specifications), in higher education what happens in the classroom is intangible. This results in higher education having to face with the main challenge of dealing with the intangibility of education. Therefore, the philosophies of TQM need to be adapted to accommodate the intangible aspects of student learning. Currently, higher education is faced with major criticisms from its stakeholders with respect to coping with the ever-changing market situations, socio-economic conditions and stiff competition worldwide. Higher education could cope with such a dynamic situation by continuously improving their processes and by providing high quality education (Lozier and Teeter, 1996 and O'Neill and Palmer, 2004). This paper examines the question – can the philosophies of TQM be integrated with the teaching/learning processes to bring about the necessary improvements in higher education? This work proposes a TQM framework and explores continuous improvement in teaching as a means of implementing TQM successfully in higher education programs.

Quality has various meanings attached and the focus varies from one educational setting to another. Among the various elements of TQM, customer focus, process orientation and continuous improvements are the most common philosophies that have direct implications for teaching and learning in higher education. The next part of this section gives an overview of the various definitions of quality and how different researchers view TQM as a management philosophy for quality improvement.

The origins of TQM and its influence in higher education worldwide are discussed in section 2. It also gives the major similarities and differences between industry and education in the context of implementing TQM. This would help academia to understand the major barriers of TQM in the context of higher education. From industry experience, it is understood that TQM implementation warrants a huge amount of time, effort and money. Since educational processes are quite different from those of industry, especially with a long lead time of at least three years to see its effects in the graduating students of higher education, careful planning is required for a successful cost-effective TQM implementation. Certainly, the government, the public, and the business community would be concerned about the return they receive on their investments in education (Groennings, 1994). In this section return on investment (ROI) of TQM in higher education is considered.

In section 3, a framework for TQM is proposed with six core quality elements that could be adopted by higher educational institutions. Among the three main philosophies of TQM, namely, customer focus, continuous improvement and process-orientation, continuous improvement in teaching and learning has been considered as the backbone for the implementation of the proposed TQM framework.

Wright (1996) states that colleges and universities should try to build up their quality in a certain area of importance that promotes their well-being. Hence, this work considers the core process of education, namely teaching and describes how a seven-step course evaluation process flow of the proposed TQM framework could be used as a feedback loop for achieving continuous improvements in higher education programs.

Section 4 provides a summary of the findings and the conclusions arrived at in this work.

What is quality?

There are various well-known definitions of quality. Crosby (1979) defines quality as "conformance to requirement" while Juran and Gryna (1980) define quality as "fitness for use". Deming's (1986) definition of quality as "a predictable degree of uniformity and dependability at low cost and suited to the market" is more towards quality in operation. Many organisations found that the old definition of quality, "the degree of conformance to a standard", was too narrow and consequently have started to use a new definition of quality in terms of "customer focus". It is reported that many companies had initially concentrated all their efforts on improving internal processes with little or no regard for the relationships between those processes and the organization's ultimate customers (Brigham, 1993). This failure to include the customer focus had resulted in companies struggling hard to survive and resorting to fire-fighting situations. In the context of higher education, due to the intangible nature of their processes, there is considerable discussion on the notions of educational quality (Green, 1994 and Harvey, 1995a). Fincher (1994) describes how quality perspectives have evolved in higher education over the years by going through a shift from experience to technique to style and finally to process.

Harvey and Green (1993) in their seminal work point out that quality is a relative concept. Instead of having a single definition of quality, Harvey and Green provide five discrete but interrelated notions of quality. Quality has a variety of meanings and its range of meanings does cause confusion as each individual's perception of quality differs (Shields, 1999). A possible reason for the dynamic nature of quality is that it is a dynamic idea and the emotional and moral force which quality possesses makes it difficult to be tied down to one particular meaning (Sallis, 1993). Sallis gives a customer definition of quality as that which best satisfies and exceeds customer needs and wants. Thus the definition of quality can be more apt if it is defined based on the customers needs in the context of its application.

Definition of TQM

There are a number of researchers who have formulated frameworks for quality improvements (Johnson, 1993 and Susan, 1995). These frameworks have been given different names such as Continuous Quality Improvement (CQI), Strategic Quality Management (SQM) or Total Quality Management (TQM). Even though there might be some differences among these approaches, the term TQM is considered to be more general to capture the essence of quality improvements.

There are many definitions of TQM. Roosevelt (1995) defines TQM as a strategic architecture requiring evaluation and refinement of continuous improvement practices

in all areas of business. Corrigan (1995) gives a definition with an emphasis on customer satisfaction:

> TQM is a management philosophy that builds a customer-driven, learning organisation dedicated to total customer satisfaction through continuous improvement in the effectiveness and efficiency of the organisation and its processes. (Corrigan, 1995 pp. 61)

Neves and Nakhai (1993) describe the basic tenets of TQM as follows:

> Some of the basic tenets of TQM are long-term perspective, customer focus, top management commitment, systems thinking, providing training and tools in quality, increased employee participation, development of a measurement and reporting system, improved communication between management and labor, and continuous improvement. (Neves and Nakhai, 1993, pp. 122)

It can be seen from the above definitions that TQM describes two main notions - continuous improvement and the tools and techniques/methods used. In general, TQM encompasses many management and business philosophies and its focus gets shifted based on the scenario where TQM is applied. Whether it is in industry or higher education, TQM philosophy revolves around the customer.

TQM in higher education

In the 1970s and 1980s, many American firms experienced economic difficulties and found themselves becoming less competitive with a variety of competitors (most visibly, automobile and consumer electronics producers) from Japan. Undeniably, many firms had lost the international competitive edge they had enjoyed in the 1950s and the inevitable result was declining market shares, sustained losses, unemployment, and massive soul-searching by firms. Driven by such forces as increasing global competition and the struggle to survive, increasing costs, demands for accountability and rising customer expectations about quality, a number of US corporations such as Intel, Hewlett Packard, Xerox, IBM, Motorola, etc. undertook quality initiatives (Lozier and Teeter, 1996 and Lawrence and Robert, 1997). Koch and Fisher (1998) report that many of the American firms turned for advice to Deming, Juran and other disciples of the "quality movement". A similar situation is being faced by the higher education world more recently due to rapidly changing technology, increasing costs, accountability by accrediting associations, legislatures, funding agencies and the public (Fincher, 1994, Green, 1994, Johnston, 1996, Lozier and Teeter, 1996, Shields, 1999). There is also a growing international competition with regard to student enrolments, faculty expertise and research achievements. Johnston (1996) argues how these get addressed when there is quality in teaching.

Owlia and Aspinwall (1996), in their survey, have reiterated that economic and legislative forces are pushing higher education into a new environment and in such an environment, adopting TQM is a "natural" phenomenon. In higher education, TQM is considered as a process-oriented approach to increasing productivity, decreasing costs and improving quality of service (Johnson, 1993; Fincher, 1994; Green, 1994 and Moreland and Clark, 1998). From the theories of TQM, one can conclude that it stresses teamwork, finding better ways to do things, sharing responsibility and dramatically improving institutional cultures, all of which fall well in line with the value set of many modern universities and their faculties.

Lozier and Teeter (1996) report that there are over 300 colleges and universities in US that are actively pursuing total quality principles and tools in some facet of their academic and/or administrative processes. Oakland (1991), in his article, describes the work of the European Centre for TQM at the University of Bradford's Management Centre and its worldwide study of TQM implementation strategies. The activities at the Total Quality Management Centre are devoted to solving real problems and providing practical methodologies to improve quality throughout all the functional areas of the participating organisations. This TQM Centre along with the European Foundation for Quality Management aims to study culture changes and how best to transform organisations into total quality, market-driven, high-performance ones. Their work also includes the development of process capability indices and the measurement of TQM programmes. Madsen and Carlsson (1995) report that TQM is practiced far more in educational institutions in the US than in Europe.

Adopting TQM is being witnessed worldwide with different cultures viewing the TQM philosophy differently (Desjardins and Obara, 1993; Green, 1994; Shields, 1999; Srikanthan and Dalrymple, 2003 and Osseo-Asare *et al.*, 2005). Motwani (1995) cites that educational institutions have started to feel the pressure to change and reform. Furthermore, there is a belief that academic institutions that are slow to embrace TQM, at best, miss the opportunity to lead change and, at worst, run the risk of becoming less relevant to the business world. The momentum of TQM has been so contagious that it started with its roots in manufacturing, branching off into service and healthcare and now penetrates to government and education.

Similarities and differences between industry and education

In industry, it is customary to inspect the finished product. What is the finished product of education? Is it right to say, the graduating students form the finished product of education? Students are non-standard human beings who are embodied with a range of experiences, emotions and characteristics and hence treating them as products misses the complexities of the learning process as a unique learner. However, many researchers have compared industry with education and have pointed out that although industry and education differ from business process perspectives, some of their outcomes such as focussing on building flexibility and improving customer base in a dynamic environment are very much similar (Stensaasen, 1995; Lundquist, 1998 and Srikanthan and Dalrymple, 2003). From the work of Juran and Gryna (1980), Stensaasen states that educational institutions may be considered as industries which provide education as the service with raw materials as incoming students on whom the processes of teaching are applied and turned out as the finished products of graduates. While discussing on the stakeholders' perspectives of quality in higher education, Srikanthan and Dalrymple consider courseware as products, the current and prospective students as users of products and the graduates as output with employers as their users.

Beaver (1994) considers students as customers and raises concern on using student grade distribution to assess quality in analogy with statistical control methods used in industry. He also feels that students are more than customers purchasing a product since students' learning has various contributing factors beyond the classroom, such as social and family background. In the context of adopting TQM in higher education, Lawrence and Robert (1997) have warned that many US firms abandoned TQM in the

face of the recession of the early 1990s since they did not believe the advantages outweighed the costs. Further, Kohn (1993) has strongly expressed that to talk about learning in terms of buying and selling not only reflects a warped view of the activity but contributes to the warping as well. In response to Kohn (1993), Schmoker and Wilson (1993) have stressed that by wisely adapting TQM in the context of education, it can provide an excellent opportunity to succeed where other efforts have failed. As against Kohn's comments, they mention Total Quality's basis in sound psychology, its demonstrated benefits to both schools and industry and its self-refining mechanisms. Lundquist (1998) states that there are some striking similarities between industry and higher education – the customer focus, process orientation and continuous improvement philosophies of TQM adopted in industry is very much applicable in education.

Quality of education is becoming important in the world of competitive environment. There is definitely a need to adopt change in the educational processes in order to improve and stay healthy in the business of education. Realistically, in higher education, TQM appears to be a systematic and a streamlined philosophy for quality management and management of change (Hammersley and Pinnington, 1999). At the same time, the substantial differences between educational and commercial organisations need careful considerations (Srikanthan and Dalrymple, 2003). In such a complex system as higher education, the diverse needs of customers and the process of satisfying them could be a major issue. It is, therefore, important to understand the bottlenecks/barriers present in education systems so as to successfully adapt TQM philosophies to higher education.

Barriers to TQM in higher education

According to many experts, TQM remains a minimum global requirement for staying in business as dictated by changes in society and market (Brigham, 1993). Yet, findings from TQM-related literature conclude that in many cases, TQM has failed to produce its promised results (Koch and Fisher, 1998 and Brigham, 1993). Brigham emphasizes that the surveys do not conclude that the TQM philosophy is worthless rather suggests that the implementation of TQM has been deficient or erroneous. He states that the common mistakes made in implementing TQM in industry are lack of leadership, middle management muddle, misunderstanding of participation, obsession with process and failure to include the customer. He concludes that in higher education, TQM's long-term success depends on the lessons drawn from industry.

Many researchers from higher educational institutions are still sceptical about adopting TQM in education (Kohn, 1993 and Beaver, 1994). Kohn has pointed out that before higher education jumps into another corporate bandwagon such as TQM, one should differentiate between education and business. He has expressed his concerns in the usage of metaphors by researchers while comparing education with industry. He emphasizes that in higher education, achieving high grades as a measure of success in implementing TQM is a major misunderstanding of the principles of TQM. Therefore, the first major barrier for the application of TQM in education is the misinterpretation of TQM philosophy and the lack of understanding the processes that are different in education as compared to industry. This could be due to lack of the necessary knowledge about TQM.

A common barrier to both industry and education in implementing TQM is *lack of proper leadership* (Brigham, 1993). Leaders should be able to set viable corporate vision and be willing to initiate change and provide the resources needed for team efforts directed towards achieving the vision. Senior management may want the results, which TQM can bring but may not be backing it wholeheartedly. TQM should be embraced as a strategy by the top management and they should get visibly and explicitly committed to its philosophy.

The pivotal role played by middle managers in spearheading the impetus for quality improvement may not be understood clearly. There could be another barrier, the fear whether TQM really works and is worth the effort (Sebastianell and Tamini, 1998). Due to this notion, middle managers may not let employees take responsibility. In higher education, there is a need to re-define collegialism in ways of engaging and empowering academic staff with regard to implementing quality policies (Harvey, 1995b). On the other hand, even if the employees are guided by a TQM plan, the middle managers may be too impatient to see the worth of the efforts put in. This is more evident in a higher education scenario than industry due to the complexity of the academic processes involved which might take time for the TQM results to be witnessed by the management.

Another barrier could be employees' resistance to change. In the case of higher education, most of the employees are predominantly professionals who by tradition expect autonomy and academic freedom. Academic staff may not like being asked to rethink their teaching styles (Blankstein, 1996). Educational professionals may be more devoted to teaching than to TQM. Further, it is a common belief that TQM adds unnecessary layers of bureaucracy (Sebastianell and Tamini, 1998) which is not a preferred domain amongst academic professionals. Hence, it may not be possible for them to adopt TQM principles in a short span of time.

In higher education, poor curriculum design could lead to quality failure. There could be unsuitable academic systems and procedures that serve as a bottleneck while imposing changes in curriculum or course delivery (Kohn, 1993). Kohn feels that much of TQM implementation in education fails to address the fundamental questions about learning and more specifically whether the curriculum is engaging in the relevant learning processes. Further, with TQM, there could be too much of documentation of processes, which consumes time and effort.

Another barrier for TQM in education could be lack of sufficient funds and resources. TQM involves a paradigm shift in the mindset of the entire organisation. This can be achieved through systematic and strategic training of all the employees. The educational organisation may not have the required expertise to train the staff and may look for external consultants for training, especially to suit the requirements of education. Hence, TQM involves high cost, effort and time (Koch and Fisher, 1998). Since educational institutions predominantly receive funds from the government, TQM may lead to overshooting of costs. With such immense financial and resource considerations, TQM may not yield the expected benefits within a specific time frame.

In industry, it is easy to measure, monitor and improve product characteristics as compared to the situation in higher education. In higher education, service quality deals with people, the time of delivery, intangibility (learning process is subtle to be measured) and difficulty in measuring successful output and productivity in a quality audit (Harvey, 1995b; Yorke, 1997 and Owlia and Aspinwall, 1998). It is definitely not

easy to measure academic processes due to the involvement of numerous intangible factors. Hence, suitable models need to be adapted to measure quality in higher education.

ROI of TQM in higher education

The TQM initiative, which penetrated electronic and automobile manufacturing in the early 1980s, is now spreading to healthcare, banking and other service-oriented organisations including education. Ishikawa (1990) indicates the importance of training and states that quality control truly begins and ends with educating the organisation about TQM. Hence, to spread the excitement about TQM, millions of dollars have been spent on training the principles of TQM and its implementation. In the name of TQM, many companies have thus incurred huge expenditure and have not realised the ROI that they originally expected. These companies have indulged in huge amounts of expenditure with no added value. Brigham (1993), in his work, has conveyed how higher education can learn from the mistakes committed by industry in TQM implementation. He admits that many universities worldwide have begun implementing TQM under administrative leadership and have shied away from their core processes of classroom and curriculum issues. He addresses what lesson higher education can learn from industry and how educational settings need to rethink the place of quality management in its core academic functions.

Lawrence and Robert (1997) have evaluated TQM applied to academic functions based on two primary dimensions of quality for colleges and universities, such as, commitment to teaching and faculty scholarship, which are directly related to the core processes in higher education. They have concluded that TQM is inappropriate for higher education in the light of their assumption that TQM leads to reduction of variability in the teaching process. They feel that it is difficult to have a customer focus in higher education, as it is not possible to strictly identify the appropriate customer for academic institutions. Some practitioners in industry and academics in higher education have become confused and have even come to doubt the worth and efficacy of TQM. They have failed to realise that TQM is a fundamentally better way to defeat competition and stay healthy in the changing scenario of educational business worldwide. In this context, an achievable positive ROI of TQM could also be a motivating factor for its implementation. Some work on measuring ROI of TQM pertaining to industry and training could be adapted to higher education settings (Usilaner, 1993; Gillis and Bailey, 2003). This is possible by first identifying who our customers are and what benefits we envisage through TQM.

Many observers (Owlia and Aspinwall, 1998 and Lawrence and Robert, 1997) have indicated that there are different customer focuses in higher education. It is, therefore, essential to identify who is the customer of higher education. Customers, more appropriately referred as stakeholders in education, may be of two types – internal and external. It might be more appropriate to state that the students undergoing the study are the primary external customers of higher education, while employers and parents are the secondary external customers, and the others such as, government, alumni, labour market are the tertiary external customers. The internal customers are none other than the teaching staff themselves. Having identified the customers of higher education, we can now state that the main objective of TQM in higher education is to achieve the ROI of customer satisfaction using continuous improvement strategy.

A review of reports on TQM experiences in universities and higher education institutions indicate that most of continuous improvements incorporated are related to the administrative tasks (Owlia and Aspinwall, 1998 and Reid and Ashelby, 2002), which could result in a very low ROI. In order to bring in positive influences of TQM with a high ROI, it is essential to incorporate continuous improvements that are measurable in the core education process, namely, teaching.

Implementing TQM in higher education – a framework

Many researchers (Lawrence and Robert, 1997; Fitz-Gibbon, 1997 and Blankstein, 1996) who have argued that TQM will not work for higher education, have given a focus on teacher performance and not on the process of student learning. On the contrary, continuous improvement in teaching actually shifts the emphasis from teacher performance to the processes involved in student learning. It stresses developing and improving teaching in a way that encourages active learning, responsibility and commitment in students. This caters to the ROI of customer satisfaction with regard to primary customers directly and to secondary and tertiary customers indirectly. Since the learning process is addressed here, TQM will influence life-long learning characteristics among the learners, which in turn would satisfy secondary and tertiary customers such as parents, employers and government as well.

TQM in higher education requires establishing a strong feedback loop with evaluation being a continuous process and not just left until the end of the program of study. This work presents a framework that adopts TQM principles such that its underlying effects reach the core processes in higher education, namely, teaching and student learning.

TQM framework

In this competitive world, higher education institutions face the challenge of providing quality education under tight budgetary constraints. Hence, they have started to believe in preparing the students for a future of dynamic change, with relevant knowledge and life-long skills. In this context, the principles of TQM fit well as they instil a thirst for continuous improvement, such as, self-improvement, work improvement and improving community and society. The first step towards implementing TQM in a higher education setting should be to adopt a relevant TQM framework that meets its mission and objectives.

The TQM framework should be built upon a set of core values and concepts. These values and concepts provide the foundation for integrating the key performance requirements within the quality framework. A set of fundamental core values forming the building blocks of the proposed TQM framework is listed as follows:

- leadership and quality culture;
- continuous improvement and innovation in educational processes;
- employee participation and development;
- fast response and management of information;
- customer-driven quality; and
- partnership development, internally and externally.

With these six core values as the backbone of quality elements, a TQM framework for the higher education setting is proposed as depicted in Figure 1.

Quality circles, a management technique borrowed from Japanese industry is now being considered in higher education settings (Romero *et al.*, 1995 and Freed *et al.*, 2000). A quality circle consists of a small group of people that meet on a regular basis, to discuss problems, seek solutions, and cooperate with management in the implementation of those solutions (Juran and Gryna, 1980 and Ishikawa, 1990). Quality circles utilise organised approaches to problem solving and operate on the principle that employee participation in decision-making and problem solving improves the quality of work. In higher education, quality circles monitor and identify the areas that affect the quality of teaching. The quality circles should be directly involved with the six core elements of a TQM framework as in Figure 1. Some higher education institutions form a "Quality Assurance Department" or a "Educational Quality Department" or "TQM Department", which is group of people striving to achieve educational quality. In this paper, a more historic term "Quality Circles" (QC) is used to denote such a group of people.

The roles of the six core elements of a TQM framework are described below:

(1) *Leadership:* The past few decades have seen much work on educational leadership (Bensimon and Neumann, 1993, Westerman, 1994, Kezar, 1998 and Friedman, 2004). The leadership element should examine senior management's personal leadership and involvement in creating and sustaining a customer focus, clear goals, high expectations and a leadership system that would promote performance excellence. It should also examine leadership system and policies internally that would impact staff and students and public responsibilities, establishing partnerships with industry, parents, and general community externally. Improvements in leadership effectiveness could be achieved through a participative management style that includes inputs from a comprehensive 360-degree feedback system from these internal and external stakeholders. The strategic planning of this element would examine how the

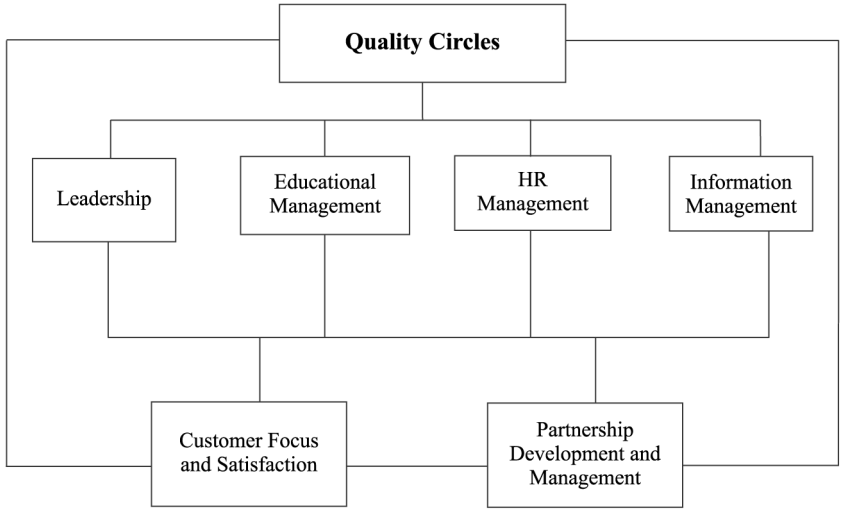

Figure 1.
TQM framework in higher education

institution sets strategic directions and how it determines key plan requirements with a primary focus on customer satisfaction.

(2) *Educational management:* This element should examine the key aspects of process management, including learner-focused education design, education delivery, services and business operations. It should examine how key processes are innovatively designed, effectively managed and continuously improved. The performance results of this element would examine student performance and improvement using key measures and indicators.

(3) *Human resource management:* This element should examine how staff development and training are aligned with the institution's objectives. It would also examine the efforts to build and maintain a climate conducive to achieving performance excellence, full participation and organisational growth. Some of the strategic thrusts of this element would be on manpower development such as staff recruitment, training and career development, staff performance and recognition and quality work environment.

(4) *Information management:* The information management element should examine the management and effectiveness of the use of data and information to support overall mission-related performance excellence. It should ensure reliability and accessibility of the necessary key information required for day-to-day operational management. It would also focus on making analysis of facts and information and respond to situations in a fast and effective manner.

(5) *Customer focus and satisfaction:* This element should examine how the institute determines the needs and expectations of students and stakeholders. It would include determining different performance measures and how the targets could be achieved. Some of the performance measures could be based on student satisfaction surveys, student forums and dialogue sessions, industry needs and satisfaction surveys and evaluation of teaching and learning effectiveness.

(6) *Partnership development and management:* This element should examine how partnerships at various levels, internal and external could be established. Effective leadership, good education management, efficient human resource management and versatile information management would definitely help in managing dynamic relationships with internal and external stakeholders.

Implementing this proposed TQM framework involves complex and inter-related educational business processes. This would encompass various dimensions of quality (Lagrosen *et al.*, 2004), including corporate collaboration, information responsiveness, teaching and non-teaching facilities/resources available, teaching and evaluation practices and the type of courses offered. But it is important to observe that all six core values and elements of the proposed TQM framework have an obvious customer focus with an emphasis on customer satisfaction and continuous improvement. In realising these six core values and elements, the next step is to identify the core educational business process, namely teaching and student learning, that provides the main vehicle for achieving customer satisfaction and quality improvements. Hence, it is important to focus on the TQM issues related to teaching and how continuous improvement provides the necessary foundation for quality in higher education.

Implementing TQM in classrooms

Implementing TQM in classrooms addresses the quality of the core business processes of higher education. Beaver (1994) states that there are various criteria for classroom teaching and these predominantly include the following with regard to teaching excellence:

- active learning to enhance student involvement;
- mastery of content and the ability to communicate it;
- assessment and other means of feedback about student learning; and
- concern for students' learning and progress.

According to Prabhu and Ramarapu (1994), in many colleges and universities, teaching evaluations have been used to measure the quality of instruction in the classrooms. Today, higher education institutions aim at equipping the students with life-long skills like communication and thinking skills and promote independent learning and creativity. The activities for the courses are planned in such a way so as to accommodate these aims and objectives. To what extent they have been accomplished is determined through course and program evaluation. Gronlund and Linn (1990) view evaluation as answering the question "How good?" which acts as a feedback mechanism for incorporating continuous improvement in the teaching/learning processes.

In higher education, program evaluations conducted once in 3 to 4 years are expected to give a macro perspective of the strengths and weaknesses of the entire program as a whole. This is complemented by a micro examination of the curriculum and the student learning process through individual course evaluations, which is usually conducted every year for course review. Normally, after the courses pertaining to a program are evaluated for a student cohort, the program evaluation follows as the next step. Program evaluation should include course evaluation inputs, as well as a survey from employers of their graduates, alumni, external examiners, etc.

Course evaluation process

Assessing the quality of teaching is a complex process as it involves many intangible factors. Ledic *et al.* (1999), in their work, have adopted survey questionnaires as the method for assessing the quality of teaching. They have conducted a survey on teachers and students based on 15 criteria and concluded that the results of the assessment differ substantially between teachers' view and students' view of quality with regard to "ideal" form of teaching and "real" form of teaching. Hence, course evaluation should be considered as a feedback mechanism and the course evaluation process should help in reducing the gap between what the teachers/lecturers perceive as the ideal form of teaching/learning and what the students perceive as the real or actual form of teaching/learning.

As part of implementing the proposed TQM framework, this paper describes a systematic method/process flow that could be adopted for course evaluation by the QC of any institution of higher education. The typical activities involved in a course evaluation process are given in Figure 2.

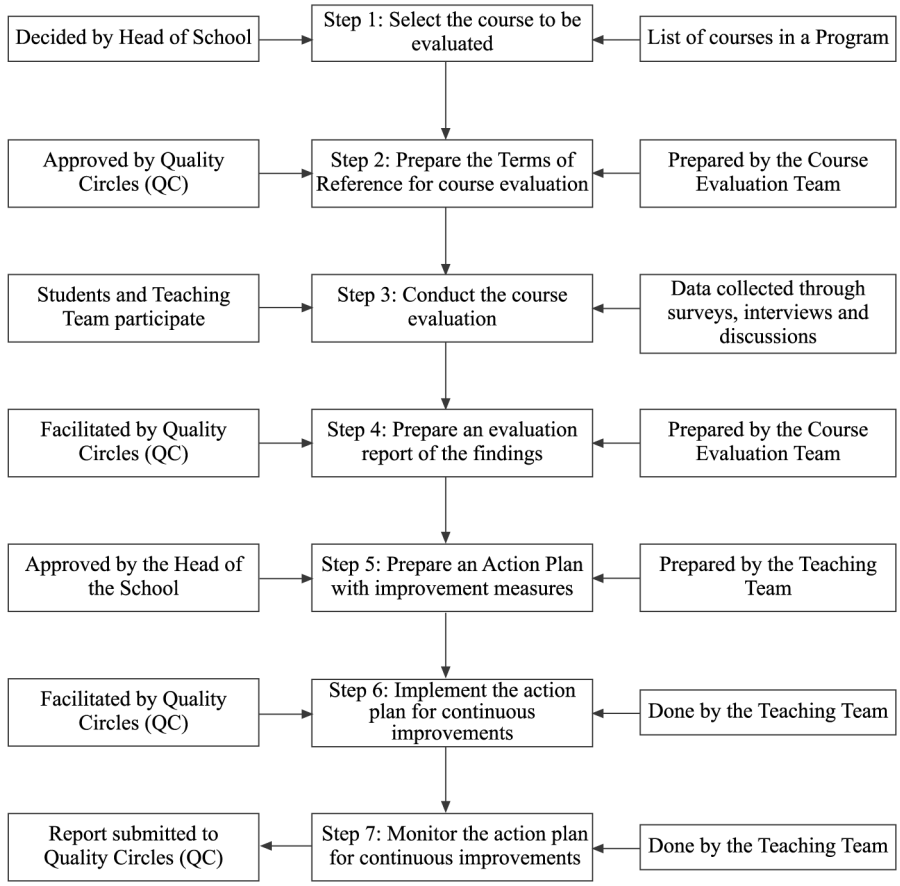

Figure 2.
Course evaluation process flow

Step 1: Select the course to be evaluated

In any higher education program, after the curriculum had been designed and courses are delivered, the first step in the evaluation process is to identify the set of key courses that affect the graduate profile of the students. Such core courses required to undergo quality evaluations are normally determined by the head of the school. Some of these courses could be ear-marked for undergoing quality check at the end of every run of the course. On the other hand, some other courses go through this evaluation process once in two or three years only. These are normally determined by the head of the school.

Step 2: Prepare the terms of reference for course evaluation

For each course, a *Teaching Team* consists of the course leader/ coordinator, the lecturers and the tutors who are directly involved in teaching the course. At the time of course evaluation, a *Course Evaluation Team* should be formed with members consisting of the course coordinator, at least one other lecturer (who may not be teaching the course but versatile in the course topics) and an external lecturer (teaching a different program even). It would be ideal to have one member of the quality circle to

be a part of the Course Evaluation Team or at least brief the team about the course evaluation process flow (Figure 2). The QC would normally pre-define a standard set of Terms of Reference (TR). Some of the typical terms of reference pre-defined for course evaluations are given below:

- course aims and objectives;
- the overall breadth and depth of the syllabus;
- topic sequencing;
- horizontal and vertical integration in relation to other courses in the course;
- relevance in relation to the needs of industry and students' vocational needs;
- how current the course is in relation to technological developments and practices in industry;
- course documentation;
- the potential for developing creative thinking/critical reasoning/practical problem-solving and promoting life-long learning;
- opportunities for independent study or self-directed learning;
- relevance and effectiveness of instructional materials and instructional methods / process;
- appropriateness and effectiveness of assessment methods;
- student performance (in terms of knowledge gains, thinking process, skills acquired);
- student learning attitudes, motivation, approaches and difficulties;
- resources (library resources, space, equipment, staff expertise, etc.); and
- overall effectiveness in achieving the aims/objectives set out for the program, course and the graduate profile.

The teaching team, in consultation with the course evaluation team, determines a set of TR from this pre-defined list. Based on the nature of the course, only those TR that play a major role in the continuous improvement of the course are selected as the basis for course evaluation.

Step 3: Conduct the course evaluation

Course evaluation should involve both students as well as the members constituting the Teaching Team. Regardless of how much quality a lecturer exhibits, there is no guarantee that the students' learning will take place if the motivation and efforts from the students are lacking. Such gaps can be identified when both students as well as Teaching Team are involved in the course evaluation process. One common method used for course evaluation is to conduct a survey with a well-defined questionnaire. From the TR given in the above list, the questionnaires for course evaluation could be designed based on the emphasis given for each TR in meeting the specific needs of the course. The questions in the questionnaires could be framed under four major categories:

(1) design of the course;

(2) instructional effectiveness;

(3) assessment and evaluation; and
(4) course materials/resources.

The student questionnaire is normally administered to all the students undergoing the course and the academic staff questionnaire is administered to the members of the Teaching Team. Feedback from students and staff could be collected through not only questionnaires but also through interviews and discussion/focus groups to uncover some points that require further investigation and clarification. All the necessary data is then collected and analysed by the Teaching Team.

Step 4: Prepare an evaluation report of the findings
From the data analysed in Step 3, it would be possible to identify the major strengths and good practices of the course. At the same time, it would be possible to identify at least one major area for improvement and some peripheral areas of concern, which are to be addressed for further action. The Course Evaluation Team prepares a Course Evaluation Report that summarises these main findings and proposes recommendations in consultation with the Teaching Team. The QC department of the institution would oversee that the course evaluation process is carried out according to the procedures and the scheduled plan. However, the quality of the recommendations depends to a large extent on the degree to which the Course Evaluation Team and Teaching Team have examined and probed the issues as set out in their TR. The report also provides all the information necessary for action plan and follow-up (given in Steps 5 and 6 below).

Step 5: Prepare an action plan with improvement measures
Based on the findings and the recommendations, the Teaching Team is required to identify areas of improvement. Generally, the Teaching Team is required to focus on two or three significant areas of improvement/concerns and prepare an action plan for the recommendations made. This is done bearing in mind factors such as:

- its importance in relation to the course's overall aims and objectives;
- the course emphases related to the desired graduate profile;
- its impact on the quality of learning in the course; and
- new areas of concern from industry, government and education bodies.

The action plan would include the basis for determining the areas of improvement and the follow-up action proposed by the Teaching Team. The resources needed and the target dates for implementing the specified actions are also indicated in the action plan. The desired outcomes are the intended improvements that are expected to arise from the follow-up procedure (given in Step 6). These outcomes are required to be observable and measurable with realistic time frames for completion (O'Neill and Palmer, 2004 and Marzo-Navarro *et al.*, 2005). Measurements would normally include tangible aspects (for, e.g. improvement in student marks, improved lecturer productivity such as reduced time in assessment marking) and non-tangible aspects (for, e.g. improved student/lecturer satisfaction) pertaining to teaching and student learning. Once this proposed follow-up action is approved by the Head of the school, the action plan would

form the main output of the course evaluation process. A sample template for the follow-up action plan is given in Figure 3.

Step 6: Implement the action plan for continuous improvements

To achieve the intended improvements, a successful implementation of the Action Plan is necessary. The follow-up report is completed subsequently by the next teaching team of the course. They would record the outcome of the action plan after its implementation.

The follow-up procedure consists of the following steps executed in a cycle:

(1) *Follow the action plan:* The Teaching Team takes the proposed recommendations given in the action plan as inputs while planning for the next delivery of the course. The team would then fine-tune the actions that are feasible and plan the activities accordingly.

(2) *Collect data for the desired outcomes:* The Teaching Team plans as to how the relevant data for achieving the outcomes would be gathered. For practical reasons, much of the data are gathered as part of the team's on-going effort in monitoring the course. Such data includes assignment or assessment results, feedback elicited during lessons, discussion sessions and simple survey findings. The Teaching Team is also required to specify a few indicators for measuring the desired outcomes. Such indicators are more feasible if the data available/gathered is quantitative in nature. Some examples of such indicators could be:

- percentage of students who indicated that the course helped them to develop problem-solving skills; and
- percentage of passes for an assignment which tests students' competencies in problem solving.

(3) Merits in having such indicators are that they are useful in helping the Teaching Team focus on the kind of data that would be useful for analysis. Another merit is that the indicators, if well chosen, would enable them to ascertain whether improvements have been made in the area/s identified in more concrete terms.

(4) *Analyse the data:* To determine whether the desired improvements have been made, there is a need to analyse and interpret the data, and arrive at conclusions that are supported by evidence.

(5) *Project the results:* This last step will round off one whole cycle of the follow-up procedure. The course team prepares a brief write-up including any relevant materials (e.g. samples of the original and revised worksheets, questionnaires, a

Major Areas for Improvement	Proposed Actions to be Taken	Resources Required	Target Date of Implementation	Desired Outcomes (Improvement Measures)

Figure 3.
Follow-up action plan template

summary of findings, student performance results and feedback gathered) that would provide useful information on the actions taken and the outcomes achieved. The follow-up report together with the relevant attachments is submitted to the QC department by the end of the specified time frame. The next cycle of course evaluation process starts from this point.

Step 7: Monitor the action plan for continuous improvements

The complete Course Evaluation Report submitted to the QC department forms the basis for the Teaching Team along with QC to monitor their progress. Periodic monitoring is necessary to ascertain that the committed actions are completed within the target dates. The status or details of progress are maintained in the report by the QC after the necessary actions have been implemented. This way the course undergoes a continuous improvement process according to Deming's wheel of Plan-Do-Check-Act (PDCA) cycle.

A rigorous course evaluation process with appropriate follow-up actions will definitely pave way towards continuous improvements in teaching / learning and this will ultimately lead to a better customer satisfaction. Thus, the course evaluation process flow, described above, encompasses the main philosophies of TQM such as customer focus, continuous improvement and process orientation of the core functions of higher education, namely teaching and learning. Since course evaluation becomes part and parcel of the teaching process, there are no major additional costs involved in implementing this TQM framework.

Conclusions

TQM philosophies have been realised in education nearly three decades later than the industry sector. There has been much criticism among researchers in borrowing TQM ideas from industry to education. At the same time many researchers do arrive at similarities between education and industry and have drawn conclusions towards favourable implications of TQM in higher education. However, not all TQM implementations are successful.

In this work, the TQM background from industry is studied and the barriers of TQM implementation in higher education are addressed. The similarities and differences between industry and education have been analysed. Since TQM implementation involves much effort and time, the ROI of TQM in higher education is given careful consideration. In this regard, continuous improvement in core processes, namely teaching/learning is considered as the quality foundation for TQM implementation in higher education with a feasible ROI. The philosophies of TQM need to be adapted to accommodate for the intangible aspects of teaching and learning that forms the core functions of higher education. Such a tailor-made approach could lead to successful implementation of TQM in higher education.

A TQM framework with six core quality elements (Figure 1) is proposed and its implementation guideline is provided through a seven-step course evaluation process flow (Figure 2) that is suitable for higher education settings. A highly coupled feedback loop of the process flow typically consists of a survey, results analysis and projection, action plan with improvement measurements and the follow-up procedure. Such a course evaluation process flow would help the teaching team to achieve continuous improvements in their course delivery and the student learning processes involved.

This is in line with one of the successful approaches of TQM, namely, Deming's wheel of PDCA cycle.

This work concludes that successful implementation of TQM in higher education could be achieved by adopting a TQM framework as proposed here, which prioritises continuous improvements in the core processes, namely teaching/learning. This will enable higher education institutions to:

- be aware of the ever-changing customer needs and react immediately to their needs;
- efficiently utilise the resources by directing their usage on activities that truly satisfy customer needs;
- use the course evaluation's feedback loop for making improvements in a systematic and continuous way; and
- engage both learners as well as the institution members in their quality mission.

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Glossary of acronyms

CQI	Continuous Quality Improvement
PDCA	Plan-Do-Check-Act
QC	Quality Circles
ROI	Return On Investment
SQM	Strategic Quality Management
TQM	Total Quality Management
TR	Terms of Reference

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