quality in higher education
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Quality experts believe that, ‘measuring customer satisfaction at an educational establishment might be regarded by educators as one of the greatest challenges of the quality movement’ (Cloutier & Richards, 1994, p. 117). This challenge is only one of several that surround quality improvement efforts in higher education. This paper focuses on identifying and evaluating techniques used to take on the challenges of quality improvement in higher education. This paper also examines two primary difficulties: first, definition of the customer; and second, measuring customer quality perceptions. An examination of representative historical applications of quality techniques was conducted as well as identification of the differences and similarities surrounding quality improvement efforts in each of three service areas typically found in higher education: academic, administrative, and auxiliary functions. While recognising these higher education areas differ from the typical business environment, positive research findings on the application of quality techniques for these areas were discovered.

Keywords: service quality; higher education; quality techniques; quality measurement; continuous improvement

Introduction
The most widely used quality improvement methodologies from industry are examined in the context of higher education: Total Quality Management (TQM); Quality Function Deployment (QFD); Six Sigma; ISO 9001; and the Malcolm Baldrige National Quality Award. TQM was found to have the largest number of historical applications in higher education, while QFD is gaining in popularity. Other techniques observed in industry have seen only limited use in higher education in the United States. The Academic Quality Improvement Program (AQIP), a continuous improvement technique used exclusively in higher education, highlights how higher education has adapted quality management techniques in the framework of collegiate accreditation. AQIP offers institutions of higher education a new, ‘continuous improvement’ method of maintaining accreditation.

Academic/instructional settings have proven to be the most difficult areas for implementation, while more success has been shown in administrative and auxiliary service settings. However, very little conclusive evidence appears to evaluate what has or has not been effective. Results in the literature recommended that successful implementation efforts must include: a diverse, cross-functional planning and implementation team; a broad commitment to the effort; a well-defined communication plan; and a willingness to have smaller, pilot implementations to build credibility and success.

Background information
Higher education provides a unique setting in which to study service quality. While administrative and auxiliary service areas of higher education often function in ways similar to typical
service businesses, academic/instructional areas are unlike the business world. The idea of shared governance, for example, makes institution-wide implementation of policies and practices more difficult. In addition, the concepts of academic freedom and tenure set apart the academic areas of higher education from typical service business operations.

Because each institution of higher education has a unique mission and organisational model, this paper focuses on broadly applied quality management techniques. As such, discussion focused on public institutions with undergraduate and graduate programmes, research programmes, and typical administrative and auxiliary functions (e.g. Registrar, Financial Aid, Residence Halls, Dining Facilities, etc.). Other institutions of higher education (for example, private schools and online-only institutions) will likely face both some similar and some different issues relating to quality; however, these are beyond the scope of this paper. For the purposes of this discussion of quality in higher education, higher education operations are described in three broad categories: education/instructional, administration and auxiliary.

To provide adequate background for this discussion, this section discusses two unique difficulties of quality efforts in higher education. First, difficulties in defining higher education’s ‘customer’ are discussed. Next, reasons are provided to explain why some in higher education are hesitant to use quality techniques from industry. Finally, recent motivations for quality efforts in higher education are discussed.

**Definition difficulties: who is the customer?**

The terms ‘service quality’ and ‘quality in education’ are difficult to define. Perceptions of service quality often differ based on the requirements of the service’s individual customer. In the educational setting, one customer might consider a certain class, curriculum, or university a high-quality educational experience while another might find the same experience mediocre. Karapetrovic and Willborn (1997, p. 287) defined quality of education as ‘the ability of student’s knowledge to satisfy stated requirements’ – those requirements being set by employers, accrediting bodies, professional societies, etc. However, the diverse product/service mix that a university provides to internal and external ‘customers’ requires a broader definition. (For an in-depth discussion of defining service quality and quality in higher education, see Karapetrovic & Willborn, 1997; Sahney et al., 2004.)

To further complicate the environment of quality in education, quality techniques from industry typically focus on customer requirements; however, the setting of higher education makes ‘focusing on the customer’ difficult. While the students of an institution of higher education are perhaps the most obvious customer, many other stakeholders also function as customers for the varying areas of operations (Table 1).

In addition to the competing customers above, different aspects of university operations serve different customers. For example, residence hall facilities cater almost exclusively to students (and to a more limited extent parents) as customers. Other stakeholders have little to no interest in or interaction with this portion of the university. Administrative areas of the university also have specific internal and external customers. For example, the university’s office of sponsored research serves internal faculty, staff and graduate student customers as well as external research sponsors and governmental agencies.

An examination of literature that describes quality efforts in higher education found that most authors agreed that the difficulty of defining higher education’s customer is a major barrier to quality improvement efforts. Helms and Key (1994) surveyed students at Wright State University to assess how students perceive their role at the university. Students strongly identified themselves as the customers in higher education and were hesitant to even acknowledge others as possible legitimate customer groups. Ewell (1993) described that faculty were...
hesitant to take seriously students as customers. Sahney et al. (2004) believed that global changes and competition are making education more like a product with students as its customers. Owlia and Aspinwall (1997) surveyed 124 people involved in educational quality efforts in the United States, Europe, India and Australia. The results identified students as the primary customer, followed by employers, society, faculty and families in descending order of relative importance.

To deal with the multiple customers in higher education, Ho and Wearn (1995) recommended that universities consider the relative importance of competing customers in order to balance quality improvement efforts. Pitman et al. (1996) stressed the importance of addressing the needs of all customer groups. Hwarng and Teo (2001) recommended Juran’s Triple Role concept to identify and clarify the roles of multiple customer groups.

Reavill (1998) outlined a product/process model where education of undergraduates is a process that produces a product: graduates. This model suggested that the customers of higher education are the future employers of the students. An alternative is the service/product model that assumes education is a service and the students are customers who wish to improve their level of education. Reavill rejected both models as too simplistic and suggested that a more robust and comprehensive model was needed and should be identified by asking who pays for and benefits from education (Reavill, 1998).

While many other organisations struggle with competing customer demands, other aspects of confusion further complicate the higher education setting. Ewell (1993) pointed out that in the instructional area, faculty most often view students as raw materials. Mazur (1996) also believed that instructors don’t view students as customers, rather as raw materials being developed into a product for the ultimate customers – industry and society.

Helms and Key (1994) noted that students could be classified as a raw material, customer, or even as employees. As a raw material, students move through a process and become the end product. As customers, students purchase the service of education. Helms and Key noted that students must be engaged in their studies, must be motivated to perform, and are evaluated – making them much like employees. In addition, quality of student performance is important to a university in the same way that quality of employee performance is important in the business setting. Further analysing the differing roles of students, Helms and Key (1994) pointed out that different educational settings provide different roles for students. In large,

| Table 1. Commonly recognised customers of a higher education institution. |
|---------------------------------|--------------------------------------------------------------------------------|
| **Group**                       | **Customer Attributes**                                                                                           |
| Students                        | Pay for service, receive educational instruction (service), utilise administrative functions, purchase auxiliary services (lodging, food, etc.). |
| Parents                         | Select (or assist in selection of) service provider, pay for service, can be primary points of contact during some service interactions. |
| Research Sponsors               | Provide funds in exchange for information, service, or activities. Often have contractual arrangement.              |
| State and Federal Governments   | Provide funds for university to engage in service. Exercise some influence over service/product design.               |
| Society                         | Benefit from the services provided, pay (through taxes) for portions of the service.                              |
| Future Employers of Students    | ‘Purchase’ the end product of the service process, sometimes provide funding and advise in service design.           |
| Disciplinary Academic           | Benefit from scholarly activity of faculty members.                                                              |
| Communities                     |                                                                                                                  |
| Accreditation Bodies            | Exercise control over product/service design.                                                                     |
| Staff/Faculty Members           | Control some of product/service design, consume some services.                                                     |

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introductory classes the students are very much like customers; however, in specialised graduate research settings students are more like employees.

**Resistance difficulties: using industry techniques in higher education**

Other work examined the differences between higher education and industry and how these differences affect cross-application of quality techniques. While industry quality techniques often suggest studying the market (the real needs of customers) and focusing quality to meet these needs, the motives of many academics are independent of the market (Owlia & Aspinwall, 1997). Ewell (1993) pointed out that the sceptical nature of the academy makes ‘fashionable’ industry quality techniques suspect. Ewell further elaborated that the concept of service to ‘anyone – whatever their label – directly threatens the academy’s core myth of independent inquiry, conducted on its own terms and for its own sake’ (Ewell, 1993, p. 54).

This difficulty is much more pronounced in the instructional areas of higher education than in auxiliary or administrative areas. Edler (2003, p. 2) noted that there is a ‘fundamental problem’ with applying corporate quality techniques to educational settings, specifically stating: ‘although educational institutions are corporate-like entities, the primary activity of these educational institutions is teaching and learning which is not itself a business activity.’ Unlike industry’s production and consumption of products or services, teaching and learning are different, and cannot be ‘torn apart into two halves: teaching on the one hand and learning on the other’ (Edler, 2003, p. 2).

**Motivation for recent quality efforts in higher education**

The literature suggests that higher education began its most recent focus on quality improvement efforts during the 1990s, owing to increased competition for students and operational funds. For example, Ewell (1993) suggested that the rise in TQM efforts in the 1990s was driven by the difficult financial situation in higher education in those years, rather than by any genuine effort to improve services. Hwarng and Teo (2001) pointed to increased competition for funding, resources, and students as motivators for an increased interest in quality in education. Owlia and Aspinwall (1997) stated that higher education is being driven towards industry-style competition because of changing economic conditions. Canic and McCarthy (2000) agreed, noting that during the 1990s students were becoming ‘more savvy’ and discriminating, state funding formulas were changing, and non-governmental funding sources were becoming more selective – leading to the increased focus on quality.

**Definition of quality techniques for consideration**

**TQM definition**

Ho and Wearn (1995, p. 25) defined TQM as ‘a way of managing to improve the effectiveness, efficiency, cohesiveness, flexibility, and competitiveness of a business as a whole.’ They further offered a list of principles required for successful TQM implementation, including leadership, commitment, total customer satisfaction, continuous improvement, total involvement, training and education, ownership of problems, reward and recognition, error prevention and teamwork (Ho & Wearn, 1995).

TQM seeks to continually improve core processes. As such, TQM requires attention to the proper definition of core processes and understanding exactly how each process is structured – often through flowcharting (Ewell, 1993) and other graphical representations, such as QFD.
Quality Function Deployment (QFD) definition
QFD is a method used to translate customer requirements and expectations into product or service attributes and quality (Sahney et al., 2004). The four-stage QFD process includes transferring:

- Customer requirements into product/service features;
- Product features into design requirements;
- Design requirements into process requirements; and
- Process requirements into processes/methods (Hwarng & Teo, 2001).

The QFD process determines and prioritises customer values so that the voice of the customer can direct the design of the product or service (Pitman et al., 1996). The QFD process involves a cross-functional team that works to define the customer, and the customer’s wants – the ‘whats’. Next, the team determines the ‘hows’ – the mechanisms to satisfy the customer’s wants. Finally, the team determines the relationships between these ‘whats’ and ‘hows’ and assigns value weights to each using a matrix known as a ‘house of quality’ (Pitman et al., 1996). Motwani et al. (1996) stressed that QFD requires: (1) a cross-functional team; (2) the QFD process itself, and; (3) the visual matrix that guides the process.

Six Sigma definition
Six Sigma is a systematic methodology for process improvement. Schroeder (2007) outlines the commonly accepted Six Sigma steps as:

- Define process;
- Measure quality variables valued by customer – set improvement goals;
- Analyse root causes of current defect levels – consider process change alternatives;
- Improve process – check and improve; and
- Control – monitor over time.

The Six Sigma process requires a trained quality improvement specialist, or ‘Black Belt’ to lead a cross-functional improvement team (Schroeder, 2007).

ISO 9001 definition
ISO 9001 is an international quality standard, administered through the International Organization for Standardization (ISO). ISO 9001 certifies a ‘process’ not a particular product or service (Schroeder, 2007). ISO provides a set of standards for process quality improvements that includes 20 elements, including attention to customer requirements; continuous improvement; adherence to applicable regulatory requirements; and management leadership (www.iso.org). This is one way for an organisation to be recognised for their quality management efforts. However, a more holistic approach is the Malcolm Baldrige National Quality Award.

Malcolm Baldrige National Quality Award definition
The National Institute of Standards and Technology’s Malcolm Baldrige National Quality Award recognises ‘best quality practice’ in the United States by analysing seven factors in process quality, performance improvement, and business results. Award criteria (listed at www.baldrige.nist.gov) include:

- Leadership – Examines how senior executives guide the organisation and how the organisation addresses its responsibilities to the public and practises good citizenship.
Strategic planning – Examines how the organisation sets strategic directions and how it determines key action plans.

Customer and market focus – Examines how the organisation determines requirements and expectations of customers and markets; builds relationships with customers; and acquires, satisfies and retains customers.

Measurement, analysis and knowledge management – Examines the management, effective use, analysis, and improvement of data and information to support key organisation processes and the organisation’s performance management system.

Human resource focus – Examines how the organisation enables its workforce to develop its full potential and how the workforce is aligned with the organisation’s objectives.

Process management – Examines aspects of how key production/delivery and support processes are designed, managed and improved.

Business results – Examines the organisation’s performance and improvement in its key business areas: customer satisfaction, financial and marketplace performance, human resources, supplier and partner performance, operational performance, and governance and social responsibility. The category also examines how the organisation performs relative to competitors.

Organisations must complete an extensive application and selection process before being named Baldrige National Quality Award Recipients. Awards are given in five categories (manufacturing, service, small business, education and health care). A maximum of two awards per category, per year are presented. The Baldrige Award category for educational institutions was added in 1999.

Academic Quality Improvement Program (AQIP) definition

Owlia and Aspinwall (1997) noted that traditionally ‘accreditation and assessment in universities focus(ed) on only inputs and outputs of the system...’ while ‘a TQM approach integrates and improves all the three stages – inputs, processes, and outputs’ (Owlia & Aspinwall, 1997, p. 527). In 1999, accreditation options for higher education changed with the introduction of the Academic Quality Improvement Program (AQIP).

AQIP’s goal is ‘to infuse the principles and benefits of continuous improvement into the culture of colleges and universities in order to assure and advance the quality of higher education’ (Handbook of Accreditation, 2003, p. 6.1-1). By studying related groups of processes, AQIP helps organisations to analyse, understand, and plan for improving these processes.

AQIP’s Handbook of Accreditation (2003) outlines a focus on the following groups of processes:

- Helping students learn,
- Accomplishing other distinctive objectives,
- Understanding students’ and other stakeholders’ needs,
- Valuing people,
- Leading and communicating,
- Supporting institutional operations,
- Measuring effectiveness,
- Planning continuous improvement, and
- Building collaborative relationships.

The key to knowing whether quality management approaches and techniques have been successful is through performance measurement of key operational and financial metrics.
Measuring service quality
In order for something to be quantifiably improved, it must be able to be measured. Higher education, like many service industries has struggled to measure service quality. Karapetrovic and Willborn (1997) suggested that units within higher education can, in consultation with their customers, define required ‘zero-defect’ objectives that can then be measured using techniques such as statistical process control. For example, at the departmental level, certain required skills and knowledge can be determined and then tested. Professional exams in some disciplines serve to meet this objective, although these exams are usually unrelated to any particular institution of higher education. Student performance is often not reported to the corresponding institution and is therefore unlikely to be helpful in quality efforts.

When performed within the institution, Karapetrovic and Willborn’s technique can provide some useful data on student performance; however, this method could prove difficult to implement in disciplines or sub-disciplines where ‘skills’ are subjective and difficult to measure.

The most widely used technique for measuring service quality (Sahney et al., 2004) is the SERVQUAL model. SERVQUAL, developed by Parasuraman et al. (1988), measures perceived service performance and compares it to customer expectations for the same service. Parasuraman et al. (1988) outlined several areas for measurement of quality perception, including:

- **Tangibles**: physical facilities, equipment and appearance of personnel;
- **Reliability**: ability to perform the promised service dependably and accurately;
- **Responsiveness**: willingness to help customers and provide prompt service;
- **Assurance**: knowledge and courtesy of employees and their ability to inspire trust and confidence; and
- **Empathy**: caring, individualised attention the firm provides its customers.

By measuring customer expectations and perceived performance, the SERVQUAL method identifies gaps that can be targeted for improvement.

Although some have suggested revisions or have criticised the SERVQUAL model (see Anderson, 1995; Grapentine, 1998–1999; Teas, 1993) it remains a valuable tool for service quality measurement.

Applications in higher education

Applications of TQM
The literature highlights TQM as the most widely used quality technique in higher education – perhaps because some working definitions of TQM are so broad that administrators lump any quality effort under the TQM umbrella (Sahney et al., 2004). Koch and Fisher (1998) reported that at least 160 universities in the United States reported TQM activities in 1996. Hwarng and Teo (2001) reported 146 universities and 66 community colleges involved in TQM efforts. One of the most famous TQM examples in higher education involved Arthur Taylor (a former president of CBS) implementing TQM campus-wide at Muhlenburg College in 1993 (Mihaly, 1995).

Despite the large number of institutions using TQM, surprisingly little has been published analysing implementation efforts (Koch & Fisher, 1998). Two TQM implementation efforts are highlighted here. The first (De Montfort University) is included for its report on the use of TQM in an academic/instructional setting – an application much rarer than in administrative or auxiliary areas. The second example (the University of Houston’s College of Business) describes the use of SERVQUAL to measure quality and has interesting results on the areas of quality that customers perceive are most important. For an example of TQM applied to administrative functions of a university see Montano and Utter (1999).
De Montfort University in the United Kingdom implemented TQM principles in both curriculum design and administrative functions. Newer models of education, such as ‘action learning’ were designed into the curriculum, and ‘teaching staff became 30% more efficient with double the number of students’ (Ho & Wearn, 1995, p. 29). The changes were controversial, but were supported by faculty. SERVQUAL was used to identify service gaps.

Based on their experiences at De Montfort University, Ho and Wearn (1995) propose the following strategic process to implement TQM in higher education:

1. Obtain top management commitment;
2. Establish a quality steering committee and implementation teams;
3. Assess the current quality system situation to identify all the existing good practices;
4. Create a documented implementation plan;
5. Provide training so that staff are fully aware of the changes;
6. Create and update quality management documentation; and
7. Monitor progress as part of the Deming cycle (plan, do, check, act).

The University of Houston College of Business used a SERVQUAL method of assessing service quality in administrative functions. Several interesting observations were made from this TQM implementation. Anderson (1995, p. 48) defined ‘technical quality’ as the actual quality of the service and ‘functional quality’ as the way that the service was delivered. Anderson (and others in the literature) noted that, customers evaluate mostly on functional quality – the way the service is delivered – rather than technical quality. This finding was used to help prioritise quality improvement efforts into areas that would show the most impact with customer perceptions.

The SERVQUAL improvement effort at the University of Houston showed that the instrument could be used to provide useful data on service gaps for improvement measures. When using SERVQUAL or similar instruments, it is important to note that simply reducing service gaps does not necessarily indicate higher quality service. If expectations are higher than perceptions, the gap can also be reduced if the customer’s expectations are lowered, even if service quality is perceived at the same level (Anderson, 1995). In fact, this effect was observed at the University of Houston – the longer a student was enrolled, the lower the student’s expectations (Anderson, 1995).

Although TQM is widely used, researchers differ as to its effectiveness. After a review of published higher education TQM results, Koch and Fisher (1998, p. 667) pointed out that ‘realistically, TQM in higher education appears to be a process for doing what we do better; but what we often need is to do something different.’

Difficulties in implementation include lack of inter-departmental trust and lack of confidence in administrators’ ability to manage the TQM process (Ho & Wearn, 1995). Ewell (1995) lists a primary difficulty as being the application of TQM’s desire to meet customer needs – particularly with respect to students as customers. One faculty member described attempts to please students as customers as ‘the inmates running the asylum’ (Ewell, 1993, p. 54). Ouwia and Aspinwall (1997, p. 541) noted that TQM efforts are difficult because of ‘individualism’ among academics, the difficulty of defining the customer, and the fact that academics aren’t motivated by ‘market issues’.

Much of the resistance to TQM in higher education focuses on the difficulties of students as customers, particularly in instructional settings. Faculty members, in particular, seem to be hesitant to consider student needs when developing higher education’s instructional product/service. However, the TQM concept of ‘leading’ the customer – helping to shape the customer’s desires, rather than simply reacting to them – seems to be a much more acceptable fit for the higher education setting (Ewell, 1993).
Koch and Fisher (1998, p. 662) were sceptical of higher education’s TQM efforts, stating ‘the empirical evidence in favor of TQM in universities is mostly anecdotal and surprisingly sparse . . . evidence that does exist relates primarily to administrative tasks such as bill collection, check writing, financial aid and registration.’ A literature review shows that even when TQM efforts are lauded as successful, no cost/benefit analysis is provided that would suggest the results were worth the effort (Koch & Fisher, 1998). Koch and Fisher go on to make three observations in summary about the observed results of TQM:

1. Results of TQM usually appear only after a large amount of employee effort;
2. The observed changes might also have been obtained by other, perhaps easier or less expensive methods; and
3. Very few instructional improvements have been shown as a result of TQM efforts – severely limiting TQM’s ability to have any significant impact upon higher education.

Applications of QFD

QFD has been used in a variety of different settings within higher education. Of the techniques studied, QFD was the technique most often applied in instructional settings, making it unique among quality initiatives. QFD has also been successfully used in higher education’s administrative quality efforts.

Mazur (1996) provided a brief history of QFD efforts in higher education, beginning with what is believed to be one of the first applications – the Mechanical Engineering Department at the University of Wisconsin-Madison in 1991. Mazur (1996) also described various other QFD implementations (mostly in academic/curriculum settings) both in the United States and abroad.

Pitman et al. (1996) reported that a pilot study using QFD to improve the MBA programme at Grand Valley State University in Michigan showed promising results. While the original researchers stressed that they believed the students are the customers of the MBA programme, several different ‘customers’ were used in the QFD process, including students, employers of students, and the academic community (via accreditation standards) (Motwani et al., 1996). The researchers reported that the cross-functional team required for QFD implementation helped to build broad support and commitment to the recommended changes (Pitman et al., 1996).

Mazur (1996) described the use of QFD to develop a senior-level TQM course at the University of Michigan. Both students (as internal customers) and industry representatives (as external customers) were surveyed to determine the voice of the customer. Mazur believed that QFD can be used to ‘improve all levels of university education activity, from degree programme design, to curriculum, to specific courses’ (Mazur, 1996, p. 5).

Hwarng and Teo (2001) proposed a method of QFD that modified the four-phase industry methodology into a three-phase, service-based methodology for higher education. Their proposed methodology includes:

- Phase I: Service Planning – Identify customer requirements and relate them to service elements;
- Phase II: Element Planning – Link the service elements from Phase I to process operations; and
- Phase III: Operations Planning – Link key process operations to service operations requirements.

The revised methodology was applied at the National University of Singapore to aid in instructional course design and delivery, review the online registration system, and update the
internal research application processes. Each area of implementation reported success; however, the authors cautioned that teamwork, dedication, and communication were just as important for success as the chosen methodology (Hwang & Teo, 2001).

Sahney et al. (2004) provided a very scientific application of QFD and SERQUAL in higher education. Their study examined statistically significant SERVQUAL and defined gaps in all aspects of business and engineering institutions in India. Results showed that the SERVQUAL and QFD approaches helped organisations to ‘understand the factors that the customer understands as constituting quality’ (Sahney et al., 2004, p. 162).

Applications of Six Sigma

While the Six Sigma methodology has seen broad acceptance in industry, little has been published about its use in higher education. Although some indicate that the methodology would be applicable to higher education (Raifsnider & Kurt, 2004) their approach is limited to a specific administrative setting. No examples of higher education implementation of Six Sigma efforts appear in the literature.

Institutions of higher education may be hesitant to attempt using Six Sigma methodology because implementation typically requires a full-time professional to lead the quality improvement team. In industry settings, these ‘Green Belt’ or ‘Black Belt’ certified leaders are often consultants who focus on corporate settings. Because of the concerns cited above (see the ‘Resistance difficulties: using industry techniques in higher education’ section) it would be difficult for these types of consultants to have credibility when entering the university setting, in particular when looking at improving academic/instructional areas. In addition, higher education settings are likely to be less lucrative consulting clients than for-profit corporations.

Applications of ISO 9001

The first university to achieve ISO 9001 certification was the University of Wolverhampton in the United Kingdom in 1994 (Storey, 1994). There are few other examples in the literature of institutions of higher education receiving ISO 9001 certification, particularly in the United States. An Internet search highlighted several certified universities in the United Kingdom and in the Philippines, as well as institutions in Sweden, Singapore, and Bangladesh.

Closer to the United States, Karapetrovic and Willborn (1999) examined implementation in an engineering department in a Canadian university. Within the United States, ISO 9001 certification is beginning to be applied in K-12 education with the goals of improving customer satisfaction and operational efficiency in the face of funding shortfalls (Miller, 2006). ISO certification at the K-12 level could filter up to US higher education, if it is shown to be beneficial.

Because ISO 9001 standards were developed primarily for manufacturing environments, they require modification for application in educational settings (Karapetrovic et al., 1998). Karapetrovic et al. (1998) provided a modified version of the process that groups ISO 9001’s 20 elements into a ‘quality loop’ and ‘supporting resource elements’ and provided examples of university processes covered in each element. Karapetrovic and Willborn (1999, p. 45) proposed a ‘holonic’ method for implementing ISO 9001 standards in higher education – where holons are ‘identifiable, autonomous elements of a system that have a unique identity’. This system outlined seven holons, including interface with the customer; design; acquisition of resources; deployment of resources; service delivery; service quality control; and service quality improvement (Karapetrovic & Willborn, 1999). Although each of these proposed methods makes the ISO standards more applicable to the higher education environment,
only a single example of implementation using these methods (see Karapetrovic & Willborn, 1999) is documented and no data about actual quality improvement are provided to support its implementation.

Walker (1997) described implementation of ISO 9001 standards on a university research laboratory in South Africa. This application was unique in that the university’s research area has significant interactions with industry, making ISO 9001 certification very relevant for its external clients. The author believes that being able to prove that the research group was committed to international standards of practice provided a valuable benefit in its interactions with industry.

Karapetrovic et al. (1998, p. 105) suggested that ISO certification would ‘provide confidence to employers, students, and the general public that their requirements for quality education and research are met …’. In industry, ISO certification is often driven by supply chain demands – with obvious financial implications. However, educational institutions (at least in the United States) do not face this same pressure from ‘customers’ to become certified, and there is little evidence at present to suggest that ISO certification represents any meaningful added assurance for the ‘customers’ of higher education. Walker (1997) admits that his research group’s certification has had ‘limited impact’ within his department and almost no impact beyond the department.

ISO 9001 certification requires a tremendous amount of effort. Karapetrovic and Willborn (1999) note that ISO 9007 is often criticised for having too many required procedures and too much required documentation. Storey (1994) and others at the University of Wolverhampton believed their ISO 9001 efforts were valuable, even though others questioned their decision to voluntarily take on the ISO 9001 process.

In the academic arena, the rewards of ISO 9001 certification are less obvious than the business and financial opportunities that can come with certification in industry. In higher education, rewards are found more in general process and systems improvement. Both certification pressures and rewards could increase as education becomes more international and ‘standards’ become more important. At present, ISO 9001 certification of higher education institutions is an area where no cost/benefit data are available to judge implementation value accurately.

Applications of the Malcolm Baldrige National Quality Award
Since the education category was added to the Malcolm Baldrige National Quality Award competition in 1999, only three institutions of higher education have won – the Kenneth W. Monfort College of Business at the University of Northern Colorado; Richland College, a community college in Dallas, Texas; and the University of Wisconsin-Stout (http://quality.nist.gov). Each college/university winner has used the award in marketing pieces, but no quantifiable information is available as to the impact of the award on quality. In the only available article found following up on a higher education Baldrige winner, Furst-Bowe and Wentz (2006) examined the University of Wisconsin-Stout and how the Baldrige award has affected operations in the five years since the award. Unfortunately, the article (authored by the University’s vice chancellor and its director of budget planning/analysis) provided only anecdotal evidence of success, and lists achievements such as ‘greater integration among faculty, staff, and students’ and ‘enhanced campus communication and teamwork’, which are difficult to quantify and link directly to the Baldrige award (Furst-Bowe & Wentz, 2006, p. 48).

The Baldrige award seems to carry more weight and marketing value in industry; however, as more institutions of higher education become involved in the competition, it will become more well-known in education and could become more valuable for marketing. While the Baldrige process itself likely helps institutions to focus on quality improvement, no data currently quantify its value.
Applications of the AQIP

Because AQIP has been designed for the higher education setting, it would be expected to be a good fit for implementation. To date, most discussion about AQIP comes from its sponsor, The Higher Learning Commission (HLC), a part of the North Central Association of Colleges and Schools (NCA). The HLC is – as would be expected – enthusiastic about AQIP’s prospects for success and value.

Edler (2003, p. 1) is more sceptical, claiming that with the AQIP model of accreditation ‘business values are rapidly replacing educational values at an unprecedented rate.’ Edler further elaborates that quality and efficiency goals often lead to a desire for standardisation – which is not always of value in higher education where open dialogue and disagreement are valued. Finally, Edler points out that in the AQIP process, there is no criterion for teaching – something that should certainly be considered in an educational setting (Edler, 2003).

While the AQIP method can be seen as promising for its desire to integrate continuous improvement into higher education accreditation efforts, it is too new to have shown any lasting changes or quantifiable results in the literature.

Summary of higher education quality efforts

Ho and Wearn (1995, p. 28) stated, ‘without total dedication from the top … the chances of effective promulgation of [TQM] concepts throughout the organisation are unlikely, and the necessary change to management and work attitudes would be difficult to achieve.’ However, in the setting of higher education, challenges like shared governance, faculty autonomy, and differing customer focuses across divisions and departments make a traditional ‘top-down’ approach to quality improvement difficult to achieve. In addition, Ewell (1993) believed that any technique used in industry will be met with scepticism in higher education. Management influence over academic areas is significantly less than in administrative and auxiliary areas. Even in the more business-like administrative and auxiliary areas, differing strategies and customers make university-wide quality improvement efforts difficult to implement and sustain.

Most quality efforts observed in higher education to date have focused on non-academic areas. In addition to being perceived as being an easier fit for industry quality methods, Canic and McCarthy (2000) suggested that focusing on non-academic areas first can be helpful to build a track record for success. Many efforts in academic areas have involved the business and engineering disciplines, areas that are more familiar – and presumably more comfortable – with quality techniques used in industry.

Karapetrovic and Willborn (1999) outlined detailed proposed steps for ISO 9001 implementation, including the use of a faculty ‘quality champion’; total management commitment; a diverse project committee; and thorough analysis and documentation. While their recommendations are specific to the ISO 9001 methodology and only verified in one university setting, it is worthwhile to note that their example successfully implemented ISO 9001 in an academic, rather than an administrative area.

Implementation efforts to date have yielded other important lessons, including the importance of recognising improvement efforts; good communication; not trying to get everyone on board – just a ‘critical mass’; selling the personal benefits of quality for each participant; and being ‘careful with the term customer’ (Canic & McCarthy, 2000). Karapetrovic et al. (1998, p. 107) suggested that faculty will be ‘weary of structured approaches requiring additional documentation’ and recommend implementing only quality systems that can be tied to specific benefits to each person involved.

Walker (1997) is disappointed with the impact of ISO 9001 quality efforts specifically, but the difficulties are similar to those encountered with other quality efforts. In particular, Walker
believed that faculty’s ‘high level skills in narrow domains … become barriers that restrict communication’ and that ‘the university environment can easily lead to intellectual arrogance and disdain of that which has to do with real-world engagement’ (Walker, 1997, p. 397).

While TQM remains the most widely referenced quality methodology reported in the literature, QFD is becoming increasingly popular in higher education. Cross-functional QFD teams help to build support for quality change, QFD offers a built-in mechanism for dealing with differing customer requirements, and a QFD has a specific methodology that moves the group to the ‘action’ point of proposing and implementing changes.

Institutions looking to improve quality must focus on achieving consensus about what customer voices will be used to focus improvements. For this reason, separate efforts may be needed in academic, administrative and auxiliary areas of the institution, where customers may differ. Techniques should also be used that allow for and prioritise different customer voices. While consensus and a ‘critical mass’ of support are needed, the results of current efforts suggest that ‘total buy-in’ will be difficult to achieve in higher education. A pilot effort to demonstrate success has worked in some instances as a way of building community support. Finally, strong internal communication and specific implementation plans presented by a cross-functional group have been shown to be helpful in moving from ideas to change.

Conclusion

This paper examined techniques for measuring and improving service quality in higher education. Six techniques were examined, Total Quality Management (TQM); Quality Function Deployment (QFD); Six Sigma; ISO 9001; the Malcolm Baldrige National Quality Award; and the Academic Quality Improvement Program (AQIP). TQM has been widely used and QFD is gaining in popularity. While the use of Six Sigma has not been reported in the literature, its use has been proposed for administrative areas. ISO 9001 certification is gaining popularity abroad and is beginning to be seen in K-12 education in the United States. Only three institutions have been awarded the Malcolm Baldrige National Quality Award to date and little evidence of its impact on quality is currently available. The AQIP is a relatively new method of higher education accreditation that utilises continuous quality improvement. While institutions are beginning to utilise AQIP for accreditation, little is known about its long-term impact.

Although many institutions have used a variety of techniques for quality improvement, similar obstacles must be overcome at each institution with each implementation. Customer definition, shared decision making, resistance to industry techniques, and resistance to change are primary difficulties.

Results in the literature show some claims of success; however, very little actual analysis has been provided to date that quantifies improvements and examines the costs and benefits of quality improvement efforts. Further efforts are needed to provide better data to justify the use of quality improvement techniques in higher education.

References
