

# **Designing Best Practices For Teaching and Learning Using A Quality Management System Framework; The ISO 9001:2000 Approaches**

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## **ABSTRACT**

The declining quality of graduates, increase competition and growing mandates for accountability by accreditation, statutory and funding bodies has forced higher education institutions (HEI) to focus on improving the quality of their services. In Malaysia, most HEIs choose to be certified with the ISO 9000:2000 in order to assure the public of the quality of their products. ISO 9000:2000 requires the organization to establish a quality management system to ensure that all activities and processes in teaching and learning meet the specified requirements consistently. It thus provides a framework for a HEI to direct and control all processes to ensure specified requirements set by statutory bodies, internal and external customers, stakeholders and prospective employers are met. The Faculty of Management and Human Resource Development (FPPSM) adapted the ISO 9001:2000 to design and execute its quality management system framework to ensure that it offers the best practices in its teaching and learning processes.

## **Introduction**

In many organizations, there is now a growing interest in the development of “quality systems” as a means of organizational change through the improvement of key processes. Many organizations are embracing the quality management philosophy and incorporating quality assurance standards as an integral part of their quality systems. Adoption of the quality system should also be seen as a strategic decision of an organization. Although quality management has its origin in the manufacturing industry, it is now more global in scope and permeates through all sectors of the economy including higher education institutions (HEIs). In fact, the Baldrige Award, the Deming Prize and the ISO 9000 standards can also be applied in an educational setting (Vandenberghe in Izadi, Kashef and Stadt, 1995).

In order to highlight the significance of adopting the ISO 9001:2000 quality management system framework in an HEI, this paper will discuss it in terms of designing best practices in the teaching and learning processes in the Faculty of Management and Human Resource Development (FPPSM), Universiti Teknologi Malaysia.

## **Implementation of ISO 9000 Quality System in Higher Education Institutions**

Declining quality of graduates, increasing competition and growing mandates for accountability by accreditation associations, legislatures, and funding bodies have “forced” higher education institutions (HEIs) to focus on quality. In Australia, a Senate inquiry have shown dramatic fall in the quality of teaching standards, student entry -level qualifications, campus conditions and quality of learning experience. The inquiry has also shown increases in problems such as student plagiarism, grade inflation and ‘soft’ marking (Smart, Sim & McMahon, 2001).

The effectiveness of the quality concept in the other sectors gave the momentum for higher education institutions to adapt this concept and practice it in their own domain (Kanji et. al, 1999). The successful acceptance and implementation of quality system into higher education is often assisted by externalities such as conducive government regulations, economic conditions, confident leaderships and a certain level of stress to initiate a need for change (Idrus, 2001)

The ISO 9000 quality system provides a framework to establish a quality system in teaching and learning in HEIs. The ISO 9000 Quality System is basically a model that provides a unique framework for any organization to establish a customer oriented quality system that is internationally recognized and can be independently assessed and certified. In the United Kingdom, the first university to implement and obtain ISO 9000 certification for its full scope of activities was Wolverhampton University. The University’s initial adoption of the TQM approach to quality produced high expectation but had very little to show at the end of the day because of the lack of focus (Doherty in Subramaniam, 1988). It switched to the ISO 9000 quality system mainly because it was felt that an independently certified quality system would put it in a better market position as compared with its competitors. It felt that the discipline of writing the quality manual, identifying procedures and writing work instructions would provide a much better grasp of the University’s internal processes, and internal and external customer or stakeholder links. The Quality Management System was intended to form the base for a TQM culture of continuous improvement across the university. Kanji (1998 in Kanji, 1999) says that ISO 9000 could be integrated with TQM for the development of a total quality system where quality improvement can be achieved by examining the organisation’s processes in terms of process definition, process improvement and process design.

In Malaysia, the initiative to implement ISO 9000 quality system in public HEIs was undertaken with the introduction of the Development and Administration Circular by the Malaysian Government in 1996. According to this circular, all government agencies including public HEIs, should implement MS ISO 9000 quality system to ensure the delivery of quality services to customers. Among the public HEIs that are already certified to ISO 9000 are Universiti Teknologi Malaysia, Universiti Utara Malaysia, Universiti Putra Malaysia, Universiti Pendidikan Sultan Idris, Universiti Sains Malaysia,

and Universiti Teknologi Mara. Most of these institutions have adopted the 1994 version of ISO 9000 and are now in the process of up-grading the system to ISO 9001:2000.

Faculty of Management and Human Resource Development (FPPSM), Universiti Teknologi Malaysia (UTM), was given the task to pioneer the move and be ISO certified in its core business of teaching and learning. The system and procedures that lead to the success in adopting the system at the Faculty would be used as the main template for all the teaching-learning processes at UTM. To date, there are four faculties and four departments that have been certified to ISO 9000.

ISO 9000 version 1994, however is considered as lacking in customer-orientation (Idrus, 2001) and placed too much emphasis on documentation (Robert, 1997). The 1994 version consisting of the 20-element model was bias towards manufacturing organizations and the increased use of the standard especially by the service sector requires subsequent and substantial changes to the standard. As mentioned before there are a few public HEIs in Malaysia which have been certified with the ISO 9000 version 1994. However several weaknesses were observed, which includes the following:

The ISO 9000 quality systems developed were not for core businesses of the institutions.

No standardized and common quality assurance standards and procedures were available which can be applied in the public higher learning institutions quality system and the key performance indicators to assess the result of the application of such standards and procedures.

Most ISO 9000 quality systems were developed for Faculties and Departments, not for the whole University.

Many ISO 9000 quality systems were developed in an institution with less emphasis on the coordination and integration among the systems.

Too much documentation were required.

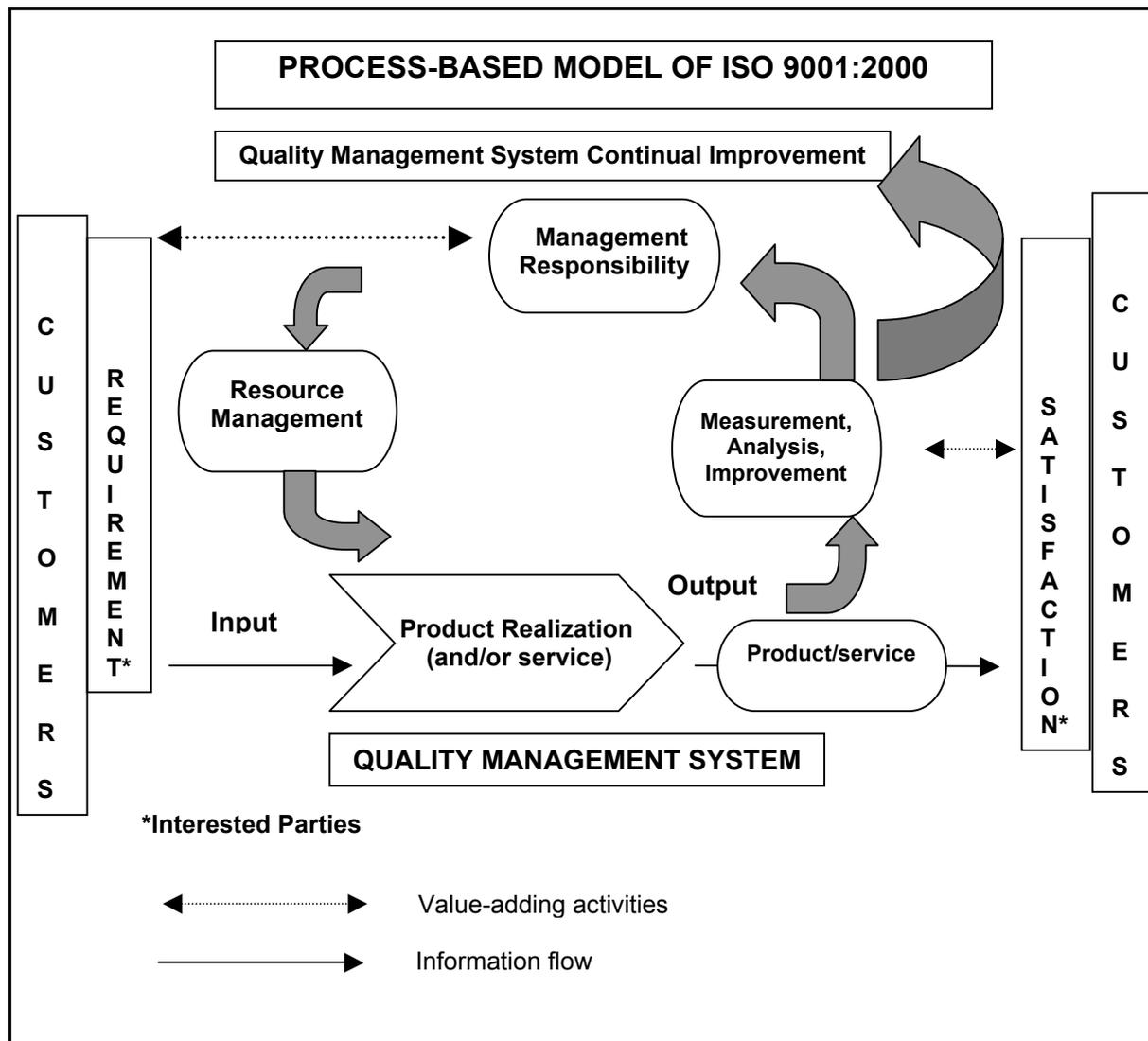
The problem with the 20 elements of ISO 9000 and its current bias towards manufacturing organizations.

Too much focus on securing the ISO 9000 lead to the setting up of standards that may not be of credible quality.

However, the latest ISO 9000 series that is ISO 9001 Version 2000 that was introduced in October 2000 is more generic and flexible in nature, and has both customer requirements and customer satisfaction as an integral part of the standards (Idrus, 2001). The ISO 9001:2000 focuses on designing and establishing a quality management system aims at meeting and enhancing the requirements of the customers, organizations and other interested parties.

The ISO 9001:2000 quality management system can also be regarded as one of the approach as towards achieving best practices in teaching and learning. ISO 9001:2000 system not only focuses on quality assurance, but on the design of a quality management system. This leads to the achievement of customers satisfaction through incorporating their requirements in the system and measuring whether or not their satisfaction is achieved continuously. Thus, adopting this system will ensure the teaching and learning processes are of creditable standards and quality. This paper thus, discusses how best practices in teaching and learning at FPPSM, in particular, and UTM, in general, were designed and practiced using the ISO 9001:2000 quality management system framework.

ISO 9001:2000 Quality Management System The ISO 9001:2000 quality management system is a 'process model' with the integration of four major components as shown in Figure 1.



**FIGURE 1: PROCESS-BASED MODEL OF ISO 9001:2000**

This model emphasizes on the following:-

- the importance of identifying and understanding the needs and expectations of customers as well as other parties to ensure that their requirements are being met.
- the commitment of top management to support the implementation of the quality management system and to continuously improve the system
- the effective utilization of organizational resources in implementing the quality management system
- the control of the product and/or service realization process to ensure all requirements are being met consistently
- the measurements of quality management system processes to determine the effectiveness of the system and improvement opportunities.

Specifically, the ISO 9001:2000 quality management system major clauses and requirements are explained in Table 1.

**Table 1: ISO 9001:2000 Major Clauses**

The major clauses	Requirements
Management Responsibility	The top management of an organization must demonstrate its commitment to the establishment and implementation of the quality management system and to continuously improve the effectiveness and efficiency of the system.
Resource Management	Resources including human resource, financial, equipment, utilities, hardware and software must be determined and provided to ensure conformity of product/service and quality management system to specified requirements.
Product and/or service realization	Product and/or service realization is the process that will convert the customer requirements into an output that is both acceptable to the customer and one that would not jeopardize the quality. Output refers to the product and/or service that is a result of product realization and one that fulfills the customer requirements.
Measurement, analysis and improvements	At each step along the way, some form of measurement or analysis has to be conducted to measure the process, product and customer satisfaction. Once data on process, product and level of customer satisfaction is gathered, an analysis needs to be done to determine whether any correction and corrective action has to be taken or not. If there is no cause for this to take place, the emphasis will be on the need to carry out continual improvement to ensure the high standard is maintained.

**Designing Best Practices for Teaching and Learning Using ISO 9001:2000**

In designing and establishing a quality management system, the mission of an organization is an important input and must be incorporated in the system. According to Quigley (1993) mission or purpose can be described as what an organization is today and what it aspires to become in the future. It provides a general direction and a means for achieving the aspired future. Goodstein, Nolan and Pfeifer (1993) refer the concept of mission as one expression of why an organization exists and why it competes in certain sectors or industries and not in others. Therefore, mission involves a clear statement of what business the organization is in and what the organization is attempting to achieve in the industry. ISO 9001:2000 clause 5.3 specifically requires an organization to establish a quality policy that is consistent with the purpose or mission of the organization. The formulation of quality objectives that are measurable and consistent with the quality policy is a requirement of clause 5.4.1.

An organization requires **management systems** to control and utilize its resources towards fulfilling its mission and goals. A management system of an organization can include different management systems, such as a quality management system, a financial management system or an environmental management system (MS ISO 9000:2000). The establishment of the systems will ensure organizational operation and resources are mobilized towards achieving organizational mission and goals. Any corrective actions can also be taken with the implementation of the management systems.

**A quality management system** is required to direct and control an organization with regard to quality (MS ISO 9000:2000). The establishment of a quality management system focuses on the achievement of results, in relation to quality objectives, to satisfy needs, expectations and requirements of customers and other interested parties. In addition, the development of a quality management system should serve as a means to achieve organizational mission.

Two essential components of a quality management system are quality assurance and quality control. Quality assurance is part of quality management focusing on providing confidence that quality requirements will be fulfilled. Quality control is part of quality management focusing on fulfilling quality requirements (MS ISO 9000:2000).

A mission will inspire an organization to achieve what it wants to become in the future. A quality management system is required to direct and control an organization with regard to quality as a means to achieve organizational mission. **Audits** are crucial to determine whether or not the organization quality management system is effectively implemented and whether it is able to achieve the organizational mission. An audit is a systematic, independent and documented process for obtaining audit evidence and evaluating processes objectively. This is in order to determine the extent to which audit criteria are fulfilled (MS ISO 9000:2000). Audit evidence includes verifiable records, statements of fact or other information, these are relevant to the audit criteria that can include policies, procedures or requirements used as reference when conducting audits. An organization can implement audits and use the audit findings to ensure not only compliance to quality assurance standards and procedures, but also more importantly to determine the effectiveness of the quality management system in relation to its contributions towards the attainment of the organizational mission. In fact, audit results form a key input in determining where opportunities lie for continual improvement (Cianfrani, Tsiakals and West, 2000).

**Continual improvement** refers to recurring activities that increase the ability to fulfill requirements (Cianfrani, et al., 2000). This is the key requirement for sustaining the organizational journey towards achieving the aspired future state. Continual improvement is also one of the eight quality management principles of ISO 9001:2000 and it should be a permanent objective of an organization to continuously enhance the organization's overall performance.

Based on the above discussion, essential elements that should be considered by higher education institutions when designing best practices in teaching and learning are:

the integration of mission statement with quality management system processes to provide a sense of purpose in offering courses that meet the requirements of customers' and all interested parties'.

the establishment of a quality management system including quality control and quality assurance to assure that all activities and processes in teaching and learning meet the specified requirements consistently.

the implementation of continuous quality audit to provide evidence that the teaching and learning processes are effectively implemented; and

Continuous improvement efforts to enhance customers' and organizational stakeholders' satisfaction.

### **Designing a Mission-based Quality Management System for Teaching and Learning**

Mission statement reflects an organization's future direction to be achieved. A mission provides a sense of purpose for the entire organization (Goodstein, et al. 1993). In order to achieve the mission, it must be translated into organizational day-to-day activities and incorporated in a management system. Freeman (1993) and Dalela and Saurabh (1997) suggest that one essential element that should be incorporated when designing a quality assurance or a quality system is a mission statement. Therefore, a mission-based quality system must be considered by educational institutions when designing and implementing a quality management system for teaching and learning.

FPPSM's mission reads as **“to produce competent graduates capable of managing technology and answerable to the society”**. Towards the realization of the mission, FPPSM has formulated long-term and short-term plans and established goals and objectives to be attained by 2010. The goals and objectives of the Faculty are then translated into FPPSM's quality policy and quality objectives. The formulations of quality objectives are consistent with the mission and quality policy as required by MS ISO 9001:2000; Quality Management System – requirements: Clause 5.4.1. This reflects FPPSM's effort and commitment to develop a mission-based quality management system.

### **The Establishment of a Quality Management System for Teaching and Learning**

The best practices in teaching and learning should be customer-driven and process focused. In education, two categories of customers are identified. One is the Internal Customers (students) who receive the services provided by a faculty. The other is the External Customers that includes the industries and government agencies which employ the graduates. Quentin (2000) referred to this customer as beneficiary of education.

Designing best practices in teaching and learning using ISO 9001:2000 quality management system framework requires an education institution to carefully determine external customers' requirements (as well as other interested parties requirements) and to translate those requirements in the academic curriculum. Subsequently, all teaching and learning activities including evaluation and assessment methods, modules and class delivery must be focused on meeting the specified requirements. Any changes in the requirements of customers must be continuously monitored and adjustments be made to curriculum and other teaching activities accordingly. This is referred as customer-driven or beneficiaries-driven teaching and learning.

As one of the measurements of the performance of the teaching and learning, an education institution should monitor information relating to customer perception as to whether the institution has met customer requirements. This is in fact a mandatory requirement of ISO 9001:2000 as stipulated in Clause 8.2.1. Responding to this, FPPSM constantly conduct studies to measure external customer satisfaction with regard to the quality of its graduates in term of knowledge and skills in the respective field of study, leadership quality, communicative ability and cooperation with colleagues (Norfadzillah, 1997). In addition, customers' opinions are gathered through reports from external supervisors on students who undergo practical training; needs analysis carried out during the design state of the course/curriculum and questionnaires distributed by UTM's ALUMNI to the present employers of the graduates. Any suggestions and complaints by the customers were considered, assessed and wherever necessary, incorporated into the teaching and learning process. Only with such objective assessment of such feedback could the Faculty adhere to the principles of best practices and hence, practices continuous improvement.

Best practices in teaching and learning should also be process-focus. Process approach is one importance quality management principle of ISO 9001:2000. The process-focus regards students as internal customers as they are the ones who receive output of the teaching and learning process. The output of teaching and learning process includes teaching materials, modules, class delivery, project papers and other academic related services. These outputs must meet quality standards and must be consistent with the curriculum designed. This approach is consistent with ISO 9001:2000 which clearly focuses on controlling the processes of a quality management system and output of those processes.

Although students are regarded internal customers, they cannot specify to the institution how the course should be run or how assessment should take place. In this context, Quentin (2000) preferred to address students as recipients because they do not set education specification.

Even though internal customers or students or recipients cannot set education specification or curriculum, it is very important that a faculty encourage them to express their opinion or suggestions. For this purpose, at FPPSM, each semester the students are asked to respond to a set of questionnaire that aims to solicit information concerning the following:

**Lecturer's preparation:** sufficient teaching & learning materials, continuance, organization, teaching aids.

**Lecturer's delivery:** variety of teaching and learning techniques, confident, interesting

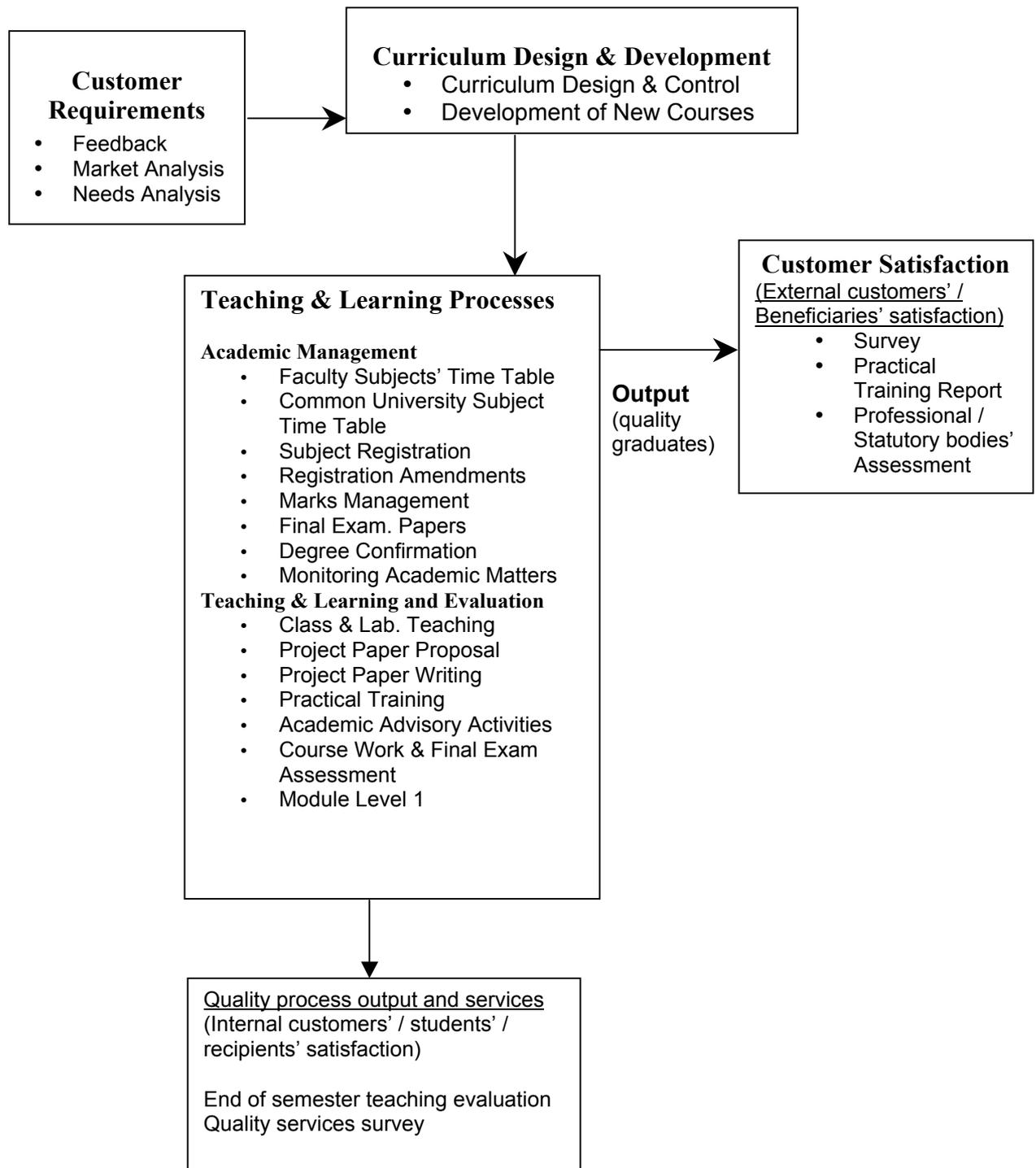
**Lecturer's evaluation method:** organized assessment, students are made aware of mode of assessment and assessment wholly based on lectures.

**Teaching organization:** Course outline distributed during first week, keep to schedule, on time, delivers lectures.

**Lecturer- student relationship:** available, lecturer willing to listen to students' suggestions, open minded, good rapport.

Information regarding lecturer's performance based on the above questionnaire was then used to identify further improvement in the delivery of teaching and learning activities. Such improvements include identification of training needs and teaching aid equipment to enhance the teaching and learning process.

Figure 2 summarizes the customer-driven (beneficiaries) and process-focus (recipient) conceptual model that has been used by FPPSM in designing best practices in teaching and learning.



**Figure 2: FPPSM's Customer- Driven (Beneficiaries) and Internal Customer (Process Focus) Model of Quality Management System for Best Practices in Teaching and Learning**

The FPPSM's model of best practices in teaching and learning is further elaborated below.

**Customer requirements:** This component refers to external customer requirements (and other interested parties requirements including statutory and regulatory procedures that the Faculty has to comply with). The external customers encompass industries, government agencies, and other related agencies who will employ the graduates; and professional and statutory bodies. Feedback, market analysis and needs analysis are the tools used to objectively identify the requirements of the customers.

**Input:** The requirements stipulated by the respective and varied external customers serve as integral input to best practices and must be translated into the curriculum design.

**Curriculum design:** Designing an academic curriculum that reflects the knowledge, skills, attitude, and so on, that the external customers want. The curriculum design must be up-dated and modified in line with the demands and the development of the customers.

**Teaching and learning process:** In ISO 9001:2000, this process is referred to as product and/or service realization. To establish best practices in teaching, the focus is given to the 3 Ps – People, Process and Product. The focus on people stresses on encouraging creativity in the classroom environment in addition to creating competency in the respective area or field of expertise of the lecturers. The process involves the teaching and learning activities in producing quality graduates. On the other hand, focusing on product will ensure graduates of FPPSM meet requirements of external customers, as identified in the early stage.

**Quality process output and services :** This component of best practices refers to process output (eg. Examination papers, teaching modules, course work materials) and services (delivery of lectures, registration of subjects, marks management) given to the students. All process outputs and services must meet quality standards stipulated in the quality management system documents, customers charter and quality objectives.

**Output:** This is the ultimate product or result of teaching and learning; the quality graduates that meet external customers' requirements in terms of knowledge, skills, attitude, and other relevant qualities.

**Customer satisfaction:** As a measure of the effectiveness of the teaching and learning process and the entire quality management system, surveys, assessment by professional and statutory bodies and practical training reports are gathered regularly.

### **Quality Management System Audit**

Audits are used to determine the extent to which the quality management system requirements are fulfilled whilst audit findings are used to assess the effectiveness of the quality management system and to identify opportunities for improvement (MS ISO 9000:2000; Quality Management System). The implementation of audit is a requirement of ISO 9001:2000 as specified in Clause 8.2.2.

In ISO 9001:2000, audits can be performed as follows:

First-party audits or internal audits which are conducted by, or on behalf of, the organization itself for internal purposes and can form the basis for an organization's self-declaration of conformity.

Second-party audits are conducted by customers of the organization or by other persons on behalf of the customer.

Third-party audits conducted by external independent organizations which provide certification or registration of conformity with requirements such as those of MS ISO 9001:2000.

For teaching and learning at FPPSM, audits are conducted at two different levels, namely internal audit and third-party audit. The internal audits, are performed by internal auditors (FPPSM staff) who are independent from the area or process being audited. These audits are conducted at least once a year and cover all teaching and learning activities. To date, FPPSM has conducted three internal quality audits and two third-party audits since 2000. These were done to ensure continuous best practices in teaching and learning.

In auditing processes the audit findings are important because the findings demonstrate compliance of FPPSM's quality management system to quality assurance standards, service standards and the effectiveness of the system in meeting customers' and all interested parties' requirements. At the same time, results of the audits also indicated nonconformities in teaching and learning processes that need immediate corrective actions. Some areas were also highlighted in the findings for further improvement in the teaching and learning processes.

From FPPSM's experience, auditing the quality management system is regarded as crucial in order to check the compliance of teaching and learning activities to quality assurance standards and customers' requirements. Findings of audits then can be used to continuously improve the effectiveness of the system. Thus, best practices in teaching and learning must include audits as an efficient method to demonstrate the effectiveness of the teaching and learning processes and areas for improvement.

### **Continual Improvement of the Quality Management System**

The aim of continual improvement of ISO 9001:2000 quality management system is to increase the probability of enhancing the satisfaction of customers and other interested parties. This can be achieved through:

the implementation of correction measures to eliminate a detected nonconformity and corrective action to eliminate the cause of a detected nonconformity or other undesirable situation in order to prevent recurrence.

the execution of preventive action to eliminate the cause of a potential nonconformity or other undesirable potential situation.

the improvement of quality management system processes by reviewing the quality policy and objectives, quality assurance standard, adding value to products and services to customers and the setting-up of higher organizational targets.

In the context of teaching and learning at FPPSM, improvements were focus on the following 3P's: Product, Process and People:

Product which covers enhancing quality of graduates and improving process products, which involves the quality of examination papers, the undergraduate projects, course work materials and practical training.

Process which involves improvement in the teaching and learning activities in producing quality graduates. Such improvement includes the introduction of new ways of class delivery, the enhancement of students' evaluation methods, the adjustment of course curriculum to match changes in the needs and requirements of customers and professional bodies.

People which involves effort to increase staff competency in delivering academic courses and management of academic related activities and processes.

Such improvements were carried out through taking corrective and preventive actions based on the audit findings, feedback from customers and other interested parties, data regarding the achievement of quality objectives and suggestions from faculty staff.

### **Conclusion**

The paper has considered ISO 9001:2000 quality management system as a framework for a HEI to design and implement best practices in teaching and learning. The focus of designing best practices in teaching and learning process using ISO 9001:2000 should entail:

the incorporation of organizational mission and strategic goals into the educational quality management system;

the establishment of a quality management system as a framework to direct and control all processes in teaching and learning to ensure specified requirements are met on a consistent basis;

the implementation of continuous audits to determine the effectiveness of the teaching and learning process and the quality management system whilst audit findings are used to identify opportunities for improvement; and

the implementation of continuous improvement to enhance the satisfaction of customers and other interested parties as well as to continuously increase organizational capabilities in providing and delivering academic courses.

Adopting best practices in teaching and learning in higher education institutions using ISO 9001:2000 will ensure that all academic standards are fulfilled; efficient teaching and learning activities through measurement as practiced, analysis and improvement activities at each step of the quality management system are undertaken; customers' satisfaction by continuously meeting their requirements are enhanced; and institutional effectiveness and improvement effort through internal and external audits are determined. In the context of Malaysia, the intention to introduce quality assurance standards and procedures for public HEIs by the Ministry of Education, similar to the Quality Assurance Agency in the United Kingdom and the Unified Higher Education System in Australia, will certainly enhance the institutions ISO 9000 quality management system adherence to a common and high education standards in delivering academic courses. In continuing the quality journey and ensuring quality of the highest creditable and standards, higher education institutions should continuously improve their teaching and learning effectiveness and efficiency by embarking on benchmarking projects with renowned education institutions to ensure it is of a world class standard.

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