

Quality Assurance for Higher Education in Lebanon
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Guide I: Introduction to Quality Management in Higher Education

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I. Understanding Quality

A. Definition

Whatever type of organization you work in – a university, a college, a hospital, a bank, local government, an airline, a factory – competition is rife: competition for students, for patients, for customers, for resources, for funds... Any organization basically competes on its reputation – for quality, reliability, price and delivery – and most people now recognize that quality is the most important of these competitive weapons. Moreover, this sort of attention to quality improves performance in reliability, delivery, and price.

For any higher education institution, there are several aspects of reputation which are important:

- It is built upon the competitive elements of quality, reliability, delivery, history and price, of which quality has become strategically the most important.
- Once a higher education institution acquires a poor reputation for quality, it takes a very long time to change it.
- Higher education reputations, good or bad, can quickly become national reputations.
- The management of the competitive weapons, such as quality, can be learned like any other skill, and used to turn round a poor reputation, in time.

Before anyone will buy the idea that quality is an important consideration, they would have to know what is meant by it.

Quality is often used to signify “excellence” of a product or service – people talk about “Harvard top quality”. In some manufacturing companies the word may be used to indicate that a piece of material or equipment conforms to certain physical dimensional characteristics often set down in the form of a particularly tight specification. If we are to define quality in a way that is useful in its *management*, then we must recognize the need to include in the assessment of quality the true requirements of the “customer” – the needs and expectations.

Quality is then simply *meeting the customer requirements*, and this has been expressed in many ways by several sources:

- “Fitness for purpose or use” – Juran, an early doyen of quality management.
- “The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs” – BS 4778: 1987 (ISO 8402, 1986) *Quality Vocabulary: Part 1, International Terms*.
- “The totality of features and characteristics of a product or service that bears on its ability to satisfy given needs.” – The American National Standards Institute (ANSI) and the American Society for Quality (ASQ) quality terminology 1978.
- “Quality should be aimed at the needs of the consumer, present and future” – Deming, another early doyen of quality management.

- “The total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product and service in use will meet the expectation by the customer” – Feigenbaum, the first man to write a book with “Total Quality’ in the title.
- “Conformance to requirements” – Crosby, an American consultant famous in the 1980s.
- “Degree to which a set of inherent characteristics fulfils requirements” – ISO (EN) 9000 : 2000 *Quality Management Systems – fundamentals and vocabulary*.

The usefulness of these definitions in higher education depends on the proper identification of who are the “clients” for higher education institutions. Unlike many manufacturers and other service industries, higher education institutions have more than one client. In fact, they have two primary clients – parents/guardians and students. They also have secondary clients – future employers of their current students (with employers, higher education institutions want to increase the possibility that they will employ their graduates).

In essence, students can be viewed as performing multiple roles. They are both the clients and the products of the higher education institution. This is a situation unique to higher education. This dual role does not make the application of quality impossible, it simply requires the acceptance that the dual role of students as clients and products does not prohibit the concept’s application.

B. The History of Quality

1. The Age of Craftsmanship: During the Middle Ages in Europe, the skilled craftsperson served both as manufacturer and inspector. “Manufacturers” who dealt directly with the customer took considerable pride in workmanship. Craft guilds, consisting of masters, journeymen, and apprentices, emerged to ensure that craftspeople were adequately trained. Quality assurance was informal; every effort was made to ensure that quality was built into the final product by the people who produced it. These themes, which were lost with the advent of the Industrial Revolution, are important foundations of modern quality assurance efforts.
2. The Early Twentieth Century: In the early 1900s the work of Frederick W. Taylor, often called the ‘father of scientific management’ led to a new philosophy of production. Taylor’s philosophy was to separate the planning function from the execution function. By segmenting a job into specific work tasks and focusing on increasing efficiency, quality assurance fell into the hands of inspectors. Plants employed hundreds, even thousands, of inspectors. Inspection was thus the primary means of quality control during the first half of the twentieth century.
3. Post-World War II: During this time, two US consultants, Dr. Joseph Juran and Dr. W. Edwards Deming, introduced statistical quality control techniques to the Japanese to aid them in their rebuilding efforts. A significant part of their educational activity was focused on upper management, rather than quality specialists alone. With the support of top managers, the Japanese integrated quality throughout their organizations and developed a culture of continuous improvement (sometimes

referred to by the Japanese term *Kaizen*). Improvements in Japanese quality were slow and steady; some 20 years passed before the quality of Japanese products exceeded that of American and European manufacturers.

4. From the late 1980s and through the 1990s: Interest in quality grew at an unprecedented rate. It was a period of remarkable change and growing awareness of quality by consumers, industries, and governments worldwide. By 1990, quality drove nearly every organization's quest for success and quality practices expanded into the service sector especially the higher education institutions and health care providers worldwide. By the mid 1990s thousands of professional books had been written, and quality-related consulting and training had blossomed into an industry. New quality awards were established.
5. From Product Quality to Performance Excellence: Although quality initiatives focused initially on reducing defects and errors in products and services through the use of measurement, statistics, and other problem-solving tools, organizations began to recognize that lasting improvement could not be accomplished without significant attention to the quality of the management practices used on a daily basis. Managers began to realize that the approaches they use to listen to customers and develop long-term relationships, develop strategy, measure performance and analyze data, reward and train employees, design and deliver products and services, and act as leaders in their organizations are the true enablers of quality, customer satisfaction, and business results. Many began to use the term **Big Q** to contrast the difference between managing for quality in all organizational processes as opposed to focusing solely on manufacturing quality (**Little Q**). As organizations began to integrate quality principles into their management systems, the notion of **total quality management, or TQM**, became popular. Quality took on a new meaning of organization-wide performance excellence rather than a narrow engineering – or production-based technical discipline and permeated every aspect of running an organization.

The real challenge today is to ensure that managers do not lose sight of the basic principles on which quality management and performance excellence are based. The global marketplace and domestic and international competition have made organizations around the world realize that their survival depends on high quality. Tom Engibous, president and chief executive officer of Texas Instruments, commented on the present and future importance of quality in 1997: "Quality will have to be everywhere, integrated into all aspects of a winning organization".

It should be known that the quality process is challenging; true quality requires persistence, discipline, and steadfast leadership committed to excellence.

II. Quality philosophies and Frameworks

A. Introduction

The concept of “pride and joy” in work – and its impact on quality- is one of the foundations of the philosophy of W. Edwards Deming. Deming, along with Joseph M. Juran and Philip B. Crosby, are regarded as true ‘management gurus’ in the quality revolution. Their insights on measuring, managing, and improving quality have had profound impacts on entire institutions around the world. This section presents the quality management philosophies of these three gurus, their similarities and differences, and also examines their individual contributions to modern practice. In addition, it discusses the contributions of other key individuals who have helped to shape current thinking in quality management. These philosophies became the cornerstone for quality management practice and frameworks, such as the Deming Prize, the Malcolm Baldrige National Quality Award, the European Quality Award, the ISO 9000 standards which form the basis for much of the remainder of this guide.

B. The Deming Philosophy

No individual has had more influence on quality management than Dr. W. Edwards Deming (1900-1993). Deming received a Ph.D. in physics and was trained as a statistician, so much of his philosophy can be traced to these roots. Despite numerous efforts, his attempts to convey the message of quality to upper-level managers in the US were ignored. Shortly after World War II Deming was invited to Japan and began to teach Japanese managers statistical quality control. Deming’s influence on Japanese industry was so great that the Union of Japanese Scientists and Engineers established the Deming Application Prize in 1951 to recognize companies that show a high level of achievement in quality practices. Unlike other management gurus and consultants, Deming never defined or described quality precisely. In Deming’s view, variation is the chief culprit of poor quality. He claimed that higher quality leads to higher productivity, which in turn leads to long-term competitive strength. Deming stresses that top management must assume the overriding responsibility for quality improvement. Although Deming’s philosophy underwent many changes as he himself continued to learn, it was based on his “14 Points”:

1. **Constancy of purpose:** An organization must define its values, mission, and vision of the future to provide long-term direction for its management and employees. Deming believed that institutions must take a long-term view, invest in innovation, training, and research, and take responsibility for providing jobs and improving a firm’s competitive position. This responsibility lies with top management, who must show commitment.
2. **Adopt a new philosophy:** Deming sought to change the prevailing attitudes that ignored the importance of quality improvement. He believed that companies cannot survive if products of poor conformance quality or poor fitness for use leave their customers dissatisfied. Instead, companies must take a customer-driven approach based on mutual cooperation between labor and management and a never ending cycle of improvement. To effectively focus on the customers’ needs, everyone in the institution must learn the principles of quality and performance excellence.

3. Cease mass inspection: Deming encouraged workers to take responsibility for their work, rather than leave the problems for someone else down the production line. Simple statistical tools can be used to help control processes and eliminate mass inspection as the principal activity in quality control. Inspection should be used as an information-gathering tool for improvement, not as a means for assuring quality or blaming employees.
4. End Price tag business: Deming recognized that the direct costs associated with poor quality as well as the loss of customer goodwill can far exceed the cost savings perceived by purchasing. Deming also urged businesses to establish long-term relationships with fewer suppliers, leading to loyalty and opportunities for mutual improvement.
5. Improve constantly and forever: Improvements are necessary in both design and operations. When quality improves and costs decrease, as the Deming chain reaction suggests.
6. Institute training: Not only does training result in improvements in quality and productivity, but it adds to worker morale, and demonstrates to workers that the company is dedicated to helping them and investing in their future.
7. Institute leadership: Deming recognized that one of the biggest impediments to improvement was a lack of leadership. The job of management is leadership, not supervision. Supervision is simply overseeing and directing work; leadership means providing guidance to help employees do their jobs better with less effort.
8. Drive out fear: Driving out fear underlies many of Deming's 14 points. Fear is manifested in many ways : fear of reprisal, fear of failure, fear of the unknown, fear of relinquishing control, and fear of change. No system can work without the mutual respect of managers and workers. Workers are often afraid to report quality problems because they might not meet their quotas, their incentive pay might be reduced, or they might be blamed for problems in the system. Creating a culture without fear will definitely add value to organizations.
9. Break down departmental barriers: Teamwork helps to break down barriers between departments and individuals. The lack of cooperation leads to poor quality because other departments cannot understand what their internal customers want and do not get what they need from their internal suppliers.
10. Eliminate slogans, targets, and exhortations: Statistical thinking and training, not slogans, are the best routes to improving quality. Motivation can be better achieved from trust and leadership than from slogans.
11. Eliminate numerical quotas and management by objective (MBO): Deming believed that standards and quotas are born of short-term perspectives and create fear. They do not encourage improvement, particularly if rewards or performance appraisals are tied to meeting quotas. Workers may short-cut quality to reach the goal. Deming acknowledged that goals are useful, but numerical goals set for others without incorporating a method to reach the goal generate frustration and resentment.
12. Remove barriers to worker pride: Deming believed that one of the biggest barriers to pride in workmanship is performance appraisal. Performance appraisal destroys teamwork by promoting competition for limited resources, fosters mediocrity because objectives typically are driven by numbers and what the boss wants rather than by quality.

13. Institute education and self-improvement: The difference between this point and point 6 is subtle. Point 6 refers to training in specific job skills; point 13 refers to continuing, broad education for self-development. Organizations must invest in their people at all levels to ensure success in the long term.
14. Putting everyone to work, to realize the transformation: Any cultural change begins with top management and includes everyone. Changing an organizational culture generally meets with skepticism and resistance that many firms find difficult to deal with, particularly when many of the traditional management practices Deming felt must be eliminated are deeply ingrained in the organization's culture.

As we noted earlier, Deming did not propose specific methods for implementation because he wanted people to study his ideas and derive their own approaches. As he often stated, "There is no instant pudding".

C. The Deming Philosophy Applied to Higher Education

In the discussion that follows, we will examine how each of the above 14 points applies to higher education:

1. Constancy of purpose: The difficulties that higher education institutions would have in implementing constancy of purpose as defined by Deming are twofold. First, there are difficulties in defining and sticking to a purpose, and secondly, there are difficulties in maintaining the institutional stability necessary to achieve constancy of purpose. However, both of these obstacles can be overcome. At first glance, it would appear that the higher education institution's purpose is clear-educate students. Certainly that is clear, as a generalization. But in the complex modern world, that definition is too simplistic to be of value. For a higher education institution to know that it is producing the right product and services, it must answer the question "what is an educated graduate for the present and the future? Will the emphasis be on academic skills or social skills? Standards or work? So the first part of constancy of purpose for higher education institutions will be to determine their purpose. To answer this, higher education institutions will have to spend time on the future. This means long-range thinking and planning. It means working with visioning and mission development. It means having faith in the future to the point of daring to project into the future and making commitments to that projection. Higher education institutions have experience with all of those concepts. The problem is that they have not been accompanied by long-term commitment. This is evidenced by the constant vulnerability of higher education institutions to educational trends and fads, which come and go and leave little evidence of their existence behind them. This is because innovation, which should be a complimentary word or description, has come to mean change for the sake of change. If we consider innovation using Deming's definition, innovation would be thought of as a constant commitment to the quality of the products and services that make up the purpose of the higher education institution. Deming's emphasis on research could easily be used as well in higher education institutions. The institutional structure would need to reflect the importance of this function. Basically, to achieve constancy of purpose, higher education institutions will only need to spend more time thinking about the future. The obstacles to this are the tendencies of higher education institutions presidents to change jobs every three to

five years. Couple this with the fact that board members constantly turn over, and the problem becomes evident. Here is what must happen to overcome this problem. First ethically, higher education institutions presidents and board members must be willing to think beyond their tenures. There should be other safeguards beyond ethics to insure the continuity necessary for constancy of purpose. First, policy developments should include the planning and decision making that have occurred relative to constancy of purpose. Second, boards and presidents, the least stable elements of the higher education community, should involve the most stable members in the development and implementation of long-term planning. These stable members are employers, business and community leaders and faculty. By doing this, a higher education institution could have the stability necessary to maintain a constancy of purpose.

2. Adopt a new philosophy: We are in a new higher education age. Higher education institutions administration must awaken to the challenge, learn their responsibilities, and take on leadership for change. Quality must become the new religion in higher education. We can no longer afford poor workmanship in students, using bad learning materials, fearful and uninformed faculty, poor faculty training, and administrative job hopping. If we are rid the higher education institutions of these practices, it will require a transformation of management philosophy. It is hard to change after a lifelong career of doing things the same way. But in this new era of higher education competitiveness, higher education institutions must to change to stay in existence. Higher education institutions must also begin to work toward long-term improvement. They must begin listening more to constituents who, in the end, will determine the meaning of quality for their institutions. Higher education institutions will need to strive for the one thing that will, over the long run, please their constituents, and therefore make them more competitive-that is, a quality focus based on monitoring, controlling, and improvement.
3. Cease mass inspection: Cease dependence on supervision to achieve quality education. The aim of finding the bad faculty members and administrators and throwing them out is too late, too ineffective, and too costly to students and the institution through remediation efforts required to undo the damage. Quality comes not from supervision but from the improvement of the process. The old way of supervising bad quality out must be replaced by the new way of building good quality in.
4. End price tag business: End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost. Induce publishers and other vendors to be actively involved with the institution through long-term commitments. In fact, price has no meaning without a measure of the quality being purchased.
5. Improve constantly: Improvement is not a one-time effort. Everyone and every department must subscribe to the ethic of constant improvement, and management must lead the way. Putting out fires is not improvement of quality. The pursuit of continuous improvement mandates that innovation become a stable part of the system, and more importantly, that innovation become a part of strategic planning. Higher education institutions must continually innovate so that the best educational processes will be discovered.

6. Institute training: Higher education refers to this process as professional development. Good training programs will concentrate on raising knowledge about real problems, followed by immediate application. The higher education institution must know which faculty/staff are competent in both knowledge and skill application, and utilize these competent faculty/staff as mentors for new faculty/staff.
7. Institute leadership: The aim of leadership should be to help faculty and students to do a better job. Quality leadership will be required to implement continuous improvement in the educational program. New relationships between administrators and faculty and faculty and students must be created and maintained. Administrator roles will be to help faculty and students do the best job possible, foreseeing and eliminating barriers that prevent faculty and students from doing quality work.
8. Drive out fear: fear and anxiety are present at all levels of most higher education institutions. These feelings result from management's efforts to spur better performance from faculty and staff with the use of numerical goals, ranking, incentives, and slogans intended to stimulate the competitive spirit. The response to this fear and anxiety is defensiveness. By ridding higher education institutions of these old-style management techniques, the fear will be greatly reduced.
9. Break down departmental barriers: For higher education institutions, this point should include elimination of the barriers between buildings as well as departments. The educational infrastructure in most higher education institutions includes multiple buildings. Therefore, the existence of barriers between and among buildings is an acute problem. The departmental barriers are most prevalent in higher education institutions. Faculty in various departments tend to think within the confines of their own disciplines.
10. Eliminate slogans, targets, and exhortations: Eliminate slogans calling for pride or new levels of faculty/staff effort. Such exhortations only create adversary relationships, as most of the causes of low quality and low productivity belong to the system and thus lie beyond the power of faculty and the other workforce personnel. Slogans only generate frustration and resentment. They are based on the supposition that employees could, if they tried do better. Faculty/Staff perceive slogans and exhortations as signals that management not only does not understand their problems, but it does not care enough to find out about them. It is totally impossible for anyone or any group to perform outside a stable system, either above or below it. Total Quality Management will create a stable system, and eliminate the need for slogans and other exhortations that fall on deaf ears.
11. Eliminate numerical quotas: The setting of goals and evaluating both goals and people by quantifiable output are contradictory to the total quality management concepts of identifying stable systems and then working with continuous improvement. For example, faculty members may focus on getting as many as possible to achieve the quota. They will tend to disregard, or give less emphasis to, the students who are either already above the quota or have little chance of achieving the quota. This practice means that the average students will receive the most resources, time, and energy, while the extremes away from the average are left to swim or sink on their own. What is lost in this process is the pursuit of quality and the intrinsic desire to continuously improve.

12. Remove barriers to worker pride: Remove barriers that rob faculty/staff of their right to pride of workmanship. This means abolishment of the annual or merit rating scheme and the management by objective. Listen to the faculty/staff, and have clear expectations over time. Give them ongoing feedback on work, institute and maintain training/retraining, and do not evaluate critically without suggestions. Make effectiveness, not efficiency, the goal of administration.
13. Institute education/self-improvement: It is not enough to have good people in your institution. Faculty/staff must be continually acquiring new knowledge and skills. This program of education must fit people into ever-changing jobs and responsibilities. How will higher education institution employees believe that their institution is constantly improving unless they can see that they themselves are constantly improving? Higher education is a service industry, operated not by machines but by people. No improvement in technology or infrastructure is more important than improvement in the people who make up the institution.
14. Putting everyone to work, to realize the transformation: Put everybody in the higher education institution system to work to accomplish the transformation to total quality. The transformation is everybody's job. The transformation process will take team management and initiative from top management. However, every employee will be involved in quality. The most frequent cause of failure in any quality improvement effort is the lack of involvement or a sense of indifference on the part of top and middle management. Therefore, the active leadership and participation of administrators, beginning at the top, is essential.

With an eye to the long term, and with commitment to the management philosophy on the part of everyone involved, total quality management can be implemented in higher education institutions, providing the same successes for higher education that it provided for industry.

D. The Juran Philosophy

Joseph Juran was born in Romania in 1904 and came to the United States in 1912. He spent much of his time as a corporate industrial engineer, and in 1951, did most of the writing, editing, and publishing of the *Quality Control Handbook*. This book, one of the most comprehensive manuals ever written, has been revised several times and continues to be a popular reference. Juran's definition of quality suggests that it should be viewed from both external and internal perspectives; that is quality is related to 1. Product performance that results in customer satisfaction and 2. Freedom from product deficiencies, which avoids customer dissatisfaction. Juran's prescriptions focus on three major quality processes, called the **Quality Trilogy**:

1. Quality planning – the process of preparing to meet quality goals;
2. Quality control – the process of meeting quality goals during operations;
3. Quality improvement – the process of breaking through the unprecedented levels of performance.

As a parallel to Deming's emphasis on identifying and reducing sources of variation, Juran stated that quality control involves determining what to control, establishing units of measurement to evaluate data objectively, establishing standards of performance, measuring actual performance, interpreting the difference between actual performance

and the standard, and taking action on the difference. Unlike Deming, however, Juran specified a detailed program for quality improvement. Such a program involves proving the need for improvement, identifying specific projects for improvement, organizing support for the projects, diagnosing the causes, providing remedies for the causes, proving that the remedies are effective under operating conditions, and providing control to maintain improvements. Many aspects of the Juran and Deming philosophies are similar. The focus on top management commitment, the need for improvement, the use of quality control techniques, and the importance of training are fundamental to both philosophies. However, they did not agree on all points. For instance, Juran believed that Deming was wrong to tell management to drive out fear. According to Juran, “fear can bring out the best in people”.

E. The Crosby Philosophy

Philip B. Crosby (1926-2001) was corporate vice president for quality at International Telephone and Telegraph (ITT). After leaving ITT, he established Philip Crosby Associates in 1979 to develop and offer training programs. He also authored several popular books. His first book, *Quality Is Free*, sold about 1 million copies. The essence of Crosby’s quality philosophy is embodied in what he calls the “Absolutes of Quality Management” and the ‘Basic Elements of improvement’. Crosby’s Absolutes of Quality Management include the following points:

- Quality means conformance to requirements: Requirements must be clearly stated so that they cannot be misunderstood. Crosby maintained that once the requirements are specified, quality is judged solely on whether they have been maintained.
- There is no such thing as a quality problem: Problems must be identified by those individuals or departments that cause them. In other words, quality originates in functional departments, not in the quality department, and therefore the burden of responsibility for such problems falls on these functional departments. The quality department should measure conformance, report results, and lead the drive to develop a positive attitude toward quality improvement.
- There is no such thing as the economics of quality; doing the job right the first time is always cheaper: Crosby supports the premise that “economics of quality” has no meaning. Quality is free. What costs money are all actions that involve not doing jobs right the first time.
- The only performance measurement is the cost of quality, which is the expense of nonconformance: Quality cost data are useful to call problems to management’s attention, to select opportunities for corrective action, and to track quality improvement over time. Such data provide visible proof of improvement and recognition of achievement.
- The only performance standard is ‘Zero Defects (ZD)’: Crosby felt that the zero defects concept is widely misunderstood and resisted. It is described as follows: “The theme of ZD is to do it right the first time. That means concentrating on preventing defects rather than just finding and fixing them...Most human error is caused by lack of attention rather than lack of knowledge. Lack of attention is created when we assume that error is inevitable...”

Crosby’s basic elements of improvement were determination, education, and implementation. Determination means that top management must take quality improvement seriously. Everyone should understand the absolutes, which can be

accomplished only through education. Finally, every member of the management team must understand the implementation process. Unlike Juran and Deming, Crosby's approach was primarily behavioral. He emphasized using management and organizational processes rather than statistical techniques to change corporate culture and attitudes.

F. Similarities among Deming, Juran, and Crosby

Despite their significant differences, the philosophies of Deming, Juran, and Crosby are more alike than different. Each views quality as imperative in the future competitiveness in global markets; makes top management commitment an absolute necessity; demonstrates that quality management practices will save, not cost money; stresses the need for continuous, never-ending improvement; acknowledges the importance of the customer and strong management/worker partnerships; and recognizes the need for and difficulties associated with changing the organizational culture. These similarities among the three philosophies constitute the main principles to what is today known as **Total Quality Management (TQM)**.

G. Other Quality Philosophers

1. **A.V. Feigenbaum:** Feigenbaum is best known for coining the phrase **total quality control**, which he defined as "... an effective system for integrating the quality development, quality maintenance, and quality improvement efforts of the various groups in an organization so as to enable production and service at the most economical levels which allow full customer satisfaction." His book *Total Quality Control* was first published in 1951 under the title *Quality Control: Principles, Practices, and Administration*. He viewed quality as a strategic business tool that requires involvement from everyone in the organization, and promoted the use of quality costs as a measurement and evaluation tool. Feigenbaum's philosophy is summarized in his three steps to quality: a-**Quality Leadership:** A continuous management emphasis is grounded on sound planning rather than reaction to failures. Management must maintain a constant focus and lead the quality effort. b- **Modern Quality Technology:** Resolving quality problems requires the integration of office staff as well as engineers and shop-floor workers in the process who continually evaluate and implement new techniques to satisfy customers in the future. c- **Organizational Commitment:** Continuous training and motivation of the entire workforce as well as an integration of quality in business planning indicate the importance of quality and provide the means for including it in all aspects of the firm's activities.
2. **Kaoru Ishikawa:** An early pioneer in the quality revolution in Japan, Ishikawa was the foremost figure in Japanese quality until his death in 1989. Ishikawa built on Feigenbaum's concept of total quality and promoted greater involvement by all employees. Some key elements of his philosophy include: a- quality begins with education and ends with education b- the first step in quality is to know the requirements of customers c-the ideal state of quality control occurs when inspection is no longer necessary d- remove the root cause, not the symptoms e-quality control is the responsibility of all workers and all divisions f-marketing is the entrance and exit of quality...

3. **Genichi Taguchi:** A Japanese engineer whose philosophy was strongly advocated by Deming – explained the economic value of reducing variation. Taguchi maintained that the manufacturing based definition of quality as conformance to specification limits is inherently flawed. Taguchi measured quality as the variation from the target value of a design specification, and then translated that variation into an economic loss function that expresses the cost of variation in monetary terms. Taguchi advocated as well certain techniques of experimental design to identify the most important design variables in order to minimize the effects of uncontrollable factors on product variation.

The philosophies of Deming, Juran, Crosby, and others provide much guidance and wisdom in the form of ‘best practices’ to managers around the world, leading to the development of numerous awards and certifications (including Deming Prize, Malcolm Baldrige, ISO 9000, European Quality Award...) for recognizing effective application of TQM principles. These award and frameworks will be discussed later in this guide within the context of the higher education industry.

III. Quality Management in Higher Education

A. Introduction

While quality and excellence have always been a keen concern for educators in higher education, the debate on how to manage or improve quality has intensified in more recent years.

Terminology can confuse the issue, with the terms quality management, quality assurance, quality improvement, quality control and quality assessment being some of the key terms used to describe all or part of the institutional process of focusing on quality issues. Internationally, different countries have tended to adopt one or more terms more than the others for describing their particular processes.

However, despite the variations of terminology and approaches, international trends in quality improvement and management have tended to converge rather than diverge, particularly when it comes to the principles of what an institution should be like that is effectively engaged in improvement of quality. Even where specific approaches to development of improved quality exist, interchange of best practices continues to help government quality agencies and councils refine their processes and expectations.

In practice quality improvement in a higher education institution is concerned with an ongoing cycle of agreeing on a set of standards and/or goals, gathering relevant information, evaluating feedback and ensuring the implementation of change. A higher education institution involved in a strong and effective quality improvement process will be characterized by the following:

15. An institutional culture that is open to constructive evaluation and to change.
16. A high level of satisfaction from students, employees and external customers.
17. Institution-wide embracing of the concept of quality improvement, including a commitment to participate in institutional improvement and growth.
18. Evidence of ongoing measurable improvement in institutional performance in agreed areas of need.
19. Open communication within and between different areas of operation.
20. Self-confidence of the institution in its ability to manage its own future, and evidence of its success in doing so, particularly in relation to any external accreditation bodies.

B. Quality Management Issues in Higher Education

The following principles provide a framework for development of all quality improvement processes:

- Internal quality management complements external accreditation expectations: External accreditation agencies have traditionally evaluated an institution in relation to a set of standards. However, much more importance is now attached to an institution's ability to manage effectively its own quality. This means that external accreditation bodies want to find mature institutions that can successfully identify their own strengths and areas for needed improvement, and then develop a strategy to bring necessary changes that are evidenced by outcomes. This focus on institutional quality management changes the way that higher education institutions should see external accreditation. It is still an important process, but it is one that helps guide the

internal processes, providing assistance in developing guidelines of accepted standards and monitoring the institution's effectiveness in responding to these.

- Quality management decisions, especially the identification of quality objectives should be linked to the institutional strategic plan: Strategic planning and quality management look at different aspects of the present and future of a higher education institution. However, there are clear areas of overlap and effective coordination between the two will strengthen the higher education institution and avoid unnecessary duplication of effort.
- Quality improvement will be most successful if the higher education institution culture is open to change and improvement: In fact, this is not the automatic culture in a higher education institution, where traditions can be strong and departments can operate with a high degree of independence. Transparency, openness, responsiveness and creativity should form the bases of the ideal culture for quality improvement in higher education institutions.
- A quality management plan of a higher education institution should be comprehensive: An institution-wide quality improvement plan moves beyond the area of academic quality. Its concern is equally with the physical campus, the quality of student life, the attitudes of faculty and staff, the satisfaction levels of faculty and staff, the interaction and the service to external constituencies.
- A quality management plan needs to be supported by accurate factual information: The higher education institution should have a regular process in place to gather factual and quantifiable data about institutional quality. The individuals leading on quality management need to inform the necessary individuals or groups of what information they need on a regular basis, and need to take advice back on what may or may not be possible or objective.
- Quality management procedures should be concerned with both formative and summative evaluation and finding the correct balance of these for institutional quality improvement: Whenever evaluation is involved, there is always a level of summative evaluation involved. This gives a final judgment on a situation. A quality management process that does not draw some end conclusions will be a weak one. A summative conclusion that identifies areas of concern should result in major recommendations for change and improvement. A formative evaluation, on the other hand, is feedback that leads to re-evaluation and change in a situation where immediate changes are possible and may correct identified issues of concern.
- Senior Administration responsibility: Ensuring that a strong quality management plan is both in place and operating effectively is the responsibility of senior administration. Managing the process of quality improvement is the responsibility of all faculty and staff. However, developing structures to ensure quality management happens in an effective and cost-effective way is more complex. The actual structure adopted by an institution will vary, dependent on other institutional structures
- The quality improvement cycle is a continuous process: The quality improvement cycle starts with evaluation of the present, and then sets goals for the future. Plans are implemented and then after a reasonable period of time, the effectiveness of the implementation is evaluated, and appropriate conclusions are drawn and appropriate actions taken. At that point the cycle starts again.

- Avoid excessive formalization in the implementation of the quality improvement process: A strong quality improvement process is vital to an institution, but it can become so formalized and bureaucratic in its implementation that it becomes time-consuming and has very little practical value. However, if the process is effectively coordinated and if the ideals are fully integrated into institutional culture, quality improvement will enhance the institutional experience for all concerned members and parties.

IV. TQM in Higher Education

A. Definition

Simply stated, Total Quality Management (TQM) is an organizational philosophy and a management approach which involves all employees and is aimed at continuously improving the organization's effectiveness in achieving customer satisfaction. The concepts and application of TQM originate from Japan. Since the early 80s, the value of TQM has increasingly been recognized in the US and subsequently in Europe.

While originally limited to the private sector, and more particularly manufacturing enterprises, the early successes of TQM contributed to the spreading of its principles and methods across other sectors, including higher education institutions, public services, and non-profit organizations.

Although some official definitions of TQM exist, it must be recognized that the scope of TQM is not very well defined. Aspects which were central to TQM some decades ago in Japan may have lost their prominent place today. Thus, TQM is more a catalyst for existing trends and tendencies, than a standard or a precise catalogue of methods and prescriptions.

Over the past years some generic models for TQM have been developed. In the USA, the first models were based upon the ideas of some quality gurus like Deming, Juran and Crosby. The more elaborated system which has been developed out of this is the set of criteria for the Malcolm Baldrige Award (discussed later in this guide). This has become the standard reference model for TQM in the United States, with adaptation for specific sectors including higher education.

In Europe, the most important model is that developed for the European Quality Award (discussed later in this guide), promoted by the industry-led European Foundation for Quality Management (EFQM). The EQA model has also been at the basis of the criteria of national quality prizes in many European countries. Adaptations of the EQA model have been made for the education sector including higher education.

B. TQM characteristics

One may identify a TQM organization through four different series of characteristics:

- Underlying concepts.
- Operational principles.
- Implementation characteristics.
- Typical results.

The five underlying concepts of TQM are the following:

1. A clear customer focus: The first priority must be to understand and to satisfy the needs and expectations of the customers and the chosen target group. The customer orientation also embraces the concept of internal customer within an organization.

2. Continuous improvement: An institution-wide attitude should prevail whereby the search for improvement always continues, by everyone in the organization.
3. Quality assurance of internal processes; this implies that standards are set, procedures to achieve them are defined, and adherence to these is guaranteed; problems occurring are remedied in a systematic way.
4. Process orientation: This principle points to the need for process thinking, for an integrated approach to the whole development and delivery chain, and for an optimization of the internal/external interfaces.
5. Prevention instead of inspection to achieve quality: Through adequate preventive measures, fewer quality errors will occur, customers will be more satisfied, and less inspection and control will be needed.

The operational principles are the following:

1. Top management commitment: The driving force behind any TQM approach must be the commitment, vision and exemplary leadership of the senior management.
2. Teamwork: The benefits of TQM reside to a large extent in effective teamwork, particularly when involving people from different departments. Effective, cross-functional teamwork needs to be a key operational characteristic of any TQM effort.
3. Quality is everyone's job: This goal requires the involvement of all employees at all levels and in all departments. It must be supported through human resource strategies that recognize and reward quality efforts.
4. Focus on facts and systematic problem-solving: Discussions and decisions on activities and resource allocations should be based on reliable and relevant information. TQM calls for the use of appropriate tools and methods (discussed later in this guide) for identifying weaknesses and areas for improvement, analyzing them, tracing the sources of problems, seeking improvements and finally, implementing them.

While there are many ways to implement all these principles, research shows that most TQM organizations display the following implementation characteristics:

1. The formulation of a clear vision and mission statements: These are communicated and accepted throughout the institution, and serve as an anchor for the quality policy and strategy.
2. The establishment of a quality manual: which describes the institution, its policies, its key processes and the responsibility and authority of staff. In general, such an overall quality manual is complemented by procedural manuals at department level, describing the critical processes in details. Access to up to date information in quality and procedural manuals is a necessity for quality assurance.
3. Training: Training needs are analyzed and remedied where necessary, in order to ensure that all employees are qualified for the activities they perform. Training should be complemented by human resource policies that reward improvement, professional development and quality achievements.
4. Empowerment: Empowerment of employees increases commitment and motivation and encourages mutual trust and support throughout the organization.

5. Feedback: Customers are asked for feedback all the time, often through regular customer surveys aimed at understanding needs and expectations, checking satisfaction with the quality provided, and detecting new trends. Such surveys are systematically analyzed in order to implement changes where necessary.

Finally, the institution is likely to show the following typical results:

1. Better and more consistent quality of product/service provided.
2. Considerable reduction in problems, complaints, delays...
3. Regular innovations in products/services.
4. Cost effective and efficient processes throughout the institution.
5. A highly motivated, qualified and self-confident workforce.

C. The Rationale behind TQM in Higher Education

One might imagine that the primary reason to embrace TQM concepts by higher education institutions would have been to improve the quality of their education provision. The reality is more complex, however. Based on reported experience and documented case studies, the main rationale behind the TQM approach appears to have been:

- An improved external quality perception and image, thanks to clearer internal policy choices, better customer orientation and more effective internal/external marketing.
- A more efficient internal organization, with more effective management, better motivated staff, and more successful internal communication.
- Achievement of professionalism in non-educational services such as the services and activities provided by the institution in addition to the delivery of courses (registration, administration...)
- Raising the quality of the education through the relevance of the courses, the quality of instruction, the effectiveness of the needs analysis.

D. Challenges/Problems Associated with the Application of TQM in Higher Education

- Higher education is a sector in which individual autonomy and academic freedom are highly valued; therefore, top-down management initiatives may be viewed with deep concern.
- Another problem associated with the implementation of total quality management in higher education is the commercial undertone of the language which is utilized.
- Right first time is detrimental to creativity, experimentation and research which are central to a higher education context.
- In total quality management, the processes are supposed to be customer-driven. In higher education, the critical problem is the identification of the customers to drive towards.
- The main tenet of effective communication required within a university for total quality management implementation is rarely reached.

V. ISO 9000 in Higher Education

A. What is ISO?

The International Organization for Standardization (ISO) is a non-governmental organization established in 1947. The mission of ISO is to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the spheres of intellectual, scientific, technological and economic activity.

ISO's work results in international agreements which are published as International Standards.

B. ISO's name

Many people have noticed a seeming lack of correspondence between the official title when used in full, International Organization for Standardization, and the short form, ISO. Shouldn't the acronym be "IOS"? Yes, if it were an acronym – which it is not.

In fact, ISO is a word, derived from the Greek isos, meaning equal. Whatever the country, the short form of the organization's name is always ISO.

C. ISO 9000

ISO 9000 is a family of standards for quality management systems. ISO 9000 is maintained by ISO. An institution that has been independently audited and certified to be in conformance with ISO 9001 may publicly state that it is "ISO 9001 certified". Certification to ISO 9001 does not guarantee the compliance of end products and services; rather, it certifies that consistent business processes are being applied.

Although the standards originated in manufacturing, they are now employed across a wide range of other types of organizations. A product, in ISO vocabulary, can mean a physical object, or services, or software. In fact, according to ISO in 2004, "service sectors account by far for the highest number of ISO 9001: 2000 certificates – about 31% of the total.

D. History of ISO 9000

- **Pre ISO 9000:** During World War II, there were quality problems in many British high-tech industries such as munitions, where bombs were exploding in factories during assembly. The adopted solution was to require factories to document their manufacturing procedures and to prove by record keeping that the procedures were being followed. In 1979, the authorities in the United Kingdom published a generic standard. The name of the standard was BS 5750, and it was known as a management standard because it did not specify what to manufacture, but how to manage the manufacturing process. The success of this standard was rapidly observed outside the United Kingdom. In 1987, therefore, ISO issued a family of standards, ISO 9000, which were almost a direct copy of the British standard.
- **1987 version:** The 1987 version had the same structure as the UK standard BS 5750 with three models for quality management systems, the selection of which was based on the scope of activities of the organization:

1. ISO 9001:1987 *Model for quality assurance in design, development, production, installation, and servicing* was for companies and organizations whose activities included the creation of new products.
 2. ISO 9002:1987 *Model for quality assurance in production, installation, and servicing* had basically the same coverage as ISO 9001 but without covering the creation of new products.
 3. ISO 9003:1987 *Model for quality assurance in final inspection and test* covered only the final inspection of finished product, with no concern for how the product was produced.
- 1994 version: This version emphasized quality assurance via preventive actions, instead of just checking the final product, and continued to require evidence of compliance with documented procedures. As with the first version, the downside was that companies tended to implement its requirements by creating shelf-loads of procedure manuals, and becoming burdened with an ISO bureaucracy.
 - 2000 version: This version combines ISO 9001, 9002, and 9003 into one, now called 9001. Design and development procedures are required only if a company does in fact engage in the creation of new products. The 2000 version sought to make a radical change in thinking by actually placing the concept of process management front and center. The 2000 version also demands involvement by upper executives, in order to integrate quality into the business system and avoid delegation of quality functions to junior administrators. Another goal is to improve the effectiveness via process performance metrics – numerical measurement of the effectiveness of tasks and activities. Expectations of continual process improvement and tracking customer satisfaction were made explicit. The requirements of this version are organized into four major sections: Management Responsibility; Resource Management; Product Realization; and Measurement, Analysis, and Improvement. ISO 9000:2000 is a response to the widespread dissatisfaction that resulted from the old standards. The 2000 version had a completely new structure, based on the following eight principles - that reflect the basic principles of total quality philosophies discussed above- :
 1. Customer Focus: Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements, and strive to exceed customer expectations.
 2. Leadership: Leaders establish unity of purpose and direction for the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.
 3. Involvement of people: People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit.
 4. Process approach: A desired result is achieved more efficiently when activities and related resources are managed as a process.
 5. System approach to management: Identifying, understanding, and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives.

6. Continual improvement: continual improvement of the organization's overall performance should be a permanent objective of the organization.
 7. Factual approach to decision making: Effective decisions are based on the analysis of data and information.
 8. Mutually beneficial supplier relationships: An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value.
- 2008 Future version: TC 176, the ISO 9001 technical committee, has started its review on the next version of ISO 9001, which will in all likelihood be termed the ISO 9001:2008, assuming its planned release date of 2008 is met. Early reports are that the standard will not be substantially changed from its 2000 version.

E. Certification

ISO does not itself certify organizations. Many countries have formed accreditation bodies to authorize certification bodies, which audit organizations applying for ISO 9001 compliance certification. Both the accreditation bodies and the certification bodies charge fees for their services. The various accreditation bodies have mutual agreements with each other to ensure that certificates issued by one of the accredited certification bodies are accepted worldwide.

The applying organization is assessed based on an extensive sample of its sites, functions, products, services, and processes; a list of problems (action requests or non-compliances) is made known to the management. If there are no major problems on this list, the certification body will issue an ISO 9001 certificate for each geographical site it has visited, once it receives a satisfactory improvement plan from the management showing how any problems will be resolved.

An ISO certificate is not a once and for all award, but must be renewed at regular intervals recommended by the certification body, usually around three years.

F. Auditing

Two types of auditing are required to become registered to the standard: auditing by an external certification body (external audit) and audits by internal staff trained for this process (internal audits). The aim is a continual process of review and assessment, to verify that the system is working as it is supposed to, find out where it can improve and to correct or prevent problems identified. It is considered healthier for internal auditors to audit outside their usual management line, so as to bring a degree of independence to their judgments.

G. The Relation between Quality assurance, ISO 9000 and TQM

The term quality assurance is defined in ISO 8402 – a standard containing official definition of key quality terms – as follows: “All the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that an entity will fulfill requirements for quality.”

In practical terms, quality assurance requires an organization to ensure that:

- Quality standards are defined for all activities to which quality assurance applies.
- Suitable procedures are available for ensuring that quality standards are met.

- Procedures are systematically monitored for conformance, using statistical methods where appropriate.
- Causes of the non-conformances identified are analyzed.
- Causes of problems are eliminated through appropriate corrective action, in order to avoid – or at least minimize – the probability of those problems reoccurring.

When all this is undertaken – in whatever way – for a set of activities, processes, or outputs, it can safely be stated that quality assurance is taking place.

Although quality assurance is only one of the underlying concepts of a TQM approach, it should be recognized that it is closely linked to the other components of TQM. For instance:

- The customer orientation should be reflected in the definition of standards.
- Continuing improvement is only possible when the current system is well known and under control.
- The effective application of quality assurance requires a process orientation.

Thus, effective quality assurance is an important milestone towards a TQM based organization; similarly, implementing TQM without adequate attention to quality assurance concepts will eventually fail.

At first sight, it would appear that the ISO 9000 standards are concerned with quality assurance alone. However, a closer look shows that the standards cover more than quality assurance alone, and pay attention to other aspects of TQM especially in the year 2000 version.

H. Main Reasons for Seeking Certification by Higher Education Institutions

Improving or maintaining the quality of education is not the only reason why higher education institutions seek to be ISO 9001 certified. Overall, four types of arguments are put forward:

1. Promotion of a high quality image, high visibility and credibility: Image is important for all types of higher education institutions, because it influences the numbers of students –and hence in the long term the survival of the organization. The image perceived by the outside world depends on the quality of services delivered, as well as on how effective that quality performance is communicated. Being certified under ISO 9001 is an easily communicated signal to the outside world that the institution is committed to quality and that it has been subject to independent external scrutiny.
2. A response to external factors: The concern for quality and performance is growing in society, with all institutions being expected to become more accountable to all stakeholders. In addition, customers, in higher education increasingly desire proof of the quality promised. Certification is a way of responding to such demands.
3. Develop a full quality assurance system: If a higher education institution is looking for a comprehensive quality assurance approach, then the principles of ISO 9001 are to be considered seriously. The benefits listed for ISO 9001 by certified higher education institutions include: The provision of a visible, understandable and verifiable focus for the internal quality improvement efforts of an organization; the perspective of a certificate is important for the motivation of staff, it considers higher

education activities not as isolated processes, but in the context of the organization's quality objectives.

4. Improvement of specific activities of the organization: Some higher education institutions have sought to introduce ISO 9000 to improve specific functions or activities. This may be related to a general concern of ensuring high customer satisfaction, or the willingness to attain specific quality levels. Some examples include the improvement of the logistical and support processes, quality assurance of the examination and evaluation of students.

I. Challenges/Problems Associated with the Application of ISO 9000 in Higher Education:

- Interpretation problems: The application of ISO 9000 is not straightforward. The requirements and even the underlying concepts have to be translated or interpreted into a language that a higher education institution can understand. Even specialists who have published interpretations or guidelines on ISO 9000 in higher education – do not agree entirely on all interpretation issues.
- Insufficient relevance: Many higher education experts criticize ISO 9000 at its core, as being of insufficient relevance for higher education institutions. They argue that many critical aspects of higher education are not explicitly listed in the standard and may hence not be covered. They also believe that the complexity and multiplicity of objectives and purposes of higher education do not fit very well with the standardization resulting from ISO 9000.
- Time consumption and cost: The cost and time consumption nature of ISO 9000 requirements are probably the most serious obstacle to the generalized use of the standards in higher education institutions.
- Skepticism: ISO 9000 is met with much skepticism in higher education circles, and the standards also face competition with existing or new quality assurance, audit or accreditation arrangements.

J. Critical Success Factors (CSF) for ISO 9000 in Higher Education:

ISO 9000 is not an appropriate goal for any institution in any circumstance. Neither can anyone engage in the certification process with a reasonable chance of success. Below are ten CSF for successful implementation of ISO 9000 by higher education institutions. Most of these are necessary conditions for successful certification:

1. The higher education institution (HEI) should know very well why it wants to be certified.
2. The HEI has fully committed senior staff who are prepared to implement a quality system.
3. The HEI is convinced of the relevance of the standard not only the certificate.
4. The HEI takes all requirements of ISO 9000 seriously.
5. The HEI has a long term vision on quality issues.
6. The HEI has already high quality standards for its key services.
7. The HEI is well organized.
8. The HEI is not in the middle of another major change process such as restructuring.

9. The HEI is capable of committing sufficient staff time.
10. The HEI starts from a sound financial situation.

If a higher education institution fails to meet more than half of these conditions, it is unlikely to benefit quickly from its ISO 9000 journey.

VI. Quality Awards

A. The Deming Prize

The Deming Prize was instituted in 1951 by the Union of Japanese Scientists and Engineers (JUSE) in recognition and appreciation of W. Edwards Deming's achievements in statistical quality control and his friendship with the Japanese people.

The Deming Prize is awarded to all companies that meet a prescribed standard. However, the small number of awards given each year is an indication of the difficulty of achieving the standard. The emphasis of the Deming Prize now is on finding out how effectively the applicant is achieving distinctive performance improvements through the application of companywide quality control (CWQC). As defined by JUSE, CWQC is a system of activities to assure that quality products and services required by customers are economically designed, produced, and supplied while respecting the principle of customer orientation and the overall public well-being.

The Deming Prize "examination viewpoints" now include

1. Top management leadership and organizational vision and strategies.
2. TQM frameworks: Organizational structure and its operations, daily management, relationship to ISO 9000 and ISO 14000, TQM promotion and operation...
3. Quality assurance system: QA system, process control, test, quality evaluation and quality audits...
4. Management systems for business elements: cross-functional management and its operations, quantity/delivery management, environmental management, safety, hygiene and work environment management...
5. Human resources development: positioning of people in management, education and training, respect for people's dignity...
6. Effective utilization of information: positioning of information in management, information systems, support for analysis and decision making...
7. TQM concepts and values: quality, maintenance and improvement, respect for humanity...
8. Scientific methods: understanding and utilization of methods, understanding and utilization of problem-solving methods...
9. Organizational powers: core technology, speed, vitality...
10. Contribution to realization of corporate objectives: customer relations, employee relations, social relations, supplier relations, shareholder relations, realization of corporate mission, continuously securing profits...

B. The Malcolm Baldrige National Quality Award (MBNQA)

Recognizing that US productivity was declining, the Malcolm Baldrige National Quality Improvement Act was signed into law on August 20, 1987 in the USA. The focus of the program was defined as follows :

- Helping to stimulate American companies to improve quality and productivity.
- Recognizing the achievements of those companies that improve the quality of their goods and services.

- Establishing guidelines and criteria that can be used by business, industrial, governmental, and other enterprises in evaluating their own quality improvement efforts.

The award is named after President's Reagan's Secretary of Commerce, who was killed in an accident lately after the Senate acted on the legislation. Up to three companies can now receive an award in each of the original categories of manufacturing, small business, and service (prior to 1999, only two). Congress approved award categories in nonprofit education and health care in 1999.

B.1 MBNQA criteria for performance excellence

The award examination is based upon a rigorous set of criteria, called the criteria for performance excellence that consist of a hierarchical set of categories, items and areas to address. The seven categories are as follows:

1. Leadership: this category examines how an organization's senior leaders address values, directions, and performance expectations, as well as a focus on customers and other stakeholders, empowerment, innovation, and learning. Also examined are an organization's governance and how the organization addresses its public responsibilities.
2. Strategic Planning: This category examines how an organization develops strategic objectives and action plans. Also examined is how the chosen objectives and plans are deployed and how progress is measured.
3. Customer and market focus: This category examines how an organization determines requirements, expectations, and preferences of customers and markets.
4. Measurement, analysis, and knowledge management: This category examines how an organization selects, gathers, analyzes, manages, and improves its data, information and knowledge assets.
5. Human resource focus: This category examines how an organization's work systems and employee learning and motivation enable employees to develop and utilize their full potential in alignment with the organization's overall objectives and action plans.
6. Process Management: This category examines the key aspects of an organization's process management, including key product, service, and business processes for creating customer and organizational value, and key support processes involving all work units.
7. Business results: This category examines an organization's performance and improvement in key business areas – customer satisfaction, product and service performance, financial and marketplace performance, human resource results, operational performance, and governance and social responsibility. Also examined are performance levels relative to competitors.

B.2 Criteria Evolution

Over the years, the criteria have been streamlined and simplified to make them more relevant and useful to organizations of all types and sizes. For example, the initial set of criteria in 1988 had 62 items with 278 areas to address. By 1991, the criteria had only 32 items and 99 areas to address. The 1995 criteria were reduced to 24 items and 54 areas to

address. In 1997 further refinements to develop the shortest list of key requirements necessary to compete in today's marketplace, improve the linkage between process and results, and make the criteria more generic and user-friendly resulted in 20 items and 30 areas to address. In 1999, the criteria were reworded in a question format that managers can easily understand. Since 2003, the criteria strengthened its emphasis on organizational governance and ethics. In 2007, new education criteria were released and will be discussed in details below.

B.3 MBNQA education criteria for performance excellence goals

- Delivery of ever-improving value to students and stakeholders, contributing to education quality and organizational stability.
- Improvement of overall organizational effectiveness and capabilities.
- Organizational and personal learning.

B.4 MBNQA education criteria core values and concepts

The criteria are built on the following set of interrelated core values and concepts:

1. Visionary leadership: Your institution's senior leaders should set directions and create a student-focused, learning-oriented climate; clear and visible values; and high expectations.
2. Learning-centered education: In order to develop the fullest potential of all students, institutions need to afford them opportunities to pursue a variety of avenues to success. Learning-centered education supports this goal by placing the focus of education on learning and the real needs of students.
3. Organizational and personal learning: Achieving the highest levels of organizational performance requires a well-executed approach to organizational and personal learning.
4. Valuing faculty, staff, and partners: valuing the people in your workforce means committing to their satisfaction, development, and well-being.
5. Agility: Success in today's ever-changing, globally competitive environment demands agility – a capacity for faster and more flexible responses to the needs of your students and stakeholders.
6. Focus on the future: Pursuit of educational excellence requires a strong future orientation and a willingness to make long-term commitments to students and key stakeholders.
7. Managing for innovation: Innovation means making meaningful change to improve an institution's programs, services, processes, and operations and to create new value for the organization's stakeholders.
8. Management by fact: Institutions depend on the measurement and analysis of performance. Such measurements should derive from the institution's needs and strategy, and they should provide critical data and information about key processes and results.
9. Social responsibility: An institution's leaders should stress responsibilities to the public, ethical behavior, and the need to practice good citizenship.
10. Focus on results and creating value: An institution's performance measurements need to focus on key results. Results should be used to create and balance value for your students and for your stakeholders.

11. Systems perspective: A systems perspective includes your senior leaders' focus on strategic directions and on your students and stakeholders. It means that your senior leaders monitor, respond to, and manage performance based on results. A systems perspective also includes using your measures, indicators, and organizational knowledge to build your key processes and aligning your resources to improve overall performance and satisfy students and stakeholders. Thus, a systems perspective means managing your whole institution, as well as its components, to achieve success.

The core values and concepts are embodied in seven categories as follows: leadership; strategic planning; student, stakeholder, and market focus; measurement, analysis, and knowledge management; workforce focus; process management; results. The criteria focus on the key areas of organizational performance given below:

1. Student learning outcomes.
2. Student and stakeholder-focused outcomes.
3. Budgetary, financial, and market outcomes.
4. Workforce-focused outcomes.
5. Process effectiveness outcomes, including key operational performance results.
6. leadership outcomes, including governance and social responsibility results.

B.5 ISO 9000 and Baldrige

Although both frameworks are process-focused, data-based, and management-led, each offers a different emphasis in helping organizations improve performance and increase customer satisfaction. For example, Baldrige focuses on performance excellence for the entire organization in an overall management framework, while ISO focuses on product and service conformity for guaranteeing equity in the marketplace and concentrates on fixing quality system problems and product and service nonconformities.

Although the 2000 revision of ISO 9000 incorporated many of the Baldrige criteria's original principles, it still is not a comprehensive business performance framework. Nevertheless, it is an excellent way to begin a quality journey. Thus, for companies in the early stages of developing a quality program, the standards enforce the discipline of control that is necessary before they can seriously pursue continuous improvement. The requirements of periodic audits reinforce the stated quality system until it becomes ingrained in the institution.

B.6 Deming and Baldrige

It is no secret that Deming was not an advocate of the Baldrige Award. Joseph Juran, however, was highly influential in its development. The competitive nature of the award is fundamentally at odds with Deming's teachings. However, many of Deming's principles are reflected directly or in spirit within the criteria.

C. European Quality Award

In October 1991, the European Foundation for Quality Management (EFQM) in partnership with the European Commission and the European Organization for Quality

announced the creation of the European Quality Award. The award was created to increase awareness throughout the European community, of the growing importance of quality in the increasingly global market. The European Quality Award consists of two parts: the European Quality Prize, given to companies that demonstrate excellence in quality management practice by meeting the award criteria, and the European Quality Award, awarded to the most successful applicant. In 1992, four prizes and one award were granted for the first time.

Applicants must demonstrate that their TQ approach has contributed significantly to satisfying the expectations of customers, employees and other constituencies. The award process is similar to the Deming Prize and Baldrige Award. The fundamental concepts are:

- Results orientation: excellence is achieving results that delight all the organization's stakeholders.
- Customer focus: Excellence is creating sustainable customer value.
- Leadership and constancy of purpose: excellence is visionary and inspirational leadership, coupled with constancy of purpose.
- Management by process and facts: excellence is managing the organization through a set of interdependent and interrelated systems, processes and facts.
- People development and involvement: excellence is maximizing the contribution of employees through their development and involvement.
- Continuous learning, innovation and improvement: excellence is challenging the status quo and effecting change by utilizing learning to create innovation and improvement opportunities.
- Partnership development: excellence is developing and maintaining value-adding partnerships.
- Corporate social responsibility: Excellence is exceeding the minimum regulatory framework in which the organization operates and to strive to understand and respond to the expectations of their stakeholders in society.

The EFQM publication for the new millennium of the so-called "Excellence Model" provides a framework which organizations can use to follow then new steps:

1. Set direction through leadership.
2. Establish the results you want to achieve.
3. Establish and drive policy and strategy.
4. Set up and manage appropriately your approach to processes, people, partnerships and resources.
5. Deploy the approaches to ensure achievement of the policies, strategies, and thereby the results.
6. Assess the business performance, in terms of customers, your own people, and society results.
7. Assess the achievements of key performance results.
8. Review performance for strengths and areas for improvement.
9. Innovate to deliver performance improvements.
10. Learn more about the effects of the enablers on the results.

D. Canadian Awards for Business Excellence

Canada's National Quality Institute (NQI) recognizes Canada's achievers of excellence through the prestigious Canada Awards for Excellence. NQI is a nonprofit organization designed to stimulate and support quality driven innovation within all Canadian enterprises and institutions, including business, government, higher education, and health care. The major criteria used for these awards include:

1. Leadership: strategic direction, leadership involvement, and outcomes.
2. Customer focus: voice of the customer, management of customer relationships...
3. Planning for improvement: development and content of improvement plan, assessment, outcomes...
4. People focus: human resource planning, participatory environment, continuous learning environment...
5. Process optimization: process definition, process control, process improvement, and outcomes...

E. Australian Business Excellence Award

Four levels of awards are given:

1. The Business Improvement Level: encouragement recognition for "Progress toward Business Excellence" or "Foundation in Business Excellence".
2. The Award Level: representing Australian best practices, recognition as a winner or finalist.
3. The Award Gold Level: open only to former Award winners; represents a revalidation and ongoing improvement.
4. The Australian Business Excellence Prize: open only to former Award winners; represents international best practices evident throughout the organization.

The assessment criteria address leadership, strategy and planning, information and analysis, people, customer focus, processes, products and services, and organizational performance in which customer focus should be the driver of the management system.

VII. Quality Tools Applicable to Higher Education

A. Brainstorming

- Definition: the open, uninhibited generation of ideas by a group.
- Utility: the purpose of brainstorming is to generate a wide variety of ideas, to ensure that everyone on the team becomes involved, to assure that nothing is overlooked, and to provide an atmosphere in which creativity can flourish, and we can break out of conventional thought. Any time group input is required. Problem selection, identifying cause and effect, group consensus efforts, and many others are good examples of the use of brainstorming.
- Construction:
 - a. Facilitator announces and records the question or topic to brainstorm.
 - b. Facilitator provides rules if none have been determined previously (Rules- No criticism (verbal or nonverbal); take turns-each person should have equal, ample opportunity to express ideas; quantity is important-the more the better...)
 - c. Members of the group take turns generating ideas. The facilitator makes sure this happens. Members have the right to pass at any point if they have no ideas. Each person may give one idea per person per turn.
 - d. Facilitator records the ideas as closely as possible to what was said and verifies the idea with contributor.

B. Affinity Diagram

- Definition: A tool to generate, organize, and consolidate information gathered through brainstorming.
- Utility: Affinity diagrams help to give a sense of the ideas that a group has concerning a given issue, provides an anonymous, nonjudgmental format for gathering group input. They give the group a sense of how serious a concern is because of the number of thoughts written on the issue. They also focus on how the group is similar in thought.
- Construction:
 - a. The leader states the problem or issue to be addressed.
 - b. Brainstorm and record all ideas, one per slip of paper, silently.
 - c. Post the ideas on a board or arrange on a table.
 - d. Have the entire group move the cards into piles by like ideas or common themes.
 - e. Name each group with a header that summarizes the content.
 - f. List all ideas under the categories or tape up ideas under headers to create the diagram.
 - g. Discuss the piles. Look at frequency of recurring themes, ask questions as needed and address next steps.

C. Cause-and-Effect Diagram

- Definition: Also known as the Fishbone or Ishikawa Diagram, a Cause-and Effect diagram is a picture of many system elements (causes) that may contribute to a

problem (effect). It is organized output from a brainstorming session concerning “what causes.....?”

- Utility: A Cause-and-Effect diagram is useful whenever root causes of a problem need to be identified to find effective solutions. It allows a group to organize many ideas around a central theme of effect. Cause-and-Effect diagrams help teams locate both special and common causes of variation.
- Construction:
 - a. Name the problem or effect the team will be analyzing.
 - b. Record the statement for all to see.
 - c. Draw and label the main bones by category. Typical categories may be people, methodology, curriculum, materials, assessment, and others.
 - d. Ask the team to brainstorm likely causes.
 - e. Record all ideas on the chart under the logical category or categories, if a cause fits under more than one category.
 - f. Ask the team, through consensus, to identify the most likely causes.

D. Check sheet/Matrix

- Definition: A tool to collect and organize data in a way that makes both collection and interpretation clear and understandable.
- Utility: Check sheets and matrices are useful when specifics in the data collection need to be reported. The block format makes the collection easier, and the clear categories make understanding and interpretation more clear.
- Construction:
 - a. Determine the data to be collected and reported.
 - b. Identify categories within the measurement that are of interest to you (types of errors, types of assignments, students...).
 - c. Construct the Check sheet/Matrix in a format that is useful to you.
 - d. Test the Check sheet/Matrix.
 - e. Collect the data.

E. Flowchart

- Definition: A drawing of any process, using standard symbols, that includes tasks, decisions, paperwork, and others in a sequence in which they occur.
- Utility: A flowchart provides a common understanding of the process as it currently operates or as it is projected to operate. It defines the system the team will study. The flowchart can be studied to look for ways to streamline, simplify, error-proof, and redesign the system. It also can be useful in system design to show how a system will work.
- Construction:
 - a. Define the boundaries to the process (Where does it start? Where does it stop?)
 - b. Observe the process in operation; ask people how work is done or should be done, and note the order in which steps occur.
 - c. List the major steps in the process (tasks and decisions)
 - d. Using the symbols, draw the flowchart.
 - e. study your flowchart.

F. Force-Field Analysis

- **Definition:** A tool to assess the likelihood of accomplishing a change. The tool defines driving forces, or any resources, attitudes, experience, and so on, that will support the change, and restraining forces as any resources, attitudes, or experiences that will cause the change to be stopped or delayed. Set-up in a two-column format (driving and restraining), with the desired change listed across the top of the page, the tool relies heavily on group input through some form of brainstorming.
- **Utility:** Force-Field analysis should be used whenever a change needs to be initiated as part of process improvement. It is useful that it not only provides a complete picture of what will be working for you and what will be working against you, but also because the group can move closer to consensus on the change by discussing the challenges and barriers in an open constructive format. Instead of negative conversation going underground, it is now legitimate to talk about it in the meeting.
- **Construction:**
 - a. Define the desired change and list at the top of the page.
 - b. Brainstorm the driving forces (resources, attitudes, experiences that will support the change). List on the left-hand column.
 - c. Brainstorm the restraining forces (resources, attitudes, experiences that will resist the change). List on the right-hand column.
 - d. Prioritize forces on both sides to determine what are the strongest drivers and restrainers.
 - e. Match and use drivers wherever possible to reduce and eliminate restrainers. Allow for conversation about how to approach the change.
 - f. Write an action plan at the bottom of the diagram.

G. Lotus Diagram

- **Definition:** A tool to expand thinking around a single topic. The expansion may include types, categories, details, or questions around a theme. It is a simple, effective way to organize the output around brainstorming.
- **Utility:** The Lotus is a good choice to organize the output of brainstorming around any central theme.
- **Construction:**
 - a. Identify the central topic or theme the group is to deal with.
 - b. Ask for the type of expansion you would like the group to make.
 - c. Record or ask the group to record the responses in the blocks around the lotus. You may use a lotus form, or simply fold a piece of paper into thirds both length-wise and width-wise.
 - d. Discuss the lotus and use it for its intended purpose.

H. Nominal Group Technique (NGT)/Light Voting

- Definition: A structured group process used to help teams make decisions without falling into voting or other decision-making modes that can divide the team.
- Utility: It gives everyone on the team an equal voice in the decision and reduces the pressure of traditional decision-making model to conform. It is used anytime the team needs to generate and choose a course of action for improvement (may be used several times during the course of the improvement process).
- Construction:
 - a. Leader writes the defined area of opportunity or problem to be addressed.
 - b. The group silently generates action items.
 - c. Ideas are stated and recorded.
 - d. Each item on the list is discussed to clarify understanding, not to promote or sell ideas.
 - e. Leader will establish criteria for the voting.
 - f. Leader conducts the vote
 - g. Results are discussed.

I. Pareto Diagram

- Definition: ranks data in categories from largest to smallest in terms of frequency of occurrence, cost, or time. Evaluates related measures of a problem or categories.
- Utility: A Pareto diagram is useful because it graphically represents the categories and their value, and helps an improvement team separate the ‘significant few’ categories from the “trivial many” in order to focus their efforts on an area that will yield the most significant results. Any time data can be stratified (separated by type or category), a Pareto is useful. This includes project selection, cause analysis, and location identification.
- Construction:
 - a. Choose logical categories to stratify your data.
 - b. Specify the time period you will collect data.
 - c. Collect the data on to a frequency table.
 - d. Draw and scale the horizontal and vertical axes.
 - e. Draw and label the bars for each category.
 - f. Review the chart, using these data to focus the team’s efforts.

J. Radar Chart

- Definition: A graph with multiple scales to report self-assessed knowledge or competence, often several points in time.
- Utility: A Radar chart is used to identify current level of self-assessed knowledge or competence, and then monitor change or growth across several factors.
- Construction:
 - a. Determine the critical factors, competencies, skills, or bits of knowledge you need to assess.
 - b. Draw the radar and identify the various spikes by characteristic you are assessing.

- c. Determine the scale (numbers often from 0 to 5) and definitions of what each number means, and mark both on the chart.
- d. Duplicate the chart, one per person.
- e. Ask the group to self-report and mark on the radar chart with a date or symbol indicating first measurement.
- f. Determine the next measurement point and repeat (e).
- g. Analyze data and compare results, if appropriate. You can choose to do a cumulative average of the group by adding and averaging the entire group's scores.

K. Relations Diagram

- Definition: A picture of the cause-and effect relationships between elements of a problem.
- Utility: A Relations diagram helps teams distinguish between causes and effects and get to root cause(s) and effect(s) of a problem when the group cannot reach consensus on its own. It is particularly useful when the group or team is struggling to get to root cause of a problem because of either the problem's complexity or the symptoms being more visible than the causes.
- Construction:
 - a. The leader clearly defines the issue or problem.
 - b. Construct the diagram layout with the effect in the center of the diagram and all suspected causes, one per block, around the center.
 - c. Analyze as a team the relationship between each two factors. Draw arrows from those that influence to those that feel the effect.
 - d. Count and list the arrows in and the arrows out for each cause category.
 - e. Identify the root causes (many arrows out, few arrows in) and the root effects (many arrows in, few arrows out).
 - f. As a team, study the final diagram to determine root cause and next action steps.

L. Run/Control Charts

- Definition: A graphic representation of system performance over time. A control chart helps us to determine if a system is stable and predictable over time and gives a team baseline data against which to mark future changes. Both variable and attribute data can be placed on control charts.
- Utility: A Run/Control Chart can tell what kind of variation is at work on your system, and give an assessment of your systems performance over time. It can help avoid undercontrolling or overcontrolling your system by understanding what is normal, predictable variation and what is not. At the beginning of every improvement project, a team should evaluate the system performance to help gather baseline of results data against which all changes can be evaluated.
- Construction:
 - a. Begin by planning how and where you will get your data.
 - b. Complete the chart identifier information and record the data on the sheet.
 - c. Calculate the process average.
 - d. Calculate the upper and lower control limits.

- e. Determine the scaling for the chart on the paper form, draw the center and control lines, and plot the points.
- f. Interpret the chart.

M. How These Tools Can Help

Using these quality tools as part of the continuing improvement process will help faculty and students to gain and sustain results.

You can use these tools as part of a “plan-do-study-act” process (PDSA), first created by W. Edwards Deming, one of the leaders of the quality movement.

- **Plan:** Assess where you are and where you want to be, identify strengths and barriers to improvement, and decide what you need to change.
- **Do:** Implement changes on a small scale or trial basis.
- **Study:** Using data, identify if your changes made a difference.
- **Act:** Set the process in motion and continuously assess results.

VIII. Success Stories at the university level

A. Introduction

Many international colleges and universities have made substantial commitments to quality efforts –sometimes through partnerships with business/industry. In fact, business plays an important role in fostering quality improvement efforts in higher education by transferring knowledge and expertise on quality processes and implementation practices.

B. Purdue University

In 1989 Xerox Corporation hosted its first Quality Forum, a gathering of academic and business leaders. Business leaders urged academia to teach quality principles and to use them in managing their organizations. Many companies established partnerships with colleges and universities. For example, Motorola's partnership with Purdue University led to the formation of the university's continuous quality improvement approach called Excellence 21, which is a systemwide effort by the university to explore the principles of continuous improvement and TQM. Projects were developed in the areas of:

- Faculty and staff development and worklife enrichment.
- Assessment of student learning outcomes.
- Student services
- Quality of undergraduate/graduate education.
- Administrative processes.
- Technology

C. Penn State University

Another example is Penn State University which is a mega university that serves more than 81000 students each year on 24 campuses. Since the early 1990s the university has shown a consistent commitment to continuous quality improvement (CQI) efforts. Each year, Penn state hosts a quality expo to “share, learn, and celebrate” quality improvements and quality champions”. One example of a noteworthy project is the following:

By eliminating several steps in the processing of new faculty appointments, a CQI team in the dean's office of the College of Health and Human Development saved 500 to 750 hours per year.

D. Binus University

BINUS, an Indonesian university, felt that the application of quality management principles in the university is urgent. The university quality management system, started by BINUS University in 1996, has been acknowledged internationally in 1997. BINUS achieved ISO 9001 certificate on November 17, 1997 because of its application of the quality management system in the scope of curriculum design and lecture materials, teaching and research...According to BINUS, obtaining the certification was not an easy matter. BINUS underwent six stages processes: preparation; document compilation; implementation and auditing; improvement and prevention; and finally the certification itself. BINUS believes that ISO 9001 is the ultimate recognition of global quality. The achievement has made BINUS aware that quality is the most important thing-its application, maintenance, and continuous improvement. To show continued interest, the certification has been renewed on February 10, 2005.

E. University of Wisconsin - Stout

On March 7, 2002, US President Bush and Commerce Secretary Don Evans presented five organizations with Malcolm Baldrige National Quality Awards in recognition of their performance excellence and quality achievements. Among the winners was the University of Wisconsin-Stout (UWS), which won in the education category. Previously, there had been no winners in the education category.

The 110-year old university employs about 1200 people, serving nearly 8000 students. Its annual operating budget is US\$95 million, with which UWS offers 27 undergraduate and 16 graduate degrees through three colleges.

Nearly half of UWS programs are unique within the university and several are not offered anywhere else in the US. This distinctive array of degree offerings stems from UWS's "mission driven-market smart" focus aimed at developing students for careers in industry and education. The university began conducting student satisfaction surveys in the mid 1970s. The results of these and other analyses are helping UWS to sharpen its "Mission-driven-market smart" focus to the benefit of students and employees alike. Since 1996, the job placement rate for graduates has been at or above 98%. Alumni earn salaries that exceed the national average from other institutions. Moreover, 99% of employers surveyed rate UWS graduates as well prepared. Such results also lead to satisfaction. For example, 90% of graduate program alumni and almost 90% of undergraduate alumni say that, if they could do it over again, they would choose to attend UWS.

In an interview with Charles Sorensen, the university's chancellor for the past 14 years, he mentioned the most difficult part about getting to the Baldrige level was "reinventing the campus, by seeing the campus not as a collection of isolated departments, but as a set of systems that all relate to one another in some way. It sounds simple, but it wasn't." He added that the major quality improvements they've seen during the Baldrige journey are "we think differently at this campus today. We think in terms of improving everything on a continual basis. We don't look backward anymore. There's been constant improvement in every process we have. We think with more vision than we ever did before, always looking ahead five years at what we want to become and how we're going to get there."

IX. Managing the Change

A. Introduction

The principles of total quality-focus on the customer, involve everyone, and continuously improve- are simple to understand and represent common sense. Yet many institutions have experienced great difficulty in implementing total quality and even deciding whether to do it. This difficulty often results from some common mistakes, such as that TQ means doing lots of 'things' like collecting data, organizing teams, or that it only applies to large companies. A total quality strategy does, however, require significant changes in institutional design, processes, and culture. Such broad change has been a stumbling block for many companies, and researchers have noted that upwards of 70% of all change initiatives fail.

B. Change Management

Change makes people uncomfortable, thus, managing change is seldom pleasant. Change management usually requires a well-defined process, just like any other business process. Thinking of change management as a process helps to define the steps necessary to achieve the desired outcomes. It also forces the institution to think of its employees as customers who will be affected by the change. Most change processes include three basic stages. The first stage involves questioning the institution's current state and dislodging accepted patterns of behavior. The second stage is a state of flux, where new approaches are developed to replace suspended old activities. The final period consists of institutionalizing the new behaviors and attitudes. An accumulation of continuously improving process changes can also lead to a positive and sustainable culture change.

C. Implementation Barriers to creating a TQ culture

Numerous barriers exist to successfully transform institutions to a sustained culture of total quality. Understanding these barriers can help significantly in managing this change process.

One reason for TQ failure is a lack of what Deming called "constancy of purpose" in his original version of the 14 Points. The people who implement quality initiatives often have conflicting goals and priorities. Other institutions continually try to implement the latest fads, only to disband them after a short time in favor of something else. This inconsistency causes an incredible amount of cynicism on the part of the workforce. An institution must have a clear understanding of why it is embarking on a total quality effort and must stay focused for the long haul.

Another reason for failure is the lack of the holistic view of quality. Many approaches to "implementing quality" are one-dimensional and are consequently prone to failure.

Another danger lies in the lack of understanding cultural issues and the tendency to imitate others. Research has shown that imitation of TQ efforts made by one successful organization may not lead to good results in another.

Another barrier is ignoring "What's in it for me?" question which can destroy – and it has in numerous cases – any TQ effort. Aligning the institution is a challenging task that is accomplished through a sound strategy and effective deployment. The most damaging alignment problem to which many TQ failures have been attributed is the lack of alignment between expectations that arise from TQ change processes and reward systems.

Other problems include the organizational culture which remains one of "command and control" and is driven by fear or game-playing, budgets, schedules, or bureaucracy; and

the overemphasis on cross-functional teams which leads to neglect individual efforts for local improvements.

Although the above list is extensive, it is by no means exhaustive. It reflects the immaturity that many institutions exhibit when trying to implement TQ. TQ requires a new set of skills and learning, including interpersonal awareness and competence, team building, encouraging openness and trust, listening, giving and getting feedback, group participation, problem solving, clarifying goals, resolving conflicts, delegating and coaching, empowerment, and continuous improvement as a way of life.

D. Sustaining the quality institution

Getting started often seems easy by comparison with sustaining a quality focus. Sustaining total quality requires viewing quality efforts as a journey, not an end, as well as the ability to develop into a “learning organization”.

Successful TQ organizations realize that quality is a never-ending journey. Therefore, both the culture and the organizational structure should be designed to support the established direction in which the organization is moving, and modified whenever that direction changes significantly. Senior management, especially those who do not understand the nature of leadership, are often hesitant to make needed institutional changes as the institution grows, even when the need for change becomes obvious. This need to change is embodied in a concept called the “learning organization”. Peter Senge, an MIT professor, has become the major advocate of the learning organization movement. He defines the learning organization as “...an organization that is continually expanding its capacity to create its future. For such an organization, it is not enough merely to survive. Survival learning or what is often termed adaptive learning is important—indeed it is necessary. But for a learning organization, adaptive learning must be joined by generative learning, learning that enhances our capacity to create”.

Learning organizations are skilled in creating, acquiring, and transferring knowledge and in modifying the behavior of their employees and other contributors to their institutions. They are good at performing the following activities: systematic problem solving; experimentation with new approaches; learning from their own experiences and history; learning from the experiences and best practices of others, and transferring knowledge quickly and efficiently throughout the organization. These characteristics will definitely help the institution sustain a quality focus.

E. Self-Assessment Processes

One way for institutions to build and subsequently sustain a TQ institution is to conduct self-assessments—which will be the focus of guide II- of where it stands relative to best practices and key requirements. Self-assessment should identify both strengths and opportunities for improvement, creating a basis for evolving toward higher levels of performance. Thus, a major objective of most self-assessment projects is the improvement of institutional processes based on opportunities identified in the evaluation. Self-assessment is the holistic evaluation of processes and performance. The self part of the term means that it should be conducted internally which promotes greater involvement of the institution’s faculty, staff, and senior administrators, yielding a higher level of understanding and buy-in.

F. The importance of follow-up

The lack of follow-through might seem a bit surprising. Why would institutions take the time to conduct a self-assessment and then not follow up on the results?

Some senior administrators may not follow up because they truly do not sense problem- despite information suggesting otherwise. Often, however, they get the message but choose not to respond. They react negatively or by denial. Others may not know what to do with the information.

Senior administrators must take a positive approach to self-assessment findings, no matter how unpleasant they might appear. Action plans must be set to identify particular activities- that may include preparing for institutional accreditation which is the subject of guide III - necessary to address the improvement opportunities. Many senior administrators consider their job finished when action plans are set in motion. However, planned changes are rarely implemented as initially intended. Moreover, people responsible for implementing the plans may need to use encouragement or involvement in order to effectively execute their portions of the intended change. Change implementation demands a second component of effective follow up – tracking the progress of action plan execution – to provide feedback on whether the intervention is effective.

X. Glossary of Terms Related to Quality in Higher Education

Academic recognition: Academic recognition is a set of procedures and processes for the acknowledgement and acceptance (subject to conditions), between institutions and countries, of higher education qualifications.

Academic year: The academic year is:

1. the duration of a specific program of study (which may not last a complete 12 months and is divided into terms, semesters or quarters)
2. the start and finish dates of the annual cycle of an institution of higher education.

Access / Accessibility: Access is the process of enabling entry to higher education.

Access courses: Access courses are preparatory programs for students to gain entry to higher education.

Accountability: Accountability is the requirement, when undertaking an activity, to expressly address the concerns, requirements or perspectives of others.

Accreditation: Accreditation is the establishment or of the status, legitimacy or appropriateness of an institution or program of study.

Accreditation body: An accreditation body is an organization delegated to make decisions, on behalf of the higher education sector, about the status, legitimacy or appropriateness of an institution, or program.

Accreditation of Prior Experiential Learning (APEL): APEL is the formal acknowledgement (based on professional assessment) of learning acquired from previous experience, usually from experience unrelated to an academic context.

Accreditation of Prior Learning (APL): Formal acknowledgement (based on professional assessment), by way of granting credit, of students' previous learning: credit is given towards a program of study or towards professional body accreditation.

Accreditation duration: Accreditation decisions are usually limited to a fixed and stated period of time, after which the institution or program is required to engage with a more or less rigorous re-accreditation process.

Accreditation status: Accreditation status is the embodiment of the decision made by the accreditation body.

Accreditation survey: Accreditation survey is a term mainly applicable in the US context and refers to a process of checking compliance.

Accreditors: Accreditors are agencies that provide recognition to institutions as part of an accreditation process

Action: Action is a term used in the United States to imply a judgment or decision following an accreditation.

Additional learning opportunities: Additional learning opportunities are elements of the program of study that augment the usual classroom teaching of the syllabus content.

Adverse action: Adverse action is a term used in the US to refer to failure to achieve/retain accreditation.

Agency: Agency is, in the context of quality in higher education, shorthand for any organization that undertakes any kind of monitoring, evaluation or review of the quality of higher education.

Aim: An aim is an overall specification of the intention or purpose of a program of study or institutional mission or policy.

Alumnus: An alumnus (plural alumni) is a graduate of an institution.

Appraisal of student learning: Appraisal of student learning is the process of providing formative and summative feedback to students on the development of their learning

Assessment: A general term that embraces all methods used to judge the performance of an individual, group or organization.

Assessment of student learning: Assessment of student learning is the process of evaluating the extent to which participants in education have developed their knowledge, understanding and abilities.

Assessment of teaching and learning: Assessment of teaching and learning is the process of evaluating the quality and appropriateness of the learning process, including teacher performance and pedagogic approach.

Assurance: Assurance of quality in higher education is a process of establishing stakeholder confidence that provision (input, process and outcomes) fulfils expectations or measures up to threshold minimum requirements.

Audit: Audit, in the context of quality in higher education, is a process for checking that procedures are in place to assure quality, integrity or standards of provision and outcomes.

Audit report: An audit report is a codification of the process, findings and outcomes of the audit process, usually prepared by the auditors and project team.

Autonomy: Autonomy is being able to undertake activities without seeking permission from a controlling body.

Bachelor-master's: Bachelor-master's is the shorthand for a two-cycle system of higher education that is being introduced across the European Higher Education Area as part of the Bologna process.

Bachelor degree: A bachelor degree is the first-level higher education award, usually requiring three or four years' study but more in some medical subjects.

Benchmarking: Benchmarking is a process that enables comparison of inputs, processes or outputs between institutions (or parts of institutions) or within a single institution over time.

Blended learning: Blended learning is a flexible approach that combines face-to-face teaching/learning with remote (usually internet-based) learning.

Bologna process: The Bologna Process is an ongoing process of integration and harmonization of higher education systems within Europe.

Certification: Certification is the process of formally acknowledging achievement or compliance: it can be used to signify the achievement of an individual, such as a student, or of an institution.

Classification: Classification is the process of identifying types of institution based on their core functions or economic status.

Comparability: Comparability is the formal acceptance between two or more parties that two or more qualifications are equivalent.

Competence: Competence is the acquisition of knowledge skills and abilities at a level of expertise sufficient to be able to perform in an appropriate work setting (within or outside academia).

Compliance: Compliance is undertaking activities or establishing practices or policies in accordance with the requirements or expectations of an external authority.

Continuing education: Continuing education is:

1. a generic term for any program of study (award-bearing or not) beyond compulsory education.
2. post-compulsory education of a short-term nature that does not lead directly to a major higher education qualification.

Continuing professional development (CPD): Continuing professional development (CPD) refers to study (that may accumulate to whole programs with awards) designed to upgrade knowledge and skills of practitioners in the professions.

Control: Control is the process of regulating or otherwise keeping a check on developments in higher education.

Co-operative education: Co-operative education includes work experience as part of the learning experience.

Corrective action: Corrective action is process of rectifying problems.

Correspondence course: A correspondence course is a study unit undertaken by the student remotely from campus via written communication with teachers.

Credit: Recognition of a unit of learning, usually measured in hours of study or achievement of threshold standard or both.

Credit accumulation: Credit accumulation is the process of collecting credit for learning towards a qualification.

Credit transfer: Credit transfer is the ability to transport credits (for learning) from one setting to another.

Criteria: Criteria are the specification of elements against which a judgment is made.

Criteria-referenced assessment: Criteria-referenced assessment is the process of evaluating against a set of pre-specified criteria.

Curriculum: Curriculum is the embodiment of a program of learning and includes philosophy, content, approach and assessment.

Degree: Degree is the core higher education award, which may be offered at various levels from foundation, through bachelors, masters to doctoral.

Diploma: Diploma is:

1. a generic term for a formal document (certificate) that acknowledges that a named individual has achieved a stated higher education award
2. an award for a specific level of qualification (diploma level) which in some countries is between a bachelor and a masters-level award
3. a term for any award beyond bachelors level up to but excluding doctoral level awards, including continuing education certification.

Diploma supplement: A diploma supplement is a detailed transcript of student attainment that is appended to the certificate of attainment of the qualification.

Dissertation: A dissertation is an extended (usually written) project involving research by the student, which contributes significantly towards a final assessment for a (higher) degree.

Distance education: Distance education is higher education undertaken by students in a setting remote from the physical campus of the higher education institution.

Distributed education: Distributed education occurs when the teacher and student are situated in separate locations and learning occurs through the use of technologies (such as video and internet), which may be part of a wholly distance education program or supplementary to traditional instruction.

Doctoral degree: The doctoral degree is the highest level of award in most higher education systems.

Effectiveness: Effectiveness is the extent to which an activity fulfils its intended purpose or function.

Efficiency: Efficiency is the extent to which an activity achieves its goal whilst minimizing resource usage.

Employability: Employability is the acquisition of attributes (knowledge, skills, and abilities) that make graduates more likely to be successful in their chosen occupations (whether paid employment or not).

European Credit Transfer System (ECTS): ECTS is a system for recognizing credit for learning and facilitating the movement of the recognized credits between institutions and across national borders.

Evaluation: Evaluation (of quality or standards) is the process of examining and passing a judgment on the appropriateness or level of quality or standards.

Ex-ante assessment: Ex-ante assessment involves undertaking an evaluation of the conditions for the launch of a program or institution.

Excellence: Excellence means exhibiting characteristics that are very good and, implicitly, not achievable by all.

Ex-post assessment: Ex-post assessment involves undertaking a review of an operational program or institution.

External evaluation: External evaluation is:

1. a generic term for most forms of quality review, enquiry or exploration.
2. a process that uses people external to the program or institution to evaluate quality or standards.

External evaluation team: External evaluation team is the group of people, including persons external to the program or institution being reviewed, who undertake the quality evaluation.

External examiner: An external examiner is a person from another institution or organization who monitors the assessment process of an institution for fairness and academic standards.

External expert: External expert is someone with appropriate knowledge who undertakes a quality or standards review (of any kind) as part of a team or alone and who is external to the program or institution being reviewed.

External institutional audit: An external institutional audit is a process by which an external person or team check that procedures are in place across an institution to assure quality, integrity or standards of provision and outcomes.

External quality monitoring (EQM): External quality monitoring (EQM) is an all-encompassing term that covers a variety of quality-related evaluations undertaken by bodies or individuals external to higher education institutions.

External review indicator: An external review indicator is a measurable characteristic pertinent to an external quality evaluation.

External sub-institutional audit: An external sub-institutional audit is a process by which an external person or team check that procedures are in place to assure quality, integrity or standards of provision and outcomes in part of an institution or relating to specific aspect of institutional provision or outcomes.

Faculty: Faculty is:

1. the organizational unit into which cognate disciplines are located in a higher education institution
2. a shorthand term for the academic (teaching and research) staff in a higher education institution.

Faculty review: Faculty review has two different meanings, the first based on faculty as a term for academic staff, the second based on faculty as an organizational unit:

1. Faculty review is a process of reviewing the inputs, process or outputs of a faculty as an organizational unit; its structure, mode of operation, mission, aims and objectives.
2. Faculty review, (meaning review of academic staff) evaluates the performance of researchers and teachers.

Fees: Fees are the financial contribution made by students to their higher education

Fitness of purpose: Fitness of purpose evaluates whether the quality-related intentions of an organization are adequate.

Follow up: Follow up is shorthand for procedures to ensure that outcomes of review processes have been, or are being, addressed.

Formal learning: Formal learning is planned learning that derives from activities within a structured learning setting.

Formative assessment: Formative assessment is evaluation of student learning that aids understanding and development of knowledge, skills and abilities without passing any final judgment (via recorded grade) on the level of learning.

Foundation program: A foundation program provides an introduction to degree-level study.

Franchise programs: Franchise programs are study units of one higher education institution adopted by and taught at another institution, although the students formally obtain their qualification from the originating institution.

Grading: Grading is the process of scoring or ranking student academic work as part of assessing student learning.

Graduate: A graduate is someone who has successfully completed a higher education program at least at bachelor degree level.

Higher degree: A higher degree is an award beyond the basic-level higher education qualification.

Higher education: Higher education is usually viewed as education leading to at least a bachelor's degree or equivalent.

Impact: Impact in the context of quality in higher education refers to the consequences that the establishment of quality processes (both internal and external) has on the culture, policy, organizational framework, documentation, infrastructure, learning and teaching practices, assessment/grading of students, learning outcomes, student experience, student support, resources, learning and research environment, research outcomes and community involvement of an institution or department.

Improvement: Improvement is the process of enhancing, upgrading or enriching the quality of provision or standard of outcomes.

Informal learning: Informal learning is:

1. learning that derives from activities external to a structured learning context.
2. Unstructured learning within a structured learning environment.

Inspection: Inspection is the direct, independent observation and evaluation of activities and resources by a trained professional.

Institution: Institution is shorthand for institution of higher education, which is an educational institution that has students graduating at bachelor degree level or above.

Internal evaluation: Internal evaluation is a process of quality review undertaken within an institution for its own ends.

Internal institutional audit: Internal institutional audit is a process that institutions undertake for themselves to check that they have procedures in place to assure quality, integrity or standards of provision and outcomes across the institution.

Internal sub-institutional audit: Internal sub-institutional audit is a process that an institution has for checking that procedures are in place to assure quality, integrity or standards of provision and outcomes within a department, faculty or other operational unit or that specific issues are being complied with across the institution.

Internal quality monitoring: Internal quality monitoring (IQM) is a generic term to refer to procedures within institutions to review, evaluate, assess, audit or otherwise check, examine or ensure the quality of the education provided and/or research undertaken.

Joint degree: A degree awarded by more than one higher education institution.

Learning outcome: A learning outcome is the specification of what a student should learn as the result of a period of specified and supported study.

League tables: League tables is a term used to refer to ranking of higher education institutions or programs of study.

Level:

1. Level refers to the complexity and depth of learning.
2. Level refers to the formally designated location of a part of a study program within the whole.

Licensing: Licensing is the formal granting of permission to (a) operate a new institution (b) a new program of study (c) practice a profession.

Lifelong learning: Lifelong learning is all learning activity undertaken throughout life, whether formal or informal.

Management audit: Management audit, in higher education, is a process for checking that management structures and abilities are appropriate for assuring quality, integrity or standards of provision and outcomes.

Master's degree: Master's degree is an award higher than a bachelor's degree.

Mobility: Mobility is shorthand for students and academics studying and working in other institutions, whether in the same country or abroad.

Mode: Mode of study refers to whether the program is taken on a part-time or full-time basis, or through some form of work-linked learning and may include whether taken on-campus or through distance education.

Module: A module is a formal learning experience encapsulated into a unit of study, usually linked to other modules to create a program of study.

Module specification: Module specification is statement of the aims, objectives/learning outcomes, content, learning and teaching processes, mode of assessment of students and learning resources applicable to a unit of study.

Monitoring: Monitoring has two meanings:

1. the specific process of keeping quality activities under review;
2. a generic term covering all forms of internal and external quality assurance and improvement processes including audit, assessment, accreditation and external examination.

Mutual recognition: Agreement between two organizations to recognize each other's processes or programs.

Norm-referenced assessment: Norm-referenced assessment is the process of evaluating (and grading) the learning of students by judging (and ranking) them against the performance of their peers.

Objective: An objective is:

- (a) a specific statement about what students are expected to learn or to be able to do as a result of studying a program: more specifically this is a learning objective;
- (b) a measurable operationalization of a policy, strategy or mission: this is an implementation objective.

Off-shore provision: Off-shore provision is the export of higher education programs from one country to another.

One-level degree structure: One-level degree structure is where a single program of study results in a final (masters-level) award.

Outcomes: Outcome is:

1. shorthand for the product or endeavors of a higher education institution (or sector), including student learning and skills development, research outputs and contributions to the wider society locally or internationally (institutional outcomes).
2. shorthand for learning outcome.

Outputs: Outputs refers to the products of higher education institutions: including, graduates, research outcomes, community/business activities and the social critical function of academia.

Oversight: Oversight, in the quality context, refers to the process of keeping a quality process or initiative under observation, such that a person or organization has a watching brief on developments.

Peer: Peer, in the context of quality in higher education, is a person who understands the context in which a quality review is being undertaken and is able to contribute to the process.

Peer Review: Peer review is the process of evaluating the provision, work process, or output of an individual or collective who operating in the same milieu as the reviewer(s).

Performance indicators: Performance indicators are data, usually quantitative in form, that provide a measure of some aspect of an individual's or organization's performance against which changes in performance or the performance of others can be compared.

Personal Development Planning (PDP): Personal development planning is a structured and supported process to assist students in arranging their own personal educational and career progression.

Postgraduate: A postgraduate is someone who is undertaking study at post-first degree level.

Preliminary study: Preliminary study is an initial exploration of issues related to a proposed quality review.

Prior learning: Prior learning is previous learning from informal and formal learning situations.

Process: Process, in the context of quality, is the set of activities, structures and guidelines that:

1. constitute the organization's or individual's procedures for ensuring their own quality /standards
2. constitute the mechanism for reviewing or monitoring the quality or standards of another entity.

Profession: A profession is a group of people in a learned occupation, the members of which agree to abide by specified rules of conduct when practicing the occupation.

Professional body: A professional body is a group of people in a learned occupation who are entrusted with maintaining control or oversight of the legitimate practice of the occupation.

Professional recognition: Professional recognition is the formal acknowledgement of an individual's professional status and right to practice the profession in accordance with professional standards and subject to professional or regulatory controls.

Program: is shorthand for a study curriculum undertaken by a student that has coordinated elements, which constitute a coherent named award.

Program accreditation: Programs accreditation establishes the academic standing of the program or the ability of the program to produce graduates with professional competence to practice.

Program evaluation: Program evaluation is a process of reviewing the quality or standards of a coherent set of study modules.

Program specification: A program specification documents the aims, objectives or learning outcomes, program content, learning and teaching methods, process and criteria for assessment, usually with indicative reading or other reference material as well as identifying the modules or subunits of the program, setting out core and optional elements, precursors and levels.

Progress file: A progress file is an explicit record of achievement, an aid to reflecting on the achievement and a mechanism to enable future planning.

Project team: The project team is the group of people, within a quality monitoring agency, who organize and arrange the external quality process.

Provision: Provision is an all-encompassing term that refers to the learning opportunities, research and community activity offered/undertaken by an institution of higher education.

Qualification: Qualification is the award to which a formal program of study contributes.

Quality: Quality is

1. (n) the embodiment of the essential nature of a person, collective, object, action, process or organization
2. (adj) means high grade or high status (as in a quality performance).
3. a shorthand, in higher education, for quality evaluation processes.

Quality control: Quality control is a mechanism for ensuring that an output (product or service) conforms to a predetermined specification.

Ranking: Ranking is a term used to refer to the rating and ordering of higher education institutions or programs of study based on various criteria.

Re-accreditation: Re-accreditation is the re-establishment or re-statement (usually on a fixed periodic cycle) of the status, legitimacy or appropriateness of an institution, program (i.e. composite of modules) or module of study or of the professional recognition of an individual.

Reciprocity: Reciprocity is the acceptance by one agency of the outcomes of a quality process conducted by another agency.

Recognition: Recognition is the formal acknowledgement of the status of an organization, institution or program.

Recognition of prior learning: Recognition of prior learning is formal acknowledgement of previous learning, from informal as well as formal learning situations.

Regional accreditation: Regional accreditation is recognition of an institution within a regional context: it is much the same as national accreditation but is not restricted to national boundaries.

Regulatory body: A regulatory body, in the context of higher education, is an external organization that has been empowered by legislation to oversee and control the educational process.

Report: Report (n.) is the documented outcome or results of an evaluation process.

Research assessment exercise (RAE): The RAE is a process, in the UK, that assesses the quality of research to enable the higher education funding bodies to distribute public funds on the basis of research quality ratings.

Review:

1. Review is generic term for any process that explores the quality of higher education.
2. Review refers to explorations of quality that do not result in judgments or decisions.

Review team: The review team is the group of people undertaking a quality monitoring or evaluation process.

Self-assessment: Self-assessment is the process of critically reviewing the quality of one's own performance and provision.

Semester: A semester is a division of the academic year; usually two semesters in a year.

Seminar: A seminar is, ideally, a small-group teaching situation in which a subject is discussed, in depth, by the participants.

Site visit: A site visit is when an external evaluation team goes to an institution to evaluate verbal, written and visual evidence.

Specialized accreditation: Specialized accreditation refers to any accreditation process that relates to specific discipline areas.

Stakeholder: A stakeholder is a person (or group) that has an interest in the activities of an institution or organization.

Summative assessment: Summative assessment is the process of evaluating (and grading) the learning of students at a point in time.

Substantial equivalency: Substantial equivalency is a term used in the US to indicate that an overseas program is essentially the same as a US program of study.

Thesis: Thesis is:

1. shorthand for doctoral thesis, the outcome of a student research at doctoral level.
2. an argument proposing and developing a theory about a substantive or conceptual issue.
3. an intellectual proposition.

Total student experience: Total student experience refers to all aspects of the engagement of students with higher education.

Transcript: A transcript is a printed or electronic record of student achievement while in higher education.

Transnational education: Transnational education is higher education provision that is available in more than one country.

Tuning: Tuning, in the context of quality in higher education, refers to the process in Europe of adjusting degree provision so that there are points of similarity across the European Higher Education Area.

Undergraduate: Undergraduate is a student who is undertaking a first-level degree program of study, normally a bachelor's degree or equivalent.

Unit: Unit has two meanings in the context of quality in higher education, one as subject and one as object of quality review

1. unit is the generic name for a quality monitoring department internal to an institution.
2. unit is any element that is the subject of quality review: institution, subject area, faculty, department or program of study.

Validation: Validation is a process of confirming that an existing program of study or a newly designed one can continue or commence operation.

Value for money: Value for money is one definition of quality that judges the quality of provision, processes or outcomes against the monetary cost of making the provision, undertaking the process or achieving the outcomes.

Work-based learning: Work-based learning refers to any formal higher education learning that is based wholly or predominantly in a work setting.

Work-related learning: Work-related learning refers to any formal higher education learning that includes a period of learning that takes place in a work setting or involves activities linked to a work setting.

XI. Important Quality in Higher Education Links

- European Association for Quality Assurance in Higher Education www.enqa.eu
- European Consortium for Accreditation www.eacaconsortium.net
- European Foundation for Quality Management www.efqm.org
- European Organization for Quality www.eoq.org
- United Kingdom Business Improvement Network www.bin.co.uk
- International Network for Excellence in Management Development www.efmd.org
- International Society for Performance Improvement www.ispi.org
- Council for Higher Education Accreditation www.chea.org
- American Society for Quality www.asq.org
- Academic Quality Improvement Program www.aqip.org
- International Organization for Standardization www.iso.org
- North Central Association Commission on Institutions of Higher Education www.ncaciche.org
- National Quality Institute www.nqi.ca
- Deming Institute www.deming.org
- Quality Gurus www.qualitygurus.com
- American Quality Mall www.americanquality.com
- Association to Advance Collegiate Schools of Business www.aacsb.edu
- Association of Specialized and Programmatic Accreditors www.aspa-usa.org
- Middle States Association of Colleges and Schools Commission on Higher Education www.msache.org
- Accreditation Board for Engineering and Technology www.abet.org

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