

## **Implementation Of Efqm Model In A Greek Engineering Higher Education Institute: A Framework And A Case Study**

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**Abstract:** *One of the most effective strategies evolved over the years that have been successfully used by business organizations is total quality management (TQM). TQM is a systems approach to management that aims to enhance value to customer by designing and continually improving organizational processes and systems. In Europe, the EFQM Excellence Model is one of the most widely used organizational TQM frameworks and is based on nine criteria. TQM principles incorporated into the EFQM model are well established in private sector organization but not in education; only a small number of universities, mainly in U.K. have formally adopted the EFQM model as basis for self-assessment. The gap in relative research publications suggest that further research is require on the adaptation of TQM principles and of the EFQM model in the context of Higher Education.*

*The present paper discusses the adaptation of EFQM model in a Department of a Greek Higher Education Institute (HEI). The nine criteria (enablers and results) were modified in order to reflect the unique characteristics of a HEI (student as a customer, teaching and learning, etc). This process is accordance with recent Greek legislation (Law 3374/2005) and European initiatives for a European Higher Education Area (Bologna process and Bergen report). The implementation of this framework is, in general, successful. Based on this framework and on external audit by a UK university, a joint post-graduate program was agreed.*

**Keywords:** *quality models, quality in education, EFQM model, Greek Higher Education Institute.*

### **1. INTRODUCTION**

A core component of higher education reform is systematic quality assurance and improvement of Higher Education institutions (HEIs). The "Communiqué of the Conference of Ministers Responsible for Higher Education in Berlin on 19 September 2003" establishes

that the quality of Higher Education has "proven to be at the heart of the setting up of a European Higher Education Area". Assuring quality in teaching and learning is no longer a matter only for Higher Education policy programs or broad international professional discussion. Quality development and assurance have long since come to play a central role in

strategic Higher Education planning and in the everyday work of HEIs.

Systematic procedures for quality assurance and improvement through evaluation have been in place in Western Europe since the mid 1980s. France took up evaluation of Universities (institutional evaluation) in 1984; Finland did so in the early 1990s. The evaluation of programs of study was introduced in the Netherlands, the United Kingdom and Denmark in the late 1980s/early 1990s and in Germany in the mid 1990s. For stocktaking of national evaluation systems, analysis of commonalities and differences and the development of common evaluation models, researchers on Higher Education have conducted a number of studies since the mid 1990s in Europe and beyond; for an overview see [1, 2].

In 1993, with a seminar published in the "Higher Education" Journal (publisher: Springer Netherlands), the concept of Total Quality Management (TQM) in Higher Education was introduced. The special issue (25/2) of the journal included 8 articles describing the introduction/implementation of TQM principles in higher education institutions (HEIs); see for example [3, 4].

TQM is one of the most effective strategies, evolved over the years, that have been successfully used by business organizations is total quality. TQM is a systems approach to management that aims to enhance value to customer by designing and continually improving organizational processes

## **2. QUALITY AND TQM IN HIGHER EDUCATION**

### **2.1. Definitions of Quality and TQM**

In quality management, it is vital to study the meaning of quality in the situation that is under study. In the area of Higher Education, the concept of what constitutes quality has not been thoroughly addressed, although some interesting studies exist; see for an overview [5, 6] Further, there is the vast field of general research into quality management in services. The extent to which this research is applicable to the sector of higher education also remains to be analyzed.

There are various well-known definitions

and systems.

In Europe, the EFQM Excellence Model is one of the most widely used organizational TQM frameworks and is based on nine criteria. Five of these are "Enablers" and four are "Results". The "Enablers" criteria cover what an organization does. The "Results" criteria cover what an organization achieves. "Results" are caused by "Enablers" and feedback from "Results" help to improve "Enablers".

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The present paper discusses the adaptation of EFQM model in a Department of a Greek Higher Education Institute (HEI). The nine criteria (enablers and results) were modified in order to reflect the unique characteristics of a HEI (student as a customer, teaching and learning, etc). This process is in accordance with recent Greek legislation (Law 3374/2005) and European initiatives for a European Higher Education Area (Bologna process and Bergen report). The implementation of this framework is, in general, successful. Based on this framework and on external assessment by a UK University, a joint post-graduate program was agreed.

of quality. Crosby (1979) defines quality as "conformance to requirement" while Juran and Gryna (1980) define quality as "fitness for use". Deming's (1986) definition of quality as "a predictable degree of uniformity and dependability at low cost and suited to the market" is more towards quality in operation. Many organizations found that the old definition of quality, "the degree of conformance to a standard", was too narrow and consequently have started to use a new definition of quality in terms of "customer focus".

As far as TQM is concerned, there are a number of researchers who have formulated frameworks for quality improvements; it is not the scope of the present paper to critically present them. In general, it is agreed that TQM describes two main notions - continuous

improvement and the tools and techniques/methods used. In general, TQM encompasses many management and business philosophies and its focus gets shifted based on the scenario where TQM is applied. Whether it is in Industry or Higher Education, TQM philosophy revolves around the customer; see [6].

## 2.2. Quality and TQM in HIE

Quality in Higher Education is even more difficult to define than in most other sectors. Frazer [7] argues that a first important step would be to agree internationally on terms such as levels, standards, effectiveness and efficiency. Such agreement on basic factors is also an objective for the so-called “Bologna process” of integration currently taking place in Europe. Discussing quality in Higher Education, Harvey and Green [8] proposed five discrete but interrelated ways of thinking about quality:

- (1) Quality as exceptional. Quality is regarded in terms of excellence, which means something special or exceptional. High standards are exceeded.
- (2) Quality as perfection or consistency. The focus is on processes and specifications that are aimed to be perfectly met. Excellence, in this case, means “zero defects”, i.e. perfection.
- (3) Quality as fitness for purpose. Quality has meaning only in relation to the purpose of the product. In traditional quality management, the “fitness for purpose” notion is related to the customers; an idea originated by Juran. In higher education, however, a number of researchers [8-10], see the view of quality as “meeting customer requirements” as problematic due to the contentiousness of the notion of “customer” and the difficulty for, e.g. students to specify what is required.
- (4) Quality as value for money. Quality is equated with levels of specifications and is directly related to costs.
- (5) Quality as transformation. The process should ideally bring about a qualitative change, a fundamental change of form such as the phase transition when water transforms into ice as the temperature is lowered. This view can be found in the thinking of major Western philosophers as well as in Eastern philosophies. In

education, the transformation can take the form of enhancement and empowerment.

As far as TQM is concerned, introduction of TQM in HIE follows similar routes with the ones found in Industry; i.e. increasing global competition, increasing costs, demands for accountability and rising “customer” expectations about quality. Owlia and Aspinwall [11], in their survey, have indicated that economic and legislative forces are pushing Higher Education into a new environment and in such an environment, adopting TQM is a “natural” phenomenon. In Higher Education, TQM is considered as a process-oriented approach to increasing productivity, decreasing costs and improving quality of service. From the theories of TQM, it is evident that it stresses teamwork, finding better ways to do things, sharing responsibility and dramatically improving institutional cultures, all of which fall well in line with the value set of many modern HEIs and their faculties.

## 2.3. EFQM model and its modification for HEI

In our competitive world, Higher Education institutions face the challenge of providing quality education under tight budgetary constraints. Hence, they have started to believe in preparing the students for a future of dynamic change, with relevant knowledge and life-long skills. In this context, the principles of TQM fit well as they instill a thirst for continuous improvement, such as, self-improvement, work improvement and improving community and society.

The first step towards implementing TQM in a higher education setting should be to adopt a relevant TQM framework that meets its mission and objectives. The TQM framework should be built upon a set of core values and concepts. These values and concepts provide the foundation for integrating the key performance requirements within the quality framework. A set of fundamental core values forming the building blocks of a possible TQM framework is listed as follows:

- leadership and quality culture;
- continuous improvement and innovation in educational processes;
- employee participation and development;

- fast response and management of information;
- customer-driven quality; and
- partnership development, internally and externally.

In Europe, the EFQM Excellence Model is one of the most widely used organizational TQM frameworks and is based on nine criteria. The EFQM Excellence Model has been developed by the European Foundation for Quality Management (EFQM). Developed initially as a model to underpin the European Quality Awards, the EFQM Excellence Model is widely used across Europe as both a tool for organizational self-assessment and as a tool for strategic integration. The evidence shows the methodology can be applied to any type of organization, private sector and public sector, large and small. Whilst the Model is in use in most parts of the public sector, it has relatively little application in Higher Education.

The EFQM approach to Total Quality Management is crystallized in the EFQM Excellence Model. Whilst focusing on achieving business or organizational results, the EFQM Model covers all the different areas of strategic management. A description of the EFQM Excellence Model for Criteria and Sub-Criteria is omitted due to restriction in space; relative information could be found at EFQM web site ([www.efqm.org](http://www.efqm.org)).

- The EFQM Excellence Model can be applied to any level in an organisation. Therefore, in a HEI, it can be applied to the whole institution or to a Faculty,

School or infrastructure department such as human resources or facilities management. The outputs of a self-assessment process are typically:

- A definition of strengths and areas for improvement against each sub-criterion of the Model
- A set of prioritised actions that can be integrated into the business planning process
- An identification of gaps in terms of approaches or measures that can provide opportunities for benchmarking
- A score for each sub-criterion and criterion
- An overall score.

Taking into account the differences between industry and education, legislative forces and European initiatives, as well as the barriers to TQM implementations revealed by a number of researchers, see for example [6], EFQM model should be modified for proper application in HEI sector. The nine criteria (enablers and results) should be modified in order to reflect the unique characteristics of a HEI (student as a customer, teaching and learning, etc). Such a modification follows; see Table 1. This model includes 53 components and is harmonized with the latest developments in European Higher Education Area (EHEA) and the recommendations by European Association for Quality in Higher Education (ENQA) and European University Association (EUA); see also [12-14].

Criteria	Subcriteria
1. Leadership	1.1. Personal commitment to the development of mission, vision, main values, policy, main goals and issues in the field of quality. 1.2. Personal commitment to the development, implementing and continuous improvement of QMS in University. 1.3. Personal commitment to external activities (contacts with stakeholders: customers, suppliers, partners, society etc). 1.4. Personal commitment to feedback.
2. Policy and Strategy	2.1. Development and improvement of policy and strategy and the extent to which stakeholders are involved in these processes. 2.2. Mechanisms of information analysis and collection on HEI activities effectiveness when forming its policy and strategy. 2.3. Mechanisms of projection of policy and strategy development onto all management levels, units and main HEI processes. 2.4. Mechanisms of staff and students information on policy and strategy.
3. Staff Management	3.1. Staff policy and staff development management principles.

	<p>3.2. Mechanisms of determination of qualifying requirements to staff, its training and improvement.</p> <p>3.3. Mechanisms of staff motivation, involvement and remuneration for initiatives made to improve the quality of HEI activities.</p> <p>3.4. Feedback (staff, students, management).</p> <p>3.5. Improvement of working environment, social support and staff welfare.</p>
<p>4. Resources and Partners</p>	<p>4.1. Financial resources management.</p> <p>4.2. Material resources management.</p> <p>4.3. Study technologies and knowledge control management.</p> <p>4.4. Information resources management.</p> <p>4.5. Contacts with external partners (employers, schools, lyceums, other HEIs ).</p>
<p>5. Process Management</p>	<p>5.1. Main business-processes.</p> <p>5.1.1. Marketing research (Determination of education vision, customer demands for HEI profile, academic curricula and educational programs).</p> <p>5.1.2. HEI's academic activities development according to the main educational programs (curricular and course programs).</p> <p>5.1.3. Development of educational-methodical system for courses.</p> <p>5.1.4. Admission.</p> <p>5.1.5. Study process.</p> <p>5.1.6. Education process quality control and evaluation.</p> <p>5.1.7. Knowledge and skills acquired control (tests, exams, final exams etc).</p> <p>5.1.8. Counseling students on their study career, occupational adaptation and employment.</p> <p>5.1.9. HEI activities on continuing vocational education programs and specialist retraining.</p> <p>5.1.10. Scientific research.</p> <p>5.2. Supporting business-processes</p> <p>5.2.1. Providing education process with teaching materials and library service.</p> <p>5.2.2. Building up an educational environment.</p> <p>5.2.3. Procurement and interaction with material resources suppliers.</p> <p>5.2.4. Contacts with schools, lyceums and entrants.</p> <p>5.2.5. Educational, pedagogical and extracurricular work with students.</p> <p>5.2.6. Social student support.</p> <p>5.3. Quality Management System processes.</p> <p>5.3.1. Process approach implementation.</p> <p>5.3.2. Notes management.</p> <p>5.3.3. Planning and development of organizational structure of Quality Management System, assignment of responsibilities and authorities.</p> <p>5.3.4. Documentation management.</p> <p>5.3.5. Business-processes planning.</p> <p>5.3.6. Development, implementation and improvement of measurement and monitoring system of University processes.</p>
<p>6. Customer satisfaction</p>	<p>6.1. Students and graduates satisfaction.</p> <p>6.1.1. Mechanisms of information analysis and collection on</p>

	<p>students and graduates satisfaction.</p> <p>6.1.2. Level of students and graduates satisfaction.</p> <p>6.2. Employers satisfaction.</p> <p>6.2.1. Mechanisms of information analysis and collection on employers' satisfaction.</p> <p>6.2.2. Level of employers' satisfaction.</p>
7. Staff satisfaction	<p>7.1. Mechanisms of information analysis and collection on staff satisfaction.</p> <p>7.2. Level of staff satisfaction.</p>
8. Impact on society	<p>8.1. Mechanisms of information analysis and collection on impact on society.</p> <p>8.2. Level of HEI perception by society.</p>
9. Results of HEI activities	<p>9.1. Financial results of HEI activities.</p> <p>9.2. Other non-financial results of HEI activities.</p>

Table 1. EFQM modified models for HEI: Model criteria and subcriteria

The Technological Educational Institute of Thessalonica (T.E.I. The.) is one of the 12 TEI's comprising the Technological Sector of Greek Higher Education according to new HEI Act (Law 3549/2007). The T.E.I. The. with its current form was founded in 1983. Financial sources of the T.E.I. are mainly the Greek state and follow in smaller degree the European Union (via programs) and the industry (via financing research programs). The T.E.I. The. consists of 6 Schools one of which is the School of Technological Applications. Two departments of the Institute at this moment collaborate with two Greek Universities in order to offer postgraduate programs. Detailed information can be retrieved from TEI's web page ([www.teithe.gr](http://www.teithe.gr)).

The Department of Electronics belongs to the School of Technological Applications. The Department of Electronics has about 1100 undergraduate students, and do not provide, for the time being, postgraduate programs. 53 professors constitute the academic staff; 23 of them are tenure and 30 are employed with contract of certain time.

As far as curriculum monitoring and control is concerned the Department has fixed a permanent committee for revision of the curriculum. The committee continuously studies the needs of the market (via feedback that receives from the enterprises and former students) and proposes changes for the improvement of academic and administrative activities in order to remain competitive.

The Department decided to use the modified EFQM model presented in the

previous section, for self-assessment and in accordance with Law 3374/05 concerning "Quality Assurance in Higher Education" and the requirements implied by possible collaborations within the EHEA. A task-force group was formed and the self-assessment process was realized during the school year 2006-07. The outputs were:

- A definition of strengths and areas for improvement against each sub-criterion of the Model, ie a type of SWOT analysis.
- A set of prioritised actions that can be integrated into the business planning process.
- A score for each sub-criterion and criterion.
- An overall score.

The Academic staff of the Department works now on the implementation of the model and the realization of the corrective actions decided.

During the negotiations for a possible collaboration with a UK University (Brunel), the self-assessment documents were the basis for an audit performed by personel of Brunel on the basis of UK educational quality standards (HEFCE and QAA). The audit was successful and a joint post-graduate program (MSc in Wireless communications) was agreed, effective from this year.

Moreover, the Department developed a new strategic plan, see Figure 1, which is made up of 5 major strategic action lines such as

Teaching Innovation, Quality Management, Research Development and Reinforcement, Promotion of Life-Long Learning and Strengthening of the Institute-Society Relationship. Each one of these actions entails various sub-projects featuring both general and

specific objectives, the tasks to be carried out, a time schedule for the next four years, the indicators laid down to check that the Strategic Plan is complied with and the people responsible for its correct implementation.

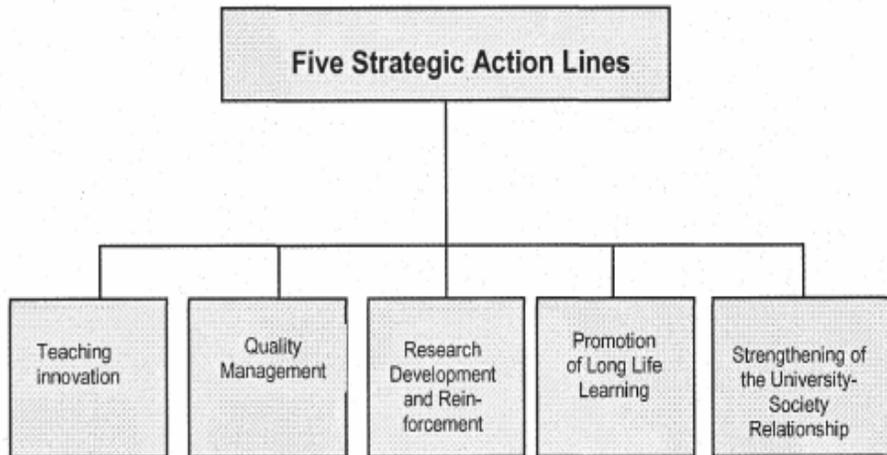


Figure 1. New strategic plan

#### 4. CONCLUSIONS

1. Implementing TQM in HEI is a necessity imposed by growing international competition of the new educational environment, recent trends in EHEA, national legislation and funding agencies.
2. The TQM framework selected for implementation should be build upon a set of core values and concepts including leadership and quality culture, continuous improvement and innovation in educational processes, employee participation and development, fast response and management of information and customer-driven quality.
3. The EFQM modified models for HEI, present in section 2 is a suitable, effective and reliable framework for this purpose, harmonized also, with the latest developments in the EHEA.
4. The implementation of this framework in the Department of Electronics / TEI of Thessalonica is, in general, successful. Based on this framework and on external assessment by a UK University, a joint post-graduate program was agreed and a new strategic plan was developed .

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