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Message from the Editors

Hello from TOJQIH

The Online Journal of Quality in Higher Education (TOJQIH) welcomes you. TOJQIH also thanks all researchers, practitioners, administrators, educators, teachers, parents, and students from all around the world for visiting the volume1 and issue 1. TOJQIH has diffused successfully innovation on quality in higher education around the world.

TOJQIH is a quarterly journal (January, April, July and October). This online periodical is devoted to the issues and applications of quality in higher education. Reviewed by leaders in the field, this publication is designed to provide a multi-disciplinary forum to present and discuss all aspects of quality in higher education.

TOJQIH provides a quality in higher education forum and focal point for readers to share and exchange their experiences and knowledge each other to create better research experiences on quality in higher education. The main purpose of this sharing and exchange should result in the growth of ideas and practical solutions that can contribute toward the improvement of quality in higher education.

TOJQIH records its appreciation of the voluntary work by the following persons, who have acted as reviewers for one or more submissions to TOJQIH for v1i2. The reviewers of this issue are drawn quite widely from quality in higher education field. Reviewers' interests and experiences match with the reviewed articles.

I am always honored to be the editor-in-chief of TOJQIH. Many persons gave their valuable contributions for this issue. I would like to thank the editorial board of this issue.

Call for Papers
TOJQIH invites article contributions. Submitted articles should be about all aspects of quality in higher education. The articles should also discuss the perspectives of students, teachers, school administrators and communities. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJQIH.
For any suggestions and comments on the international online journal TOJQIH, please do not hesitate to contact with us.

April 01, 2014
Prof. Dr. Muzaffer ELMAS
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A Critical Look At Civil Engineering In The European Higher Education Area: The Case Of Spain

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ABSTRACT

On 25 May 1998, the European Higher Education Area (EHEA) was constituted in Paris. It established the need to create a common Higher Education for all the countries of the European Union. Accordingly, the Declaration of Bologna was signed on 19 June, 1999, defining the actions necessary for Universities to adapt to the EHEA, and after ten years of study, it was put into action in Spain in 2010. This article aims to analyse the problems surrounding Education in Civil Engineering in Spain, under the dictates of the EHEA, in order to establish a Contingency Plan comprising Actions for Quality Improvement, after of the first two years of implementation of the EHEA in the Degree of Civil Engineering in the University of Granada.

Keywords: European Higher Education Area, EHEA, Civil Engineering Education, Spain, University of Granada.

1. INTRODUCTION

For over two centuries now, the capacities acquired by engineers during their education have depended substantially on the country where they studied. However, the requirements of an increasingly globalised world and the globalisation-oriented education policy promoted by the OECD (Organisation for Economic Co-operation and Development) (Kivinen et al., 2003) have generated a need for these capacities to transcend national borders (Lucena et al., 2008; Floud, 2006). In Europe, differences existing between countries make professional mobility difficult (Hernaut, 1994), largely due to the diverse professional regulations traditionally required (Maffioli et al., 2003), deriving from educational disparity. For this reason it was necessary to restructure European Higher Education (De Asís et al., 2010), in order to define a common university space where convergence among countries could be facilitated (Kivinen et al., 2003).

To this end, on 25 May, 1998, The European Higher Education Area (De Asís et al., 2010; Rodríguez-Vellando, 2009) (EHEA) was signed in Paris. This document established that the convergence of European Union Member States should not only involve economic terms, but also areas of knowledge (Sorbonne Joint Declaration, 1998), adapting curricula in terms of structures, contents, learning attributes, learning tools and assessment methods (Maffioli et al., 2003). All the Member States were called to make joint efforts to create a system of Higher Education (Maffioli et al., 2003), in which the cultural heritage of each country would be preserved (Filippov, 2006), while the presence of Europe in the world could be consolidated by means of continuous improvement and updating of the education of its citizens (Suárez, 2000). This idea took shape on 19 June, 1999, in the so-called 'Bologna Declaration' (Bologna Joint Declaration, 1999), which set out the actions to be taken by universities to adapt to this new philosophy (De Asís et al., 2010; Van der Wende, 2000):

- Promote **mobility and cooperation**, eliminating obstacles for professional activity, formation and research.
- Adopt a system based on **two formative cycles** (Anglo-American Model; Floud, 2006): Degree (180-240 ECTS; 60 ECTS per academic year) and Master (60-120 ECTS; 60 ECTS per academic year). The Degree is established as the adequate level of qualification in the European labour market, and the Master provides specialization and gives access to Doctoral studies.
- Establish a system of credits —the **ECTS** (European Credit Transfer System)— as an adequate means of promoting student mobility.

Yet certain flexibility in the duration of education in **two cycles** proposed by the Bologna Declaration (Degree in 3-4 years, Master in 1-2 additional years) led countries to finally opt for different configurations in view of the national tradition (Maffioli et al., 2003), despite the emphasis on convergence in the many meetings taking place in the arena of the EUCEET (European Civil Engineering Education and Training, a thematic network funded by the European Commission) (Rodríguez-Vellando, 2009).

Fig. 1. Engineering studies in Europe after adaption to the EHEA

In Spain, as in the rest of the European Member States, changes were filtered through the existing status of the profession and its tradition. Higher Civil Engineering, here known as '*Engineer of Roads, Canals, and Ports'* (ERCP) (the denomination of Spanish Higher Civil Engineering previous to the EHEA consisting of 5-6 years of study), was heavily influenced by the 1802 model of the '*École Nationale des Ponts et Chaussées'* of Paris, in turn founded in 1747 (Martínez et al., 2007; Marañón, 1999), with its strong theoretical basis and research orientation (Maffioli et al., 2003).

In parallel, 1854 saw the creation in Spain of the branch of Engineering called '*Public Works'* (Spanish Royal Decree of 12 April, 1854), ratified in 1969 as '*Technical Engineer in Public Works'* (TIPW) (in Spain the first university formative cycle of Civil Engineering previous to the EHEA, consisting of three years of study) (B.O.E. 13 November, 1969). In contrast, Higher Engineering has always entailed a broader scientific foundation in the first years (Suárez, 2000) (Table 1), stricter requisites for access, and above all, a determinant nature that lends full, direct legal competence to exercise the profession. This is not the case in countries such as the United States, where competence must be corroborated through a posterior process of accreditation (Prados et al., 2005). The sound scientific basis and direct attribution of full professional competence has no doubt led to the enhanced prestige of the Spanish Degree with respect to other countries (Martínez et al., 2007; Gómez, 1984), and favourable conditions for employment of Spanish Engineers during the 20th century (the engineers from this school are employed in Spain, Europe, Latin America and other countries around the world mainly African countries situated along the Mediterranean Basin)

(Martínez et al., 2007).

Table 1. Comparative example of the basic formation in 'Engineer of Roads, Canals, and Ports' (Univ. of Granada) and in Technical Engineer in Public Works (Univ. of Cadiz), (Spain).

SUBJECT	CREDITS First Year Engineer of Roads, Canals, and Ports, Univ. of Granada	CREDITS First Year Technical Engineer in Public Works, Univ. of Cadiz
Mathematics	28.5	18.0
Physics	15.0	12.0
Technical drawing	7.5	7.5
Information technology	4.5	0.0
Geology	12.0	4.5
Business	6.0	6.0
History	4.5	0.0
TOTAL	**78.0**	**48.0**

Given this background, and after a complex process of debate lasting a decade, the Spanish Royal Decree 1393/2007, 29 October, established that Civil Engineering studies in Spain under the EHEA would comprise four years to attain the Degree (240 ECTS), and one or two additional years for the Master (nearly all the Universities finally opted for two years, that is, 120 ECTS). The EHEA Master program thus came to be called '*Master of Engineer of Roads, Canals, and Ports'*, in order to conserve the original name of the profession, as Adams put it, 'to connect the new and the old' (Adams et al., 2011). Although the core denomination used for the Degree would translate as 'Civil Engineering', some Spanish Universities have added distinctive qualifying terms (altogether, 26 Spanish Universities currently offer Degree studies in Civil Engineering).

This configuration (Degree of 4 years + Master of 2 years) has stirred debate ever since its implementation (Carabaña, 2006). It departs from the pre-existing model (first cycle of Engineering of 3 years, Higher Engineering a total of 5 years), and does not fit the predominating model in Europe where, except for Germany and the *'Grandes Écoles'* of France, the Degree calls for 3 years of study (Fig. 1).

At any rate, education in Higher Engineering in Spain has gone from requiring some 400 credits to just 360 ECTS (240 Grade + 120 Master). This reduction has generally implied a lesser number of hours dedicated to the basic scientific subjects (Suárez, 2010) (Table 2). Moreover, the restructuring of contents, a task undertaken independently by each University, has given rise to Degree study programs that are even more dissimilar than before (Table 3). In sum, the objective of convergence —even among Spanish Universities— is increasingly difficult to fulfill.

Table 2. Credits in the Basic Subjects before and after Implementation of the EHEA at the University of Granada (Spain)

SUBJECT	CREDITS before EHEA	ECTS (after EHEA)
Mathematics	28.5	18
Physics	15.0	15
Technical drawing	7.5	6
Information technology	4.5	6
Geology	12.0	9
Business	6.0	6
History	4.5	0
TOTAL	**78**	**60**

Table 3. Comparative example of the subjects in the 'Module Specific Technology for Civil Construction' at the University of Granada and at the Technical University of Madrid (Spain)

UNIVERSITY OF GRANADA		TECHNICAL UNIVERSITY OF MADRID	
SUBJECT	ECTS	SUBJECT	ECTS
Civil construction	9		
Coastal Engineering	6		
Building construction	9	Building construction	7.5
Railways	6	Railways	4.5
Highways	6	Highways	4.5
Underground space	6	Underground Space	3
Environmental Engineering	6	Environmental Engineering	4.5
		Concrete and steel structures	9
		Tunnelling	3
		Transports	4.5
		Construction management	3
		Road surface	4.5
TOTAL	**48**		**48**

Adaptation to the credit system of the **ECTS** is another problematic terrain. Under the previous system, only the presence of the student in class was taken into account (10 hours of teaching per credit); yet the new ECTS credits also count the work the student must produce to pass the subject (Carabaña, 2006; Maffioli et al., 2003) —a total of 25 hours, without specifying the percentage of classroom hours (in Spain they vary from 20% to 40%). Many Degree programs in Civil Engineering, such as that of the University of Granada, have opted for 40% (UGR, 2010), so that the classroom hours of the student are still 10 hours per credit, as under the traditional system.

Meanwhile, the conceptual novelty underlying the ECTS is the transition from teaching conceived as the transmission of contents from a professor to a student, to a form of learning rooted in the autonomous activity of the student and his or her acquisition of competence (De Juan et al., 2011) and ability to transfer knowledge to any field (Caribaño, 2008). This implies a lesser number of students per class, greater emphasis on practical or laboratory lessons, more independent work done by the student, and personalized attention on the part of the professors, at the expense of classroom hours, all of which translates as an increased cost of education (Floud, 2006). These growing needs have met with a situation of economic crisis in Europe that impedes hiring more professors. As a result, we find crowded classrooms and a generalised dissatisfaction on the part of the professors, who are obliged to introduce new teaching methodologies designed for a much smaller number of students per class (Nieva et al., 2011).

In short, we may say that the adoption of the EHEA in Civil Engineering Education in Spain has proven to be a cumbersome process (De Asís et al., 2010), full of obstacles (Munar et al., 2009), representing one of the greatest changes in the field in recent years (Floud, 2006), and perhaps further hindered by the particular configuration of a profession that goes back to 1802 (Marañón, 1999.). The panorama is laden with contradictions between the general trends developed in the Bologna process and the specific needs of technical education (Hedberg, 2001). Firstly, modifications in the duration and configuration of Engineering studies, far from convergence, do not favor mobility among Spanish Universities or beyond them, in Europe (not all Member States have opted for similar systems). Secondly, we have moved from the traditional teaching model focused on the transmission of contents by a teacher in a classroom to a new model requiring independent study, which calls for a greater number of supervising professors and therefore more funding for our Universities (Masjuan et al., 2008). This is simply not feasible in the current economic straits. It is therefore evident that the academic results, and the attempts at convergence, will not live up to expectations.

2. PURPOSE

Having analysed the antecedents of the EHEA, and in light of the a priori doubts about the benefits of this system for Civil Engineering studies in Spain, we need to examine the main problems generated two years after inception of the new undergraduate programs. Our main objective is now to elaborate a Contingency Plan that proposes strategies and actions toward improvement that will help alleviate or resolve these problems, achieving the original objectives of the EHEA while enhancing the quality of the study plans and the overall formation of our students. Along these lines, a series of steps were set forth:

- Apply SWOT analysis (strengths, weaknesses, opportunities, and threats) to the adoption of the EHEA, as a tool in strategic decision-making, to identify key strategic features, and use them to make changes.
- Discover any deviations from the original objectives marked by the EHEA.
- Analyse the academic results of the students.
- Manifest the degree of satisfaction on the part of professors and students regarding the new system and the changes involved.
- Propose strategies to heighten the quality of the Degrees earned.

3. METHODOLOGY

3.1. Information Sources

In light of the Spanish Royal Decree 1393/2007 passed by the Spanish Government for the implementation of Degrees under the EHEA, the University of Granada, like the rest of Spain´s Universities, established a 'System of Internal Guarantee of Quality', coordinated by a Quality Commission within each Faculty, to appraise the consequences of the EHEA by means of a 'Plan for Improvement of the Degree Studies' every two years (Rodríguez et al., 2012a). This was to provide the basis for evaluations every five years of the status of a given study program by the ANECA (*Agencia Nacional de Evaluación de la Calidad*, or 'National Agency for Quality Evaluation'), and a posterior Accreditation of the Degree. Inspired by the Accreditation Board for Engineering and Technology (ABET) in the United States (Rugarcia, 2000), this process of accreditation could lead to denial of the Degree if the objectives set forth in the Study Plan were deemed to have gone unfulfilled (UGR, 2010).

The 'System of Internal Guarantee of Quality', a novel aspect of Spanish Universities, clearly offers a unique opportunity to examine specific problems with the new educational system and establish strategic lines for improvement in Spanish Higher Degree Programs. Accordingly, the Higher Technical College of Civil Engineering of the University of Granada created its own Quality Commission, constituted by a Degree Coordinator, a member of the Director´s team, a member of the Administrative Staff, a student representative, and a representative professor from each Department. The main functions of this Commission are (Rodríguez et al., 2012a):

- Ensure the development of the System of Internal Guarantee of Quality:
  - Analyse the information related with quality and propose guidelines for follow-up.
  - Enhance and ensure coordination among professors.
  - Define proposals for improvement, divulge them, and coordinate their implementation.
  - Carry out, every two years, a follow-up report of the Degree studies in view of the guidelines of quality established.
- Strengthen the participation of all groups involved (students, professors and Administrative/Service personnel) in the evaluation and improvement of the quality of the Degree studies.
- Oversee that efficiency and transparency prevail as principles of management.
- Take measures to facilitate the continuous and systematic improvement of Degree studies under the EHEA.

This Commission has met every trimester since the implantation of the new study program in September, 2010, creating the **'Plan for Improvement of the Degree in Civil Engineering'** (UGR, 2012b), based on **information provided by students and professors** during the meetings, and the **processing of academic results of the students** in the academic years 2010-2011 and 2011-2012 (Rodríguez et al., 2012a). This plan is the source of information used for the SWOT analysis described below.

3.2. SWOT analysis

SWOT is an acronym for strengths, weaknesses, opportunities, and threats. SWOT analysis is a widely-used tool in strategic decision-making. It can aid businesses or other organizations in identifying key strategic features, and apply them in order to introduce effective changes in the business. The idea is to identify internal aspects and external factors that are favourable or unfavourable, in order to consolidate strengths, minimize weaknesses, profit from windows of opportunity and eliminate or reduce threats. SWOT analysis can be considered as a precursor to strategic planning in organizations and business (Houben et al., 1999), although it has also been used extensively in higher education (Dyson, 2004; Gordon et al., 2000).

A SWOT matrix makes it possible to directly compare strengths with opportunities, strengths with threats, weaknesses with opportunities, and weaknesses with threats. It serves to confirm whether the relationships between them are positive, negative or neutral. It also helps determine whether the strengths and weaknesses identified might permit or impede the exploitation of opportunities, or whether they increase or decrease the threats.

To apply the SWOT analysis methodology to the evaluation of the Civil Engineering in the European Higher Education Area in the University of Granada, the following strategic planning process was used:

- Identification of strengths, weaknesses, opportunities and threats.
- Preparation of a contingency plans. A set of common strategic actions is appropriately developed applying the following guidelines:
    - Build on Strengths
    - Eliminate Weaknesses
    - Exploit Opportunities
    - Mitigate the effect of Threats or counter-act the threats

4. RESULTS

4.1. Identification of Strengths, Weaknesses, Opportunities and Threats.

After collecting and analysing the information available from the 'Plan for Improvement of the Degree in Civil Engineering' (UGR, 2012b), the SWOT methodology was applied. Results are shown in Table 4, and highlighted below.

Table 4. SWOT analysis (Strengths, Weaknesses, Opportunities and Threats): results of evaluation of the Civil Engineering Degree in the University of Granada (Spain)

STRENGTHS	WEAKNESSES
S.1. High number of applications for entry; over 4 times greater than number of vacancies.	**W.1.** Lack of previous knowledge on the part of the students.
S.2. High average mark of the new students.	**W.2.** Elimination of humanistic subjects and reduction of the basic subjects under the EHEA.
S.3. Orientation course for the first-year students.	**W.3.** High number of students admitted (200 per year).
OPPORTUNITIES	**THREATS**
O.1. Creation of the 'System of Internal Guarantee of Quality' supervised by a Commission that monitors and follows up actions toward improvement.	**T.1.** Difficulty in adopting teaching methodologies focused on more independent student learning.
	T.2. Irregular academic results.
	T.3. Dropout rates.
	T.4. Limited resources of the 'Orientation course for first-cycle students'.

STRENGTHS

The main Strength identified is directly related with the excellent external assessment of the Degree, which results in over **4 times as many student applications as the number admitted (S.1.)** (in 2011 the demand/supply ratio was 418%; http://www.ugr.es/~calidadtitulo/web/p1b2012.pdf). For this reason, **the average mark of the students admitted is very high** (8.4 out of 10) **(S.2.)** (Rodríguez et al., 2012b), and the student profile overall is of high potential.

The existence of the so-called **'Orientation Course for first-year students of the Civil Engineering Degree' (S.3.)** complements the formation of newly admitted students in terms of basic subject matter, and provides the groundwork for facing Technical Studies by organizing study material in a more efficient manner (Alegre et al., 2011). The classes are imparted by professors responsible for the first-year subjects, which strongly benefits the students.

OPPORTUNITIES

The most relevant Opportunity with regard to the EHEA is, clearly, the creation of the **'System of Internal Guarantee of Quality'** and the corresponding **'Quality Commission' (O.1.)**, to analyse problems with the new educational system and make proposals for improvement within the 'Plan for Improvement of the Degree' (UGR, 2012b). This system allows for dialogue on common ground between professors and students, enriching input and feedback.

WEAKNESSES

The most noteworthy Weaknesses detected are closely associated with the present traits of the University system in Spain; namely, there is a **deficit of previous knowledge among the student body (W.1.)**. As underlined by García-Almeida (2012), previous knowledge is fundamental for University students to absorb later contents and obtain good academic results (García-Almeida et al., 2012). In the meetings with first-year professors, the lack of preparation of the new students in basic scientific matters was a recurrent topic (Table 2), even though these students had a high average grade for entry to the University. This would point to a deficient testing program for access to the University, which has been the object of heated debate for many years already (Muñoz-Repiso et al., 1999; Grau et al., 2002).

In second place, the reduction in total credits imposed by the EHEA has meant the **elimination of the subjects of a humanistic character that were previously part of the curriculum** (History and Engineering Ethics) **and adjustments of the basic subjects (W.2.)** (Table 2), a move in the opposite direction of the 'Ideal Education in Engineering' defended by numerous authors (Monteith, 1994): a liberal education in philosophy and arts, and cultivation of human qualities, together with training in mathematics and science, in that order of priority (Monteith, 1994), and transmission to future professionals of a sense of ethical and societal responsibility (Gorman et al., 2001). This would be complemented by a marked trend toward Socio-Technical Engineering Education, to link Research and Practice (Turns et al., 2006) in a field characterized by a certain propensity to separate the technical from the social (Adams et al., 2011). An engineer is not the equivalent of a scientist, as math and engineering science are merely tools for development, not ends in themselves (Seely, 1999), but the integrated advancement of mathematical and scientific concepts is indeed desirable (Bucciarelli et al., 2000), in a context of understanding and application, reconciling the abstract and the concrete (Adams et al., 2011). In other words, professors and the field as a whole should aspire to a translation of scientific principles into engineering practice (Burnet et al., 1994), maintaining a balance between concrete and abstract contents (Felder et al., 2000).

Finally, the **high number of new admissions** (200 per year) (**W.3.**), makes it difficult to establish adequate programs for following up the first-year students, especially in the face of a shrinking teaching staff. Mentors are key figures for students making the transition to the University (Valverde et al., 2003), and they help reduce dropout rates, which range between 20% and 50% of students in Spanish Engineering Higher Technical Colleges (UTEC, 2008). The Degree in Civil Engineering of the University of Granada has set a threshold value of 30% as the highest tolerated value for abandoning studies (UGR, 2010), and this figure is closely related with the success of mentor programs.

THREATS

Linked with the Weaknesses inherent in the present-day University system, a series of Threats interferes with the Quality Guarantee System. Most importantly perhaps, an excessive number of students per classroom has generated considerable **difficulties for adopting teaching methodologies oriented toward more independent student learning and production (as foreseen in the EHEA) (T.1.)**, causing additional problems in the knowledge transmission (Nieva et al., 2011), accompanied by manifest dissatisfaction on the part of professors and students alike. In the first academic year of Civil Engineering Degree studies, 87% of the classes had more than 65 students (the maximum established by the University Of Granada; UGR, 2012a). In the second year, this figure rose to 93%. Clearly, such figures are incompatible with the indexes of quality proposed in incompliance with one of the most basic

prerequisites set forth for adaptation to the EHEA.

Such contradictions have repercussions for the academic performance of students. As reflected in Fig. 2, there is a remarkable increase in passing marks during the academic year 2010-2011 with respect to the previous one, when the EHEA was not yet in effect. According to the professors, this can be explained by the generally lower demands made upon the students for a passing grade. Such a trend would logically result in a deficit of knowledge in later years. For this reason, in the following year (2011-2012), the Higher Technical College attempted a more realistic evaluation, resulting in 20% fewer passing marks. Such **irregular academic results (T.2.)** stand as a clear Threat for the achievement of quality objectives in the Civil Engineering Degree study program, revealing a dire need for improvement.
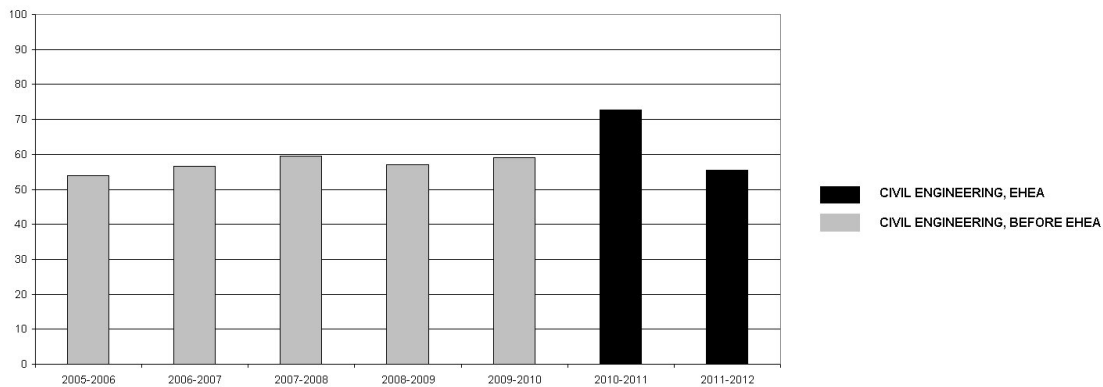
Fig. 2. Percentage of credits passed by the students in the Civil Engineering Degree at the University of Granada (Spain)

Substantial disparity can also be seen in the **results of groups in one single academic year (T.2.)**. A look at passing grades between the groups who have class in the morning versus the afternoon shows over 20% more morning passing grades in 2010-2011 and nearly 15% more in 2011-2012 (Rodríguez et al., 2012b). This may be because the students who choose a class early on in the registration process are the ones with better incoming average mark, and prefer the morning timetable, while the ones with poorer incoming grades end up in the afternoon classes. Nevertheless, a look at the average mark of access to the University of the students in the first year in 2010-2011 shows that the morning groups have an average incoming grade of about 8.6 out of 10, whereas the afternoon groups have a mark of about 8 out of 10, a difference that is insignificant (Rodríguez et al., 2012b). Many students explain that the hours of class, study and sleep are better utilized when classes are given in the morning hours, and prefer to sign up for the earlier classes. Yet if all teaching was scheduled in the morning to enhance student performance, there would be other conflicts (e.g. for students who have part-time work in the daytime), and a need for more resources in terms of professors and classrooms, making this measure impractical in the current context.

As a result of the main Weakness described, the excessive number of students in the classrooms, a very considerable Threat arises, **the dropout rates (T.3.)**. This fact, traditionally attributed to the difficulty in subject matter imparted, also stems from the lack of connection between student and professor. The importance of creating connections and interacting with students is undeniable (Adams et al., 2011; Conley et al., 2000). It is impossible to monitor the progress of all students, and some will invariable fall through the cracks in the system before finishing their courses. A comparison of the so-called 'Total Pass Rate' (considering the number of total credits per academic year) with the 'Success Rate' (considering only the number of credits of exams taken) (Rodríguez et al., 2012b), (Fig. 3) shows the difference to be greater than 15%, indicating a considerable percentage of abandoned subjects. Similarly, the goal set by the Universidad de Granada and its Degree in Civil Engineering Program in the face of future evaluations by ANECA is 60% for 'Total Pass Rate' and 80% for 'Success Rate' (UGR, 2010). As seen in Fig. 3, these rates are lower in the academic year 2011-2012, suggesting a need to take measures in this direction.
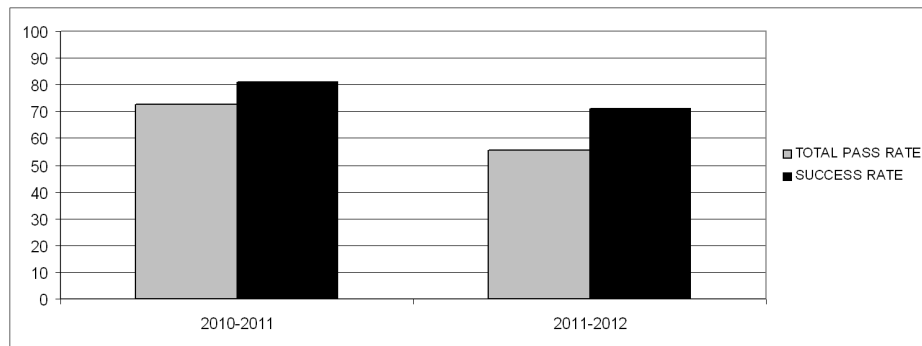
Fig. 3. 'Total Pass Rate' and 'Success Rate' of Civil Engineering Degree in the University of Granada, (Spain)

Finally, the **limited resources** of the **'Orientation Course for first-year students' (T.4.),** has given disappointing results. The number of hours applied is clearly insufficient, according to the professors involved; besides the teaching hours of the professors are not acknowledged, turning this into an entirely altruistic initiative. Clearly, in view of the deficit in incoming student knowledge, there is a need to reinforce this course through adequate funding.

4.2. Preparation of a contingency plans

The results of the SWOT analysis served as the groundwork for a Contingency Plan (Table 5), formulating strategic actions to build on the Strengths, to eliminate the Weaknesses, to exploit the Opportunities and to mitigate the effect of Threats. We also explored associations between the strategies defined around the Strengths, Weaknesses, Opportunities and Threats described, as some actions could help achieve more than one goal. Launching this Plan and its 5 strategies would bring us closer to the original objectives of the EHEA, improving the study programs and students´ academic performance.

Table 5. Contingency Plan; Strategies and Actions for Quality Improvement of the Civil Engineering Degree at the University of Granada, (Spain)

SWOT STRATEGIES	SWOT	ACTIONS FOR QUALITY IMPROVEMENT
A. Improve diffusion of the degree to maintain high demand of access and attract the best students.	S.1. S.2.	**A.1.** Improve information available on the Web about the Degree, results, and access to the job market.
		A.2. Organize Career Fairs and Information Days for high school students to publicise the Degree.
B. Improve previous formation of students admitted to the University.	W.1. S.3.	**B.1.** Adapt and improve the process of access to the University.
	T.4.	**B.2.** Fortify the 'Orientation course for first-year students'.
C. Reinforce the activity of the Quality Commission.	O.1.	**C.1.** Involve professors and students in decision-making to improve the Degree program.
D. Reinforce basic subjects.	W.2.	**D.1.** Propose changes in the Study Plan, increasing the number of ECTS dedicated to basic subjects.

E. Reduce number of students per class and support mentorship.	**W.3.**	**E.1.** Decrease number of students admitted.
	T.1.	**E.2.** Increase number of classes.
	T.2.	**E.3.** Increase number of morning classes.
	T.3.	**E.4.** Increase number of professors.

The Higher Technical College of Civil Engineering of the University of Granada has recently embarked on some of the directions for improvement defined in this plan, specifically, those related with its competences. We will have to wait at least two years to determine whether the measures lead to the desired results. The current state of affairs can be summed up as:

- **A.1.** In the past year, the Higher Technical College of Engineering has invested much effort in improving and divulging information about the Degree on their webpage (http://etsiccp.ugr.es/); a substantial increase in visits should be seen in the coming years.
- **A.2.** There is an annual Career Fair for secondary school students from the entire province of Granada, providing information about the characteristics of the Degree and a guided visit of the Higher Technical College itself (laboratories, departments, classrooms…) (http://creces.ugr.es/pages/jornadas_acceso_universidad/granada).
- **C.1.** A Coordinator is designated every semester to facilitate fast, direct communication between professors and students (http://grados.ugr.es/civil/pages/infoacademica/coordinacion).

The actions of the Contingency Plan that do not depend directly on the Higher Technical College of Engineering have been presented as a request before the University of Granada, so that they may be put into effect progressively, as the economic situation allows. For the time being:

- **B.1.** We have stressed the lack in previous knowledge observed among new students, so that the University can establish appropriate measures.
- **B.2.** We have called for recognition of the hours and professors involved in teaching the 'Orientation course for first-year students'.
- **D.1.** We have requested an increase in ECTS for the subject 'Mathematics' within the Plan for Degree Improvement 2011-2012. The University is currently studying this means of action for the next academic year.
- **E.1.** A reduction in the number of incoming students was proposed, but the University has expressed its disagreement given that it means a decrease in income.
- **E.2.** An increased number of classes (that is, more groups with fewer students in each) has been requested for the 1st, 2nd, and 3rd years of study. This was granted for 2nd, and 3rd, but not for 1st.
- **E.3**. A greater number of morning classes was proposed, but the lack of classrooms and professors makes it impossible.
- **E.4.** We have asked that new professors be hired, but for economic reasons this request has been denied.

As is evident, most of the actions proposed depend on the central administration of the University of Granada, and it is unlikely that they will be put into effect due to the present economic restrictions. It may take some time for us to see significant improvement along these lines.

5. CONCLUSIONS

On the basis of the analysis expounded here, we arrive at the following conclusions:

- Adaptation of Spain´s Civil Engineering studies to the EHEA has come as an abrupt change, generating considerable modifications in the duration and configuration of studies, which are hardly compatible with the present system and circumstances, and do not promote mobility with other European countries.
- The outstanding Strength of the Degree studies in Civil Engineering at the University of Granada in the face of this challenge resides in the high appraisal of this Degree, in Spain and elsewhere in Europe, which accentuates demand for this program: there are over four times as many applicants as students admitted (200).
- The main Opportunity to be found in the adaptation to this system is the Creation of a 'System of Internal Guarantee of Quality' supervised by an *ad hoc* Commission that monitors learning and establishes actions to promote effective teaching.
- The most important Weaknesses are associated with current characteristics of the University system, and do not depend directly on the Higher Technical College of Engineering.
- The Threats detected are very closely linked to the present lack of economic resources of the Universities in Spain.
- The Contingency Plan developed by the Higher Technical College of Civil Engineering of the University of Granada appears as a noteworthy tool for identifying key Weaknesses and Threats that may be traced to the process of adaptation to the EHEA, and it can be seen as an aid to improve the quality of teaching and the success of its graduates. Further analysis in the coming years would be necessary to determine the extent of fulfillment of this Plan and the results produced.
- The conclusions obtained in this research study may be extrapolated to Engineering studies in other European countries, for which reason the Contingency Plan described here might serve other Higher Technical Colleges of Engineering when appraising or resolving their problems of adaptation to the EHEA.

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A investigation on satisfaction of graduate students in China

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ABSTRACT

During October to December 2011, Research Center for Graduate Education of Beijing Institute of Technology launched a great investigation on students' satisfaction with graduate education in 35 different level and type graduate education institutes around China, involving 7293 graduate student respondents. And that aims to evaluating the quality of graduate education based on the perspective of students' satisfaction. Some valuable conclusions can be drawn from the study: By and large, over 60% of graduate students, according to the investigation result, are satisfied with current situation; while certain difference exist among different kinds of graduate groups, male students show higher satisfaction than female students; the students in research institutes show higher satisfaction than the students in colleges; medical students show the highest satisfaction than the students studying at any other majors; the doctoral candidates show higher satisfaction than the master degree candidates; the academic degree graduate students show a little higher satisfaction than the professional degree graduate students. In addition, the weak point of graduate education lies on management and services.

Keywords: graduate students; satisfaction; investigation

A Great leap-forward development has occurred in the graduate education of China, which makes us one of those countries with rich education resource, since the reform and opening-up policy has been implemented and we have entered the 21st century in particular. By the end of 2011, 1645.8 thousand of graduate students have been enrolled, among which doctoral students accounts for 271.3 thousand and 1374.6 thousand for master students. The satisfaction of graduate students reflect the situation in each and every aspect of graduate education, as they are the subject of education as well as the main force in scientific research.

To get a comprehensive understanding of the satisfaction state of the graduates, a project named "Graduate Students' Satisfaction Investigation" was launched in 2011 by Research Center for Graduate Education, Beijing Institute of Technology. In the investigation, 35 graduate education entities were selected as samples, including 17 research-oriented universities (985 Project[1]), 8 national key universities (211 Project[2]), 8 local colleges and 2 scientific research institutions. In total, 7293 effective graduate samples were acquired. A LIKERT five-grade scale（very satisfied; satisfy; general; dissatisfied; very dissatisfied） covering course teaching, scientific research training, instructor mentoring, management & services of graduate education is applied in the investigation. This report is to display to social public the current condition and related issues on graduate satisfaction based on statistic data analysis of investigation results.

I. As a whole, more than sixty percent of graduates are satisfied, while the highest satisfaction rate lies on instructor mentoring.

According to the investigation results, generally 63.1% of graduates show their satisfaction for the current graduate education, but at the same time, 8% of graduates vote for dissatisfaction. Among the investigation items, approximately 80% of graduates express satisfaction for instructor mentoring, which holds the highest satisfaction rate. It's worth noting that the graduates show a negative assessment for the management and services of education

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[1] In May 1998, China launched a program to support some top universities, which is called "985 project",39 totally universities involved the program by the end of 2012.

[2] Another program to support some key universities, aiming to construct about 100 key universities in 21st centry, which is called "211 project", 112 totally universities involved the program by the end of 2012.

entities, as low as 60% for the satisfaction rate, while 11% for the dissatisfaction rate, which tops the investigation items in dissatisfaction rate.

Items	Satisfaction Rate	General	Dissatisfaction Rate
Instructor Mentoring	78.6%	16.9%	4.5%
Scientific Research Training	66.0%	27.0%	7.0%
Course Teaching	67.0%	26.9%	7.1%
Management & Services	61.2%	27.8%	11.0%
Graduate Education in Total	63.1%	29.0%	7.9%

Note: satisfaction rate refers to the proportion of "Very Satisfied" and "Satisfied" voted by graduate students; dissatisfied rate refers to the proportion of "dissatisfied" and "Very Dissatisfied" voted by graduate students.

a. In the item of course teaching, the satisfaction rate for curriculum system voted by graduates is less than 60%, while the dissatisfaction rate reaches 10%. As for the teachers' teaching level, 70% of graduates show their approval, and a quarter for general assessment.

Items	Satisfaction Rate	General	Dissatisfaction Rate
Curriculum System Rationality	58.9%	31.1%	10.0%
Teachers' Teaching Level	69.4%	24.8%	5.8%

The investigation for course content shows that: first, 46.9% of graduates vote for "General" for the amount of course, while 45.2% for "Very Large Amount" and "Relatively Large Amount" and 7.9% for "Very Small Amount" and "Relatively Small Amount"; second, 53.1% of graduates think that the course content is of little depth; third, 53.6% of graduates vote for "General", "Relatively Weak" and "Very Weak" for the advance nature of course content.

As for the ability improvement of course teaching, 56.1% of graduates consider "Relatively Big" or "Very Big" effect on improving their learning abilities. Nearly sixty percent (59.0%) of graduates think of "General", "Relatively Small" or "Very Small" effect on improving their innovation abilities, and at the same time, 50.2% of graduates vote for "Relatively Big" or "Very Big" effect on improving their scientific research abilities.

b. In the item of scientific research training investigation, more than a quarter of graduates express that they haven't been involved in any scientific research project, while 34.7% of graduates have been part of 1 project and 23.8% for 2 projects, 15.5% for 3 projects and more. Among those that have been involved in projects, graduates who vote for "Relatively High" or "Very High" academic price of scientific research work only account for 43.6%, while those who give general or negative opinions reach 56.4%. Besides, graduates hold low appraisals for the scientific research subsidies from their instructors, with 41.7% of satisfaction rate and 22.7% of dissatisfaction rate.

In the aspect of ability improvement of research training, nearly 70% of graduates think that participating in scientific research work has "Very Big" and "Relatively Big" effect on improving learning abilities, practice abilities and academic accomplishment. However, only 63.3% of graduates consider "Very Big" and "Relatively Big" effect on improving innovation abilities, and nearly 30% vote for "General". Graduates hold low assessment for improving employment competitiveness: only 53.9% for "Very Big" and "Relatively Big", and over 30% vote for "General".

c. In the item of instructor mentoring investigation, nearly 90% of graduates feel satisfied with the professors' academic level and moral cultivation, so the dissatisfaction rate is very low. As for the assessment of mentoring frequency of the instructors, nearly three fourths of graduates give satisfied opinion, and 20% vote for "General". In the case of employment support from the instructors, nearly two thirds of graduates consider satisfied, while nearly a quarter vote for "General".

Items	Satisfaction Rate	General	Dissatisfaction Rate
Academic Level	88.6%	9.7%	1.7%
Moral Cultivation	88.5%	9.6%	1.9%
Mentoring Frequency	74.4%	19.9%	5.7%
Employment Support	66.6%	24.8%	8.6%

In the aspect of improving overall quality affected by instructors, a large proportion of graduates vote for "Relatively Big" or "Very Big" effect from the instructors in major knowledge, scientific research ability, academic interest, studying attitude as well as moral cultivation. Among them, studying attitude and moral cultivation are in the top and second position, accounting for 77.6% and 76.3% respectively. By contrast, academic interest is relatively low voted, only for 68.9%, and 25.4% of graduates vote for "General" effect, which is apparently higher than the rest four investigation options.

d. In the item of management and services investigation, less than half of graduates are satisfied with the scholarships and Three-Aid Posts provided by the education entities. While 20% of graduates show dissatisfaction, nearly one third of graduates vote for "General".

Items	Satisfaction Rate	General	Dissatisfaction Rate
Scholarships	48.6%	32.0%	19.4%
Three-Aid Posts	47.1%	35.3%	17.6%

Nearly two thirds of graduates show satisfaction for the academic atmosphere in education entities, and only 7.4% of graduates vote for negative opinion, but a quarter of graduates also hold general assessment. Only more than half of graduates are satisfied with the management system and over one third of graduates also hold general opinion. Only 42.5% of graduates are satisfied with the scientific research support of the education entities, while nearly 20% of graduates consider dissatisfied.

Items	Satisfaction Rate	General	Dissatisfaction Rate
Academic Atmosphere	67.1%	25.5%	7.4%
Management System	54.2%	35.0%	10.7%
Scientific Research Support	42.5%	38.4%	19.1%

As for the infrastructures of mess hall, dormitory and library, graduates' lowest assessments go to mess hall and dormitory, especially only 40.7% of satisfaction rate for mess hall. By contrast, library gets a relatively high assessment, accounting for 66.7% of satisfaction rate.

Items	Satisfaction Rate	General	Dissatisfaction Rate
Mess Hall	40.7%	30.2%	29.2%
Dormitory	49.3%	30.0%	20.6%
Library	66.7%	22.9%	10.4%

II. Difference among different kinds of graduate student groups

The investigation shows that certain difference among graduate student groups of different genders, education entities, major categories, degree levels and degree types.

a. The satisfaction rates of male students are higher than those of female students

According to the investigation, generally the satisfaction rates of male students are higher than those of female students. The same status is showed in instructor mentoring, scientific research training and course teaching. It's particularly obvious in scientific research training, and male students hold over 10% than female students. At the same time, they show less dissatisfaction in instructor mentoring and scientific research training.

Total/Instructor Mentoring/Scientific Research Training/Course Teaching

Gender	Satisfaction Rate	Dissatisfaction Rate
Male Students	65.0%/80.5%/70.2%/68.6%	7.7%/3.9%/5.6%/7.1%
Female Students	60.4%/75.7%/59.8%/64.7%	8.1%/5.3%/8.9%/7.0%

b. The scientific research institutes holds higher satisfaction rate than universities, and the lowest satisfaction rate comes from local colleges

Overall, satisfaction evaluation of scientific research institutes is higher than colleges and universities. Not only overall satisfaction but scientific research training satisfaction is higher than colleges and universities, while their dissatisfaction rate is lower than latter. In different kinds of colleges and universities, satisfaction evaluations of colleges of 985-project and 21-project don't have obvious difference, and in 211-project colleges, tutor guidance satisfaction is nearly 4% higher, while dissatisfaction evaluation is slightly better than that of 985-project colleges and universities. Satisfaction evaluation of local colleges is not optimistic, whose satisfaction rate is significantly lower than other kinds' cultivating units, but with dissatisfaction rate on the contrary.

Total/Instructor Mentoring/Scientific Research Training/Course Teaching

Items	Satisfaction Rate	Dissatisfaction Rate
Research Institutions	67.5%/80.6%/72.9%/68.1%	4.3%/3.0%/3.2%/5.0%
985-poject colleges	65.0%/78.7%/68.4%/69.2%	7.8%/4.7%/6.7%/7.6%
211-project colleges	65.3%/82.3%/64.7%/67.1%	7.3%/4.1%/6.5%/6.0%
Local colleges	52.6%/72.3%/58.1%/59.3%	10.2%/4.8%/9.4%/7.8%

c. Medical student has the highest satisfaction, while agronomy student holds the lowest.

In various disciplines, satisfaction evaluation of medical student is significantly better than other disciplines student. Next are science, engineering, humanities and social sciences students, among which, the humanities students' satisfaction rate on research training is significantly lower than other disciplines students, while the dissatisfaction rate is higher than other disciplines students. Agronomy student holds the lowest satisfaction, but only on the scientific research training, satisfaction rate is better than the humanities and social sciences student.

Total/Instructor Mentoring/Scientific Research Training/Course Teaching

Disciplines	Satisfaction Rate	Dissatisfaction Rate
Medical Science	82.0%/87.6%/80.7%/78.2%	3.5%/3.0%/2.6%/3.4%
Natural Science	68.2%/81.7%/75.4%/71.6%	6.7%/3.2%/5.8%/6.0%
Engineering	65.6%/80.3%/70.5%/68.6%	7.3%/4.3%/5.2%/6.6%
Humanities	59.6%/75.0%/51.8%/67.0%	9.1%/3.5%/13.0%/8.0%
Social Science	56.5%/75.5%/55.5%/63.4%	9.7%/5.9%/10.5%/8.5%
Agronomy	55.4%/73.3%/64.3%/59.4%	7.8%/7.6%/4.4%/6.2%

Note: humanities include philosophy, literature, history and arts; social sciences include economics, education, management and law.

d. Doctoral students holds higher satisfaction rate than master students

Satisfaction rate of doctoral student is significantly higher than master students, and the dissatisfaction rate is lower than the latter. Besides, doctoral research training satisfaction rate is nearly 20% higher than that of master students.

Total/Instructor Mentoring/Scientific Research Training/Course Teaching

Degree	Satisfaction Rate	Dissatisfaction Rate
Doctor	70.9%/81.7%/79.8%/72.6%	5.6%/4.4%/3.3%/5.0%
Master	61.2%/77.8%/62.5%/65.5%	8.5%/4.5%/7.9%/7.6%

e. Academic degree satisfaction rate is higher than professional degree

Academic degree satisfaction rate is higher than that of professional degree, while its dissatisfaction rate is lower than professional degree, but the difference is not obvious.

Total/Instructor Mentoring/Scientific Research Training/Course Teaching

Degree	Satisfaction Rate	Dissatisfaction Rate
Academic degree	63.5%/78.7%/66.5%/67.3%	7.8%/4.3%/6.6%/6.8%
professional degree	61.9%/77.8%/63.9%/65.3%	8.4%/5.2%/8.4%/8.1%

III. Investigation Results

Currently, comprehensively improving the quality has become the core task of the reform and development of graduate education, among which improving the quality of graduate cultivation is a top priority, which requires to fully arouse the initiative and enthusiasm of the tutors and graduate students. Through the graduate student's perspective, satisfaction investigation reveals the problems of graduate education, which has enlightening significance to the graduate education policy making.

a. Graduate student satisfaction still leaves great room to improve

Although generally there are more than 60% of graduates showing satisfaction, but nearly a third of the graduate students also consider as general, which leaves a large space for improving. Looking from different group categories, girls' satisfaction rate is slightly higher than 60%, which is nearly 5% lower than that of boys; Only 50% of satisfaction of local colleges is far lower than the scientific research institutes; The satisfaction of humanities and social science and agronomy students do not exceed 60%; master students' satisfaction rate is slightly higher than 60%, nearly 10% less than doctoral students. By comparing, we can see that "disadvantaged" group of graduate students need special attention in graduate education.

b. Course teaching cannot meet the needs of graduates

More than two thirds of graduate students are satisfied with the course teaching, but further investigation finds that more than half of graduate students give negative feedback on the depth and amount of curriculum content and leading nature. As for improving students' abilities in the course, more than half of the graduate students hold a positive attitude to learning and scientific research ability improving, but only 40% of the graduate students vote for improving innovation ability. What is noteworthy is that the satisfaction of graduate students of local colleges and agronomy student do not exceed 60%.

c. The quality of scientific research training needs to be improved

The investigation finds that more than a quarter of graduate students have not been involved in research projects. At the same time, only more than 40% of graduate students who have been involved in research projects consider as high academic content, and are satisfied with mentor's research grants. In addition, graduate students' evaluation on improving innovation ability and employment competitiveness from scientific research is relatively low. The satisfaction rates of female students, local colleges and humanities and social science student are less than 60%.

d. Management and services are the weakness of education entities

The investigation results indicate that the satisfaction rates of graduate students for scholarships, grants and scientific research support are less than 50%, while dissatisfaction rate is close to 20% at the same time. The satisfaction on board and room reach is particularly bad with dissatisfaction rate close to 30%. Therefore, the colleges and institutes should strengthen the infrastructure improvements and increase scholarships, creating a loose and free academic atmosphere for graduate students.

High Stake Testing At The Entrance To Higher Education In Turkey

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ABSTRACT

In Turkey the imbalance between supply and demand for tertiary education is the main reason for having the Student Selection Examination (SSPE) at the entrance. SSPE is being criticized by everyone but it is acknowledged by the whole society for some thirty years. The resources allocated to higher education are very low. Therefore it is obligatory to select the most capable students to make the investment most efficient. Student success at school of course is a very important factor, but there is some evidence that it is not as predictive as SSPE. The reliability of SSPE battery is quite high. A selection test is not supposed to cover the whole domain of all subject matter areas. The main purpose of SSPE is not to appraise present competencies but to predict the future performance. SSPE must be maintained as a fair balance for justice rather than a jack of all trades.

Keywords:

INTRODUCTION

The purpose of this study is to delineate some critical aspects of Student Selection Examination (SSPE) at the entrance to higher education (osym.gov.tr). Selecting and sorting is very intricate and delicate task for everybody but especially for educators. No matter what the reason is it is very hard to discriminate among people. To begin with we can admit that such an examination is a merciless, a cruel elimination mechanism. It perpetuates the inequality in education favoring the rich over the poor, the male over the female, the urban over the rural. It is a fact that those who possess the resources become more successful in this exam. It is a fact that there are gaps between schools, towns, regions, with regard to the performance in the exam. The aim of the exam is not to make them even, but to distinguish between the equals as well.

Reasons for Student Selection

The exam is a means of assessment and the aim of the assessment is not to change the reality, but to depict it as it is! The success or the failure at the exam is not the reason of inequality, but its consequence. The reasons behind the inequality are factors that have been created, and ongoing for years before the exam.

Why are we then still obliged to maintain this apparatus?

What are the compelling forces for making such tough discriminations between young people every year?

In general, there are two reasons for the system of selection:

1. There may be prerequisites or minimum entry requirements for the educational program. For example, no conservatory would admit someone with a hearing disability, no matter what the quota is. Some visual capabilities may be required at the entrance to the schools where they train aircraft captains. Shortly whenever or wherever there are minimum requirements for admittance then we have to have a selection program.

2. Another reason why we have to select is because there is imbalance between the supply and demand. No one can accommodate in a small room a larger audience than its capacity. Each year, Turkey can admit three-to-four hundred thousands school graduates to tertiary education. The demand is around one and a half million.

Facts and Figures from Turkey

Some indicators of the resources that Turkey allocates to education can be seen in Figure 1.
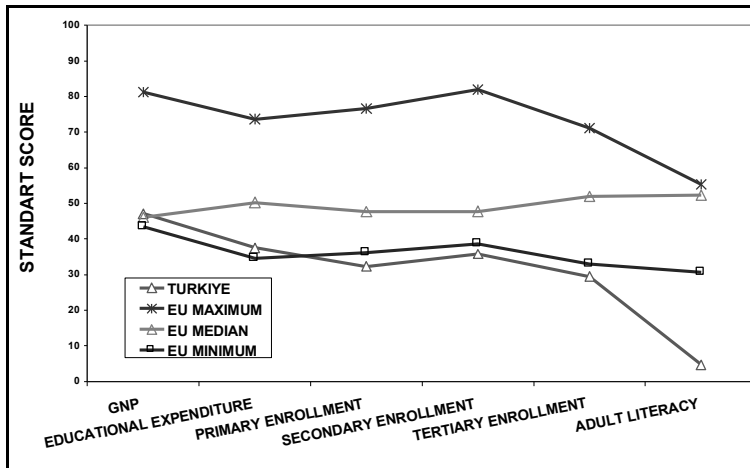
Figure 1: Turkey and EU: Educational Indicators (Baykal,)

The money allocated to education can be seen here. We can see basic education schooling, secondary education, schooling at tertiary education level, and finally adult literacy in Turkey. As can be seen in the graph Turkey is around the minimum level in each indicator within the European countries. Whereas Turkey is among the first 20 big economies of the world in terms of GDP (PWIF 2003). Obviously Turkey fails to supply sufficient resources for tertiary education to meet the demand. Figure 2 illustrates the student inflow at the entrance to higher education in Turkey until recently.
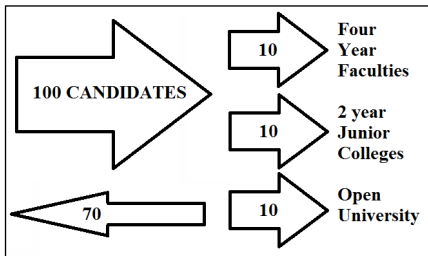
Figure 2: Student Inflow at the Entrance to Higher Education in Turkey

Does this demand cause a cram at the entrance to the higher education institutions? First of all cram is a misleading portrayal. There is not a big demand for higher education in Turkey. When we look at the potential population and the numbers of the applicants in Table 1 we can see that this is not the case. The percentage of potential in total population is 7.6% between ages 19 to 22. Percentage of applicants is only 2.4.

Table 1: Potential Population at the Entrance to Higher Education in Turkey

Years	Age 19-22	Applicants	Ratio
2010	5450	1513	0,28
2011	5390	1692	0,31
2012	5372	1895	0,35

Recently more than 5 million people are at an age to enter the university. And we have applications of 1,5 million. Almost half of them are trying their chances repeatedly every year. So, there is no such crowding in the demand. Only 1 to 1.5 million apply to enter. But since the facilities are limited, so is the possibility to get through. Out of 1000 students who finish the elementary school 70 only are able to complete the university in the next ten years. The enrollment at formal higher educational institutions is above 50 % in highly evolved countries and 20% in developing countries. In Turkey, the supply for education in general and higher education in particular, is so limited that there is a crowd of young population before the higher education. In any case, it is better for them than to form a crowd at soccer stadiums, in smoky cafes, unskilled labor recruitment markets, noisy discos, or extremist sects. Enigmatically, as if this were a negative attitude, there are talks of restricting the demand for higher education.

EXPECTED vs. OBSERVED PHENOMENA

Even if selection is mandatory aren't there alternatives to the exam? There are some as follows:

a. If the future of the country and of the society can be gambled applicants might be selected by draws, or lotteries,

b. If there was no risk of power struggle between the ruling class in the society and the academic administration applicants can be admitted by recommendation letters,

c. if it doesn't hurt the feelings of justice quotas at the universities can be sold at auctions,

d. if there was no fear of corruption, and bribery the students could have been admitted on the basis of grade point average attained at the secondary level.

All of the above have been tested and renounced in a variety of situations. We ended up to have an examination after each disappointment.

What are the desirable attributes of an selection and placement examinations? To what extent SSPE satisfies the criteria to be met?

In general there are three qualities for the accountability of a testing procedure: Reliability, validity and practicality. By reliability we do not just refer to the honesty of the people who take the exam, and of the people who organize the exam, but especially to the extent that measurement is free from random error. There are different types of reliability. Within the scope of this paper key reliability, scorer reliability, and the internal reliability of the test will be emphasized. Key reliability is the consistency between the answer keys prepared by the experts. This can be assured before the multiple choice exams. Scorer reliability is the consistency between the scores given by different scorers. This is also perfect in multiple choice exams. In essay exams however if we have 150 experts who evaluate the questions that we prepare, we'd have different answers from every single one of them. In scoring essays "halo effect" is an unavoidable source of error. Halo effect is something to do with the perception of people. It is not something that has to do with dishonesty. Each perceived stimulation usually affects the next one. For example, when we push our hand in hot water and then take it out and put it into warm water, we perceive it to be colder than it actually is. Halo effect applies to scoring essays. Every paper scored affects the score of the next paper. An average paper looks better after a poor one, or the same average response looks worse than it really is if it had been scored after a good one. To sum up scorer reliability is very low in scoring in written and oral exams. It is also very expensive, time taking and difficult to score essays and performance.

Objectivity

Objectivity in scoring examinations is very important in Turkey. Why? The Economist Magazine published a Pocket World in Figures 2003. One of the indicators about development and quality of life. is corruption perception. Unfortunately, Turkey ranks very bad in the perception of corruption, whether or not we have corruption, that's something to be questioned. But in Turkey, when we carry out, for example, a written examination, there has always been a sense, a perception that there is some kind of negative discrimination.
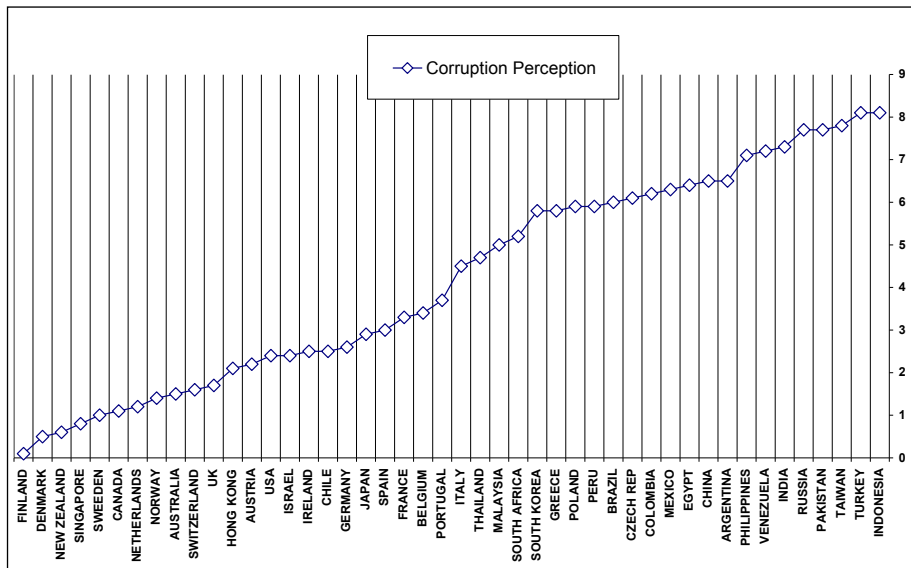
Figure 3: Corruption Perception Index in the Biggest Economies of the World (PWIF; 2003)

eIntersubject reliability

There are different methods and formulas to compute the internal consistency of scores obtained with a multiple choice test. Inter-subject reliability is something that ranks between 1 and 0. If it is zero it means that the scores are totally random, but the closer it gets to 1 it becomes more and more free from randomness, haphazardness. An internal consistency formula is known as KR-21 developed by Kuder and Richardson (Thorndike; 1988).

Table 2: KR-21 Reliability Coefficients of SSPE

Components Given in Different Years

Tests / Years	2010	2011	2012
Turkish	0,852	0,820	0,860
Hist/Geog/Psych	0,804	0,723	0,738
Math	0,815	0,715	0,733
Phys/Chem/Bio	0,657	0,622	0,567
English	0,940	0,963	0,969

Most of the reliabilities are quite high and all of them are satisfactory. Even the one which is 0.567 in natural sciences for the year 2012 is acceptable. This lower value can be explained by the attitude to sciences especially towards biology which is beyond our scope today.

Construct Validity

Another important test quality is construct validity. What should SSPE measure? What is SSPE really

measuring? The closer we get what is intended to be measured, the higher the construct validity will be. For example, I want to measure intelligence but I am measuring factual information; I want to measure creativity but I am actually measuring disobedience. For example, in Mathematics tests, there are implications of language, because you want to measure the ways of thinking, I mean the abstraction abilities of students, and you also have to measure the ability to understand verbal expressions. Figure 4 illustrates the construct validity.
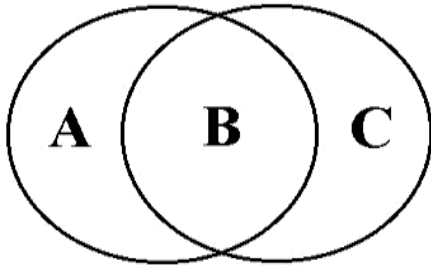
Figure 4: Relevancy Between What is Intended to be Measured and What is Really Measured

In Figure 4 area A+B is the set of competencies which are purported to be measured. Area C+B is the set of elements which have been measured in reality. In other words we have elements which couldn't have been measured although we wanted to (A), and there are some undesired leaks (C) which should not have been included. Area C is the extent to which we measure what we want to measure (construct validity). In real practice we can not claim that SSPE measures creativity. Creativity means originality, flexibility, and divergence. These competencies cannot be measured with multiple choice items which eventually converge upon predetermined keyed responses. We can neither say that SSPE measures the ability to synthesize and the ability to make deductions. Recently the learning outcomes, products of learning are described by the behaviors of the students as a part of Bologna process. This is something we borrowed from the US, and since 1964 we have been pursuing as well. We are looking at the level of education and trying to measure education based on the behavioral outputs of the students. And that is the basis on which Student Selection and Placement Center (SSPC) prepares the examinations. Therefore, as I said before, analysis-synthesis, comprehension, skills to find out a preset answers can be measured to some extent. Open ended questions such as "what can you do with a pencil" or "what can you do with a single brick" are divergent questions that require original answers can not be measured by this examination. We have to accept this. But luckily most of the competencies to be measured are correlated with the ones which cannot be measured. Table 4 displays a classification of examples of relevant and irrelevant measures in SSPE.

Table 4: Summative Analysis of Construct Validity in SSPE

	UNDESIRABLE	DESIRABLE
Dimensions have been measured	A: Income, gender, chance success	B: Knowledge, comprehension, Analysis
Dimensions could not have been measured	D: Weight, height, eye color	C: Creativity, synthesis, physical skills

Content validity

Content validity is the extent to which the items sampled in the test represents the total population of items in the content domain. Content domain has two dimensions: The construct or the sub-constructs such as comprehension, applications, analysis, creativity etc. constitute the firs dimension. Second one is the subject matter area such as physics, chemistry and sub-topics in any of those… Desired competencies can be plotted within the cells of the crosstabulation of these two dimensions. We can also set the competencies to be measured on this grid. It is practically impossible to include all of the items covering all of the performance levels and the whole domain of

subject matter area. Due to so many constraints limited number of questions can be asked in SSPE. First of all affective traits, psycho-motor skills, and some mental abilities such as creativity, synthesis cannot be measured within the practical limits of SSPE. Memory skills are not relevant to a selection test. Some higher level mental constructs (e.g. comprehension, application, analysis, evaluation etc.) which are converging to a keyed response are being tested. Subject matter areas covered in SSPE are the classical course content such as Turkish, maths, physical and social sciences, and humanities. Shortly we cannot say that the content validity of SSPE is high. As a matter of fact it is not supposed to be high. It is not possible to maximize all of the desirable attributes simultaneously. What is essential is to maximize the quality which is relevant to the main purpose. The main purpose of SSPE is not to appraise present competencies but to predict the future performance.

Curricular validity

A special kind of content validity is the curricular validity. To what extent is the content of SSPE compatible with the high school curriculum? How coherent is it with the curriculum to be set up for the future? Theoretically SSPE is neither bound with high school curriculum nor it can be in accordance with the gigantic curricula in higher education. Instead some potential aptitudes and/or attitudes can be measured. But when such tool constructs are used as the criterion of selection they turn out to be the aims. Some years ago the general ability batteries had been used in the university entrance examinations. Right after this practice private tutorial organizations (dersane) appeared all over the country to train for "general ability". Inequality among applicants increased and interest in curricular topics decreased. Since so many students cannot afford individualized training for non-school themes it is rational to keep SSPE content within the boundaries of high-school curriculum. Therefore items in SSPE must be constructed in such a way to measure higher level cognitive competencies relevant to the most recent curricular content. That's what is being done by SSPC rather inelegantly though.

Face validity

Face validity is the degree of acceptability of an exam by the people who are involved in it. No matter how reliable, valid and practical in essence an exam must look appropriate to its audience. Although SSPE is being criticized by everyone it is acknowledged by the whole society for some thirty years. Nowadays some keep accusing the practice of measuring a three-year high school education in three hours? First of all, the length of time of the evaluation process does not necessarily have to be proportional to the dimensions of the entity to be measured. A baby takes nine months to grow before birth, but its weight and size can be determined in seconds, its color and sex can be told immediately. Inflation develops during the whole year but you can evaluate it in a very short period of time. The preparation of a dish may take hours, but the taste is manifest in the first few bites. The tasting of the aged wine does not take years!

There is no rule such as the longer the period of the exam the more accurate the measurements will be. Measurement is reduction of data. The simpler and the shorter it is the more precise it can be. The validity and reliability of the measurement depends on the system and tools, and not on the duration. Secondly, SSPE is not a final exam or a curriculum evaluation for the high school education. The aim is not to measure the past performance, but to estimate the future. This is the most important feature that SSPE should have, and it is called predictive validity.

Predictive validity

Since the resources allocated to education are low we are obliged to select the most capable students in order to make the investment in tertiary education most efficient. This can be done through an examination or through another process if it had been possible. The statistical correlation between predictor (SSPE) and the criterion (e.g. GPA at the university) is a simple measure of "predictive validity". Figure 5 illustrates the correlational thinking graphically. The points which constitute the ellipsis are individual applicants. The abcissa and the ordinate of any point are the measures of SSPE score and GPA of a particular applicant respectively. .
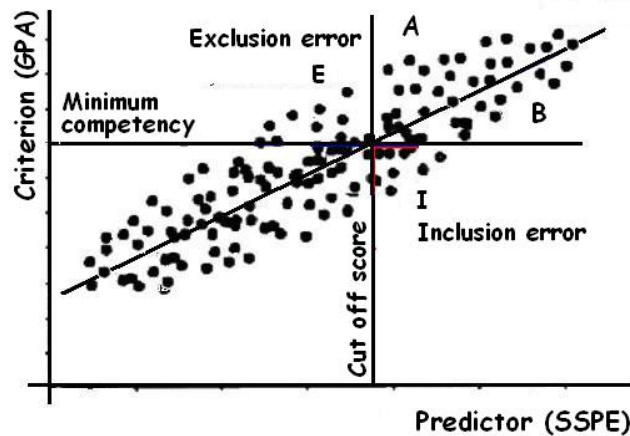
fFigure 5: Hypothetical Illustration of Predictive Validity of SSPE

(Turgut, 1975; Guilford&Fruchter, 1978)

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In practice cut off score is not predetermined by SSPC but it is the minimum score qualified for entrance to the last slot in the quota. The applicants below the "cut off score" are eliminated in SSPE. Therefore the GPA scores of those on the left side of the vertical line are not known. Area E are the students who would have been likely to be successful at the university but eliminated in SSPE. Therefore it represents the degree of exclusion error. Area I represents the inclusion error. Because these are the ones who were thought to have been successful in higher education but they disappointed SSPC. In area A there are the students who are more successful than expected; and in area B there are the ones who are less successful than expected. In case of perfect prediction the ellipsis collapses along the inclined line which means that the correlation is +1.00. In case of zero correlation prediction line disappears and elliptical distribution becomes a circular scattergram which indicates sheer randomness. Negative correlation implies significant prediction but in the opposite direction. There are many observations which has shown that SSPE predicts more significantly than expected. Due to the statistical nature of correlation coefficient such studies should be continuously carried out separately for each particular department.

School success of course is very important factor, but there is some evidence that it is not as predictive as SSPE. For instance, the best students of high-schools are not as successful as their schoolmates neither in SSPE nor at the university. We see that the correlation between SSPE and the college GPA is greater than the correlation between high-school GPA and the college GPA. So the high-school GPA is not a very good predictor even in the presence of SSPE. In the absence of SSPE as a sole criterion for entrance it is apt to corrupt abruptly.

Consequential validity

Consequential validity is the attribute expected to have been verified in a selection and placement program. Consequential validity can be inferred from the long term effects of the selection procedures. Most obvious evidence for the consequential validity is the contributions of graduates who had been selected years ago. There are many academicians among us. Many of them are younger than me. Administrators, experts, teachers had been selected by SSPE and had been educated in universities. Those people who are selected by this system have been educating the students, curing the patients, directing the institutions, managing the firms in Turkey for about thirty years. So, despite all of the downfalls, we can say that the Student Selection and Placement Centre is one of the most essential organizations for Turkish society.

CONCLUSION

The selection exam is an evaluation tool like any other tool, it can be improved. It can be made more efficient, more reliable, more valid (Ferrara, 2007). Most of the professionals in this field wish they were able to recommend a better system. But no one was able to come up with a better solution so far. Undoubtedly there are certain corrections that should be made in SSPE. First of all we must stop exploiting SSPE as if it were a Swiss knife. We are

trying to use SSPE to make every kind of correction in our educational system. We still hope to make up inequality in education by SSPE. We are trying to control secondary education by SSPE. Since these are the tasks impossible to be accomplished with examinations, SSPE is being judged very severely. SSPE must be maintained as a fair balance for justice rather than a jack of all trades.

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How Total Quality Management Can Support Stem Education

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ABSTRACT

In today's global competitive environment TQM has been acknowledged by industry and services to be a successful managerial strategy in continuously improving organizational performance. During the last 20 years there is a strong debate on whether TQM can be adopted in education. This paper summarizes past experiences in TQM implementation in higher education and discusses issues that need to be faced, in order to recognize the unique aspects of education. Many higher educational institutions have recognized the importance of quality in their field and have begun to apply TQM programs taking advantage of the anticipated benefits that TQM has to offer. STEM (Science, Technology, Engineering, and Mathematics) on the other hand is becoming a very popular concept in education, especially in the United States and the United Kingdom. This paper presents the way the main principles of TQM in higher education can serve the demands and objectives of STEM education.

Keywords: Quality, Total Quality Management, TQM, Higher Education, STEM Education

1 INTRODUCTION

While TQM is generally accepted in industry and service organizations as a successful managerial strategy, its role in higher education, is still under review and somewhat controversial. During the last 20 years there is a strong debate on whether TQM can be adopted in education. TQM's customer orientation creates problems when applied to universities. Specifically, the student, when viewed as a customer, does not fit the traditional classification of a customer, nor does it encompass the traditional properties of a customer.

Although problems exist in TQM in higher education, they have not significantly diminished its applicability, perhaps due to the given need for urgent change in this area. Financial problems and market pressures, which are challenging many higher education institutions, appear to give the main impetus for change. They leave institutions no alternative but to offer "higher quality at a lower cost" – a primary aim of TQM. As a result, higher education institutions have to develop methods to improve their quality. They have to embrace the concepts of TQM as a means of continually improving every aspect of their organizations.

The anticipated results are similar to those experienced in the manufacturing or service sectors. Namely, higher quality services are delivered both to internal and external customers, increased customer satisfaction, higher productivity, and improved student/ staff morale are achieved.

In the past years, several examples show that quality improvement has been one of the most characteristic features of higher education in many countries. By now, TQM has been accepted by many universities and colleges in the higher education world, in the USA, in the UK, in Sweden, in Finland, in India and other countries (Aly & Akpovi, 2001; Kleindorfer, 1994; Owlia & Aspinwall, 1997; Sahney *et al*, 2004; Swift, 1996; Wiklund *et al*, 2003).

Since the late 1990s several organizations in USA, like the National Science Foundation and the National Research Council have started expressing their concerns on the importance of improving undergraduate education in science, technology, engineering and mathematics (NSF, 1996, 1998). STEM, the acronym that stands for Science, Technology, Engineering, and Mathematics (http://www.stemedcoalition.org/) has become a push, started in the United States and spreading over Europe, to promote the value and understanding of the related disciplines and their essential role in addressing today's scientific, social and economic challenges. The urge arises from a perceived deficiency in the West of technically educated people, and thus a wide gap between the United States and developing countries such as China and India. STEM education has its own motives and emphases. Critical is the notion of life-long learning and individual unsupervised learning. These follow the fact that engineering and technologies are in a flux of rapid and frequent change. Unlike some traditional topics, STEM education must be reviewed and updated on a

continual basis. This is a common aspect for both TQM and STEM: the need for continuous improvement, which is the cornerstone of TQM is a prerequisite for STEM education. The TQM philosophy, in general, can serve the demands and goals of STEM education. TQM frameworks for education and the supportive tools and techniques applied can support and supplement on STEM goals and approaches to teaching and learning.

2 THE TQM APPROACH IN IMPROVING HIGHER EDUCATION

The applicability of TQM in higher education has been the debate for many years (Houston, 2007; Srikanthan & Dalrymple, 2003; Stensaasen, 1995; Venkatraman, 2007). As mentioned above, while TQM has been adopted by many organizations world-wide, its implementation in non-profit organizations, such as higher education institutions, presents more challenges and difficulties than those encountered in business organizations. What are the problems of implementing TQM in higher education? Who is the customer? Can we identify the products? Can we specify a customer-driven definition of quality and introduce a management quality culture based on the industrial model in the education environment? What is the role that the students play in their own learning? Can we control and measure processes related to teaching and learning? These are some of the question elaborated by many researchers in the recent years (Adrian et al, 1997; Harvey & Knight, 1996; Michael et al, 1997; Prendergast et al, 2001; Sahney et al, 2004; Sirvanci, 2004; Temponi, 2005; Wiklund et al, 2003; Venkatraman, 2007).

2.1   Concepts and Principles of TQM in Higher Education

Several TQM models exist, that present answers to the above questions. These models, based on the teachings of quality gurus, generally involve a number of "principles" or "essential" elements (Arcaro, 1995, Sahney et al, 2004/2). The main concepts and principles of TQM in higher education are presented below in more detail:

• *Focus on the customer.* Among the essential elements of TQM, customer focus is probably the most important, as reflected by the weight assigned to it by various quality award criteria (Sirvanci, 2004). Customer identification in a higher education institution seems to present more difficulties than are encountered in business organizations. For example in one model interpretation, parents and students could be perceived as external customers to the quality system, while in another, they might be perceived as internal customers. At the same time parents act as suppliers also, since they supply the system with "products" – their children- who are influenced respectively by the family environment. With the term *Internal Customers*, in a TQM program in an education institution, we refer to the parents, students, faculty, administration and staff of the institution. On the other hand, with the term *External Customers* we refer to society, businesses, future employers, families and other institutions that the students might continue their studies, and have an interest in the output of the institution's education process. There is a belief that some of these groups are more like stakeholders than customers and perhaps customers of secondary processes rather than customers of the primary process of education. There are also different viewpoints of different interest groups on who the customers are. For example, while most administrators tend to perceive students as the customers, faculty staff resent this metaphor as being too commercial.

Overall it is important to note that without a well-defined customer and customer focus, quality efforts may easily end up in failure. In TQM it is well known that Quality is defined by the customer; Quality is what the customer says it is. This is the reason, that the definition of the educational institution's customer is such an important and necessary task. Therefore, it is worth mentioning that, one of the critical steps in TQM implementation is the step of *customer identification*, where current and potential customers of the organization are determined.

Except of the importance of defining the *customer,* special attention should be paid to the duality of the students', as well as, the instructors' roles in the institution's quality system. Because of this duality of roles, a more intelligent application of TQM in higher education needs a clearer understanding of the fact that the teacher is not only a supplier as the student is not just a customer (Meirovich and Romar, 2006).

• *Commitment.* Top Management's leadership and commitment to quality is also one of the essential elements of TQM. Management's commitment is a prerequisite in order to start any quality initiative. Quality needs a change of culture and given that people resist to changes, management's commitment is an essential element for success. This commitment to quality has to be proven in practice, top leaders need to "walk the walk and talk the talk" in order to teach by example and direct involvement. Commitment to quality can also be proven by the allocation of sufficient resources and time. By the term "resources" we refer to people, tools, training and processes that will boost and promote quality. In education institutions the issue of leadership differs from the typical leadership in a business organization. Presidents, chancellors or deans do not enjoy ultimate authority as the CEOs of business organizations. Depending on the country, the administration and governance of the university might be shared. This leads to diffusion of authority and responsibility, and, as a result the top administration lacks the authority to undertake drastic measures and changes in higher education institutions. University presidents and chancellors, as leaders, can naturally set goals, organizational values and performance expectations. However, since they lack the necessary authority, it is difficult to deploy these values and goals through the layers of the higher education institutions

(Sirvanci, 2004).

• *Total involvement*. Another crucial element in TQM in education is the involvement of all interested parties, mentioned above, in the educational reform. Quality is the responsibility of every member of the organization rather than the responsibility of the "administration", or the equivalent of a quality department in industry. Changes are an outgrowth of faculty involvement rather than those of the university administration. It has to be noted that the involvement of *all* interested parties is a *crucial* element for success.

• *Measurements.* "You cannot improve what you cannot measure" is a well-known saying. Measurement against defined goals is a very important element for the successful implementation of a TQM program in an educational institution. In order to prove success, an institution must define quality objectives, measure the starting point of the quality effort, and use measurements for proving the attainment of improvements. A possible problem that may appear is to focus on problem solving, without, at the same time, measure the effectiveness of these efforts. Accomplishments need to be measured, and furthermore, communicated to the whole of the organization to support continuity in the quality improvement effort.

• *Continuous improvement.* Given the principle "Do something tomorrow better than you did it today", the goal of every TQM effort is continuous improvement. TQM is a continuous, unending process of improvement. The TQM program should be reviewed and evaluated on a regular basis to ensure goals are still focused and objectives are being met. In the continuous improvement process small improvements are important, as well as, great improvements. Faults and problems are opportunities for further improvement and in no case openings for criticism or judgments. In a TQM program everybody is responsible for preventing and solving problems. TQM is a philosophy of never ending improvements achievable only by people. Furthermore, continuous improvement in academic institutions means exploring the needs and expectations of the institutions' customer base, re-evaluating the effectiveness of programs and total quality initiatives (Temponi, 2005).

2.2   Implementation Models for TQM in Higher Education

For implementing TQM in higher education, several models exist that present answers to the above mentioned questions. Some of these models are based on:

1.   TQM principles and essential elements, described above

2.   The teachings of the famous quality gurus (such as Deming, Juran and Crosby), and

3.   The existing criteria of the quality awards, such as the Malcome Baldrige National Quality Award (MBNQA) in the USA, the European Quality Award (EQA) and the Deming Award in Japan.

In literature, there are also many examples of TQM models for higher education, which have been used by several universities in the United States that are considered to be the leaders of TQM in higher education. The examples of the Oregon State University, the Harvard University, the University of Wisconsin-Madison, the Babson College, Fox Valley Technical College, and the Northwest Missouri State University can be found in the paper presented by Michael et al. (1997). Also the implementation examples of two California public higher education systems are presented by Aly & Akpovi (2001) in their paper, as well as the implementation of TQM in the University of Pennsylvania (Kleindorfer, 1994). Another implementation framework for implementing TQM in higher education programs is presented by Venkatraman (2007).

As can be seen from many of the examples of implementing TQM in higher education, in general, the character of implementation is still limited to business-type operations in universities, such as business, finance and administrative services (Aly & Akpovi, 2001).

Nevertheless, TQM in Education can be seen by different perspectives and can be applied at three levels:

• The first level is to the administrative and management processes of an educational organization, with benefits in improved efficiency and lower costs.

• The second level is teaching TQM, the quality philosophy, methods and tools to students.

• The third level is total quality in the learning process. This has to do with a learning philosophy supported by a comprehensive tool kit and driven by students and staff in order to identify, analyze, and remove the barriers to learning (Hansen, 1993; Venkatraman, 2007).

Implementation of TQM can start at any level and progress further in other levels gradually.

It is important to keep in mind, that although, many models exist, models should serve as a basic foundation for colleges and universities to follow when they implement TQM in their own institution. The model that will be

chosen needs to be tailored to suit the institutions individual needs. In many cases, universities choose a combination of models in order to cover their special needs.

TQM was first introduced into higher education in the USA, followed by UK institutions. Based on a research contacted by Owlia and Aspinwall, it can be seen that in the USA, total quality practices seem to be more extensive and more widely accepted than in the UK. This can be explained by the more privatized and market-dominant nature of US higher education, in comparison with the more traditional UK universities, which usually rely on their national and international reputation (Owlia & Aspinwall, 1997).

2.3   Barriers and Obstacles to a Successful TQM Implementation

In order to have a successful implementation of a TQM program, there is a list of things to do and problems and pitfalls to take care of and avoid.

On the one hand, the things that one can do, in order to improve success chances are presented below:

• *Leadership.* Top leadership is the driving force behind success. The program leader must have top management's full support and teach by example. Top management's direct involvement is a key to the program's success.

- *Commitment to the principles of TQM.* It takes years in order to drive the principles of TQM through to all employees and students; emphasis on training can help. A basic ingredient for the success of the TQM effort is the commitment of the leadership of the academic organization.

    - *Customer focus.* As discussed above it is really important to clearly identify all customers in the educational quality system and focus on the primary customer of the process in question.

    - *Evaluation.* Measurement and evaluation efforts are needed in all aspects of the TQM effort. The introduction of fact-based management and measurement help in convincing about the efficacy of TQM.

    - *Resources.* It is very important to allocate sufficient resources and time to the quality effort. Caution has to be given in order not to underestimate the faculty and staff resources required to launch a TQM effort. TQM needs time, persistence and patience in order to succeed.

    - *Training.* As mentioned before training can make a great difference. Training for management and staff, academics and students, in order to understand the philosophy of TQM and acquire the necessary skills for teamworking.

    - *Empower.* A TQM program cannot be forced on "employees". Leadership must convince employees to accept the program and participate voluntarily. Employees must be empowered and willing to follow the TQM program and believe in its necessity. Note that students are also "employees" in a TQM program in education they also need to be empowered and persuaded.

    - *Quality Model.* Models are a good starting point, but no model is perfect for every university. The chosen model needs to be tailored to suit the individual needs of the institution.

    - *Starting Point.* Starting with a department where success will come more easily and quality improvements will be clearer to present is a good tactic. Usually administration is the first area to be subjected to quality and scientists only join the effort much later. Academia will be easier to follow once success is already proven. Nevertheless, there is a need to achieve faculty commitment to quality.

    - *Communication.* The issue of internal communication, but also communication outside the organization to the community, is very important for the success of the TQM effort. The dissemination of information helps getting all interested parties involved in the institutions success.

On the other hand, the things that one can avoid and take care of, so that the whole effort will not end in failure are presented below:

- Believe that TQM is a "quick fix" and anticipate benefits immediately. Impatience leads to disappointment.

- Not exhibit top management's commitment by example.

- Fail to adapt business principles correctly to an academic environment.

- Fail to address organization structure issues that create problems in focusing on a shared mission or common goal.

- Avoid empowering employees because leadership is unwilling to do so.

- Fail to estimate correctly the necessary resources (faculty and staff resources, time and capital).

- Not provide sufficient training and knowledge to all interested parties.

3 HOW CAN TQM SERVE THE GOALS OF STEM EDUCATION?

According to Labov et al. (2009) STEM education has many different learning goals. STEM goals include the following:

- Mastering a few major principles/concepts well and in depth (as distinct from procedural knowledge)

- Long-term retention of what is learned

- Building a mental framework that serves as a foundation for future learning

- Developing visualization competence including the ability to critique, interpret, construct, and connect with physical systems

- Developing the analytical skills and critical judgment needed to use scientific information to make informed decisions

- Understanding the nature of science

- Finding satisfaction in engaging with real-world issues that require knowledge of science.

The above mentioned goals are compatible and could easily be applied in parallel with TQM goals in Education, especially in the case that the educational organization decides to fully implement a TQM program and apply quality principles in the learning process (applying TQM in classroom). STEM education could benefit from the lessons learned from previous TQM program experiences and use the same tools and techniques in achieving its goals.

In fact, compared to general education, there seems to be more opportunities for STEM to benefit from TQM. This is due to three main observations: It is of paramount importance that STEM requires the commitment of top administration, STEM requires the positive changes in institutional culture towards the delivery and instruction of the technical content, and finally, STEM requires a fully competent faculty who can exceed the traditional boundaries of education.

More precisely, the ways that STEM can benefit from TQM are presented below, in relation with TQM main principles and lessons learned:

- *Continuous Improvement.*

First and foremost, STEM must embrace change, as rapid change is a given in technology and engineering. TQM's experiences in change management could prove to be very valuable for STEM, since TQM is also based in a change of culture which in turn must be communicated throughout the whole of the organization.

In this respect, the lessons of TQM, especially as they are viewed by high-technology firms where rapid change is a way of life, are most appropriate to STEM education. After all, STEM also involves the same rapidly changing technologies as those experienced in industry.

Furthermore, the above mentioned need, forces STEM education to be continuously reviewed and updated. As mentioned before, continuous improvement is a cornerstone of TQM, thus STEM can benefit from TQM experiences, as well as, the tools and techniques applied in TQM for achieving its goal.

- *Customer focus.*

Especially in technologies and engineering, STEM education must always keep the pulse of the customers who will use the "end product"; in this case, companies and institutions that will employ the graduates of STEM education. As the technologies change, so do the needs of the employing agencies. This in part comes from rather complicated dynamics. As technologies change, they are embraced by society. As a result, the way society uses or embraces certain technologies affect future demands. This in turn gives rise to changes in direction for STEM education. STEM education would be successful if the key principle of customer focus is emphasized and continual information feedback is provided to the educational institution. This could be done by formal visits, industrial review or steering, or by the direct involvement of the educational institutions in commercial and industrial activities. Tools and techniques used in TQM programs for continuous improvement and focusing on the customer can directly serve to the above need.

- *Leadership Commitment.*

It is important that educational leadership understand and be competent in STEM topics. It is no longer

acceptable that a professor teaches a technology which he is unable to produce. For example, it is insufficient for a professor to teach a programming language unless the professor has written a compiler for that language. This is a tall order that goes against the adage that "those who can, do, those who cannot, teach". Not having total commitment from top management, in this case, deans, chairpersons, and professors, will hamper the effectiveness of STEM education.

- *Total Involvement; No Quick Fix.*

TQM indicates that successful STEM education cannot be implemented by a simple change in curricula and the teaching environment. All elements of the system, including academic administration and the faculty must be committed as well as well rehearsed in the subject matter and philosophy of STEM. The principles of total involvement and teamwork that TQM promotes are definitely going to serve STEM goals.

This is a particularly delicate issue, as tenured faculty members are often resistant to change. The university as an institution is often seen as a conservative body where change is slow. Such prudence protects the institution from a mercurial stance. However, neither must change be placed on a slow track which will disallow the institution to miss the developments in technology. The key is to follow the rapid technological advancements while allowing time for the institutional processes to digest the fundamental modifications that are necessitated by STEM education.

All involved parties need to understand that STEM, like TQM, will be no quick fix, it needs time, patience and persistence to achieve success.

- *Change of Culture.*

STEM education would follow TQM in benefiting from a change of institutional culture and traditions. The members of a STEM education system should be committed to the goals of STEM and be competent in their respective fields. This requires a total commitment, that is, a partial implementation of STEM will be open to future difficulties and systemic failure.

Cultural changes in large institutions are usually slow, due to the low turnover in faculty and staff. Even student presence typically has a four year lifespan from being admitted to graduation. Nonetheless, cultural changes are necessary for the emphasis of STEM to be fully implemented.

4 CONCLUSIONS

Higher education institutions have been facing challenges for some time and are expected to face more in the future. In the new environment that higher education has entered quality plays an increasingly important role. Feigenbaum (1994) believes that "quality of education" is the key factor in "invisible" competition between countries since the quality of products and services is determined by the way that "managers, teachers, workers, engineers, and economists think, act and make decisions about quality. Higher education is being driven towards commercial competition imposed by economic forces (Owlia & Aspinwall, 1997). The new situation demands higher quality at lower costs, together with improved efficiency. Despite opinions that regard TQM as "the latest in a series of fads urged on higher education" it seems that there is solid reasoning behind introducing Total Quality philosophy in universities. TQM is seen by many as having enormous potential to respond to the challenges.

STEM education is a relatively new push in developed western societies. We argue that the successful implementation of STEM would greatly benefit from following the principles of TQM.

In particular, there is a need for top university administration to be committed to STEM education and undertake the necessary steps to establish the institutional culture within which the push for STEM could be successful. It should be understood that such a shift requires a long-term commitment from both the administration and the staff. The establishment of adequate performance measures, along with the periodic evaluation of the venture is a prerequisite for the success of the program. The elements and requirements associated with STEM education, in this respect, are very much aligned with TQM and its experience from similar cases in manufacturing and service industries.

Lastly, STEM education will benefit from competent faculty members who have actual experience outside the realm of teaching and research. This experience is necessary for the educators to more effectively take on the role of mentors, who can relate to actual field experiences, rather than to be mere tutors who are familiar with the topics but unable to provide further insights. Just as TQM promotes a competent workforce totally involved in the continuous improvement effort, faculty with a wide range of experiences is most desirable in STEM education.

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Lecturers' Perception On Teaching Evaluation: Selection Of Research Instruments

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ABSTRACT

Evaluations are used as a key measure of teaching quality by many higher learning institutions in lecturer performance processes. They can also be used by lecturers to inform reflections on teaching, and thus contribute to the development and enhancement of teaching, courses and student learning. However, there are limited studies have been done that focus on how lecturer perceive on teaching evaluation by students. Normally, questionnaire was used to conduct the study in a quantitative approach. In this paper, a summary of three questionnaires is layout showing the validity and reliability of its significant based on the content of these instruments. Other aspects such as the amount of items required in the questionnaire, the length of questionnaire, and the questionnaireresponse rates are also presented. By ensuring the quality of teaching and learning, this paper is intended to add up to the literature giving the best selection of research instruments of lecturer's perception on teaching evaluation, that best suits the criteria of the research instruments selected for this study.

Keywords: research instrument, teaching evaluation, questionnaire, survey tools

INTRODUCTION

There are number of methods or approaches used to evaluate teachers, learners and lecturers on their teaching instruction. Jackson (1998) had identified several different approaches to lecturer evaluation such as student evaluation, classroom observation, students' rating, student achievement, peer-rating, self-rating, teacher interview, parents' rating, competency tests, and indirect measures. The most famous and most frequently used is the student evaluation. Recent studies have indicated that formal student evaluation systems have been part of the higher education setting for decades and have prompted extensive discussion in the literature about their value and usefulness for teachers and learners (Smock & Crooks, 1973; McKeachie, 1990; Beran & Rokosh, 2009; Aleamoni, 1987; Nasser & Fresko; 2002, Arthur, 2009). Other research also says that student evaluation has been regularly used to improve teaching instruction, enhance the professional growth of the lecturer (Joshua, 1999).

Much discussion with regard to the implementation of student evaluation has focused on issues such as the usefulness of student feedback in improving the quality of instruction, teaching effectiveness and efficiency (Yusuf *et al.*, 2010; Harun *et al.*, 2011). However, the lecturers' opinion and perception on the student evaluation was neither enquired nordiscussed formally and this lead to a study to discover the lecturers' perception.

Most lecturers have conducted a student evaluation at some stage during their teaching careers. In order to look at the lecturers' perspective, previous studies apply both quantitative and qualitative approaches. Generally, a research instrument is used as a survey tool in the quantitative approach. Previously, there are a number of research instruments available with lots of different intentions and different objectives of the study. The purpose of this paper is to review the current literature of three research instruments used previously in studies that focus on how lecturer perceive on teaching evaluation by students. The study review its significant based on the content of these instruments includes the validity and reliability of the research instruments, the questionnaire length and response rate, and also the number of items required in the questionnaire.

The next sections of this paper are outlined as follows: The first section explores the existing research

instruments available in the literature. Next section presents the criteria selection of a research instruments. The final section summarizes the selection of a research instruments based on the criteria provided and presents recommendation for proposed research instrument.

THE EXISTING RESEARCH INSTRUMENTS

The following subsections discuss the three questionnaires that previously used in this type of studies. Each of the questionnaires contains the demographic section of the responders and it varies with each other based on research questions. These questionnaires were used in the higher learning institutions but in different research sites. Questionnaire 1 was used in the African region, where as Questionnaire 2 was distributed in New Zealand. Finally, the Questionnaire 3 was sent out in Malaysia.

Questionnaire 1: Lecturers Response to Student Evaluation of Teaching (LRSET)

This LRSETresearch instrument or questionnaire had been developed by Iyamu and Aduwa-Oglebaen (2005). It is a two-page questionnaire and contained of 20 items to test the hypotheses. The first 10 items were on the general need for student evaluation; the next 5 items were on formative purposes; and the last 5 items were on summative purposes on student evaluation. The questionnaire had a four-point Likert scale items based on a scale of Strongly Agree, Agree, Disagree and Strongly Disagree and were weighted 4, 3, 2 and 1 respectively. These items were listed in the Table 1.

Table 1: LRSET Questionnaire items

No.	Items
1	Students should evaluate their lecturers.
2	Maturity of university students qualifies them to evaluate their lecturers.
3	Students possess good value-judgment to evaluate their lecturers.
4	Lecturers will be more prepared for their teaching if they know that their students will evaluate them.
5	Lecturers will be more punctual to class if they know that their students will evaluate them.
6	Lecturer-student relationships will be improved if they know that their students will evaluate them.
7	Lecturers will be more dedicated to their job.
8	Lecturers will be more disciplined generally.
9	Feedback on student evaluation helps lecturers to improve on their teaching.
10	Lecturers will be more innovative in their teaching.
11	Lecturers will be more transparent to the students.
12	Results of student evaluation are needed to improve classroom instruction
13	Results of student evaluation are used to improve students' learning.

14	Results of student evaluation can be used to assess the professional needs of lecturers.
15	Student evaluation reports allow for self-reflection.
16	Results of student evaluation are needed for administrative decisions.
17	Student evaluation results are used for promotion of lecturers.
18	Such results are needed for salary increase for lecturers.
19	Student evaluation results are needed to select the best teachers for award in the faculty.
20	There is the need for student evaluation of lecturers yearly.

This questionnaire has been implemented at four institution of higher education, namely University of Benin, Benin City, Nigeria (Iyamu & Aduwa-Oglebaen, 2005), Cross River University of Technology, Nigeria (Idaka, Joshua, & Kritsonis, 2006), University of Ilorin, Nigeria (Yusuf *et al.*, 2010), and Walter Sisulu University, Republic of South Africa (Machingambi & Wadesango, 2011). It had been tested and improved with a Cronbach's Alpha reliability coefficient of 0.61 by Iyamu and Aduwa-Oglebaen (2005), and also 0.63 by Idaka, Joshua, and Kritsonis (2006).

In addition, according to Yusuf *et al.* (2010), this questionnaire instrument had also been improved and content validated by three lecturers from University of Ilorin, Ilorin, Nigeria. The test-retest procedure was used twice to determine the reliability of the instrument to university lecturers. The scores were analyzed using the Pearson Product Moment correlation coefficient and this yielded a coefficient of internal consistency of 0.59. The instrument was also vetted by three experts in educational research, measurement and evaluation, and psychology for face and content validities from Cross River University of Technology, Nigeria (Idaka, Joshua, & Kritsonis, 2006).

Questionnaire 2: Teachers' Perception on Student Evaluation Survey

Deaker *et al.* (2010) have developed a twelve-page survey so called Teachers' Perception on Student Evaluation Survey. This survey consists of 37 items (with sub items included) using a five-point Likert scale and each of them contains the comments box. The items of this survey were listed in Table 2. The first three items were using a Yes/No answer and the last two items were open-ended questions. The survey explored the current practicesin the first five items and the rest of the items explored the perceptions of the data and influence on practice.

Table 2: Teachers' Perception on Student Evaluation survey items

No.	Items
1	Have you ever run student evaluations using the centralized system of evaluation?
2	Please identify why you use student evaluations: • To get feedback on my students' learning experiences • To provide feedback to my students • To report on quality matters to relevant internal and external bodies • Because it is required by my school/institution

- For my own professional development
- For my promotion application
- For my salary review application
- To help with course refinement/development

3 Do you ever communicate with students about their feedback from student evaluations?

4 When you receive the results from your student evaluations do you:

- Actively look for feedback about teaching and assessment?
- Seek assistance with interpreting the results (e.g. colleagues/Head of School/Organizational Research Officer/EDC/mentor etc)? Discuss the results with colleagues/teaching team?
- Compare the data with previous evaluations?
- Provide students with feedback on the results?
- Read the open question comments made by the students?
- Spend time going over the data and responses?

5 Do you show your students you have taken account of their feedback from the evaluations through:

- School communication channels such as notice boards, Moodle, email lists, etc
- Course refinements/improvements
- Informal discussion with students
- The course outline

6 To what extent do your reasons for using student evaluations influence your teaching decisions?

7 To what extent does Otago Polytechnic's use of student evaluation data influence your teaching decisions?

8 My course design refinements are influenced by student evaluation results:

9 My willingness to try new teaching approaches is constrained by the possible negative effects on my student evaluations:

10 Do you personally consider it worthwhile to gather student evaluation data about teaching and courses?

11 How effective is your Institution's centralized evaluation system in gathering meaningful student evaluation data for you?

12 If you were able to decide on the future of student evaluation at your Institution, what would be your decision and why?

13 Do you have any other comments to make about student evaluation of teaching/courses?

This survey was implemented at three institution of higher education in New Zealand namely University of Otago (UO), University of Waikato (WU) and Otago Polytechnics (OP). According to the Stein *et al.* (2012), the survey

had gone through a pilot study to 45 staff from respected institutions as mentioned above and number of changes was made from their feedback until the survey ended up with the final version. However, there is no evidence stated that the questionnaire has been analyzed and validated showing the reliability of the survey.

Questionnaire 3: Lecturers' Perception on Student Evaluation

This three-page questionnaire was developed by Harun *et al.* (2011) and consists of 54 itemswith 5 point of Likert scale, 1 being totally disagree to 5 being totally agree, and the last two items were open-ended questions. These items as listed in Table 3 and were alienated into eight clusters; a) Academic staff appraisal in general (7 items), b) The lecture method (4 items), c) What students expect from a lecture or lecturer (5 items), d) Student ratings in general (12 items), e) Negative aspects of present format (8 items), f) The summary report (6 items), g) The 'written-in' comments (6 items), and h) Positive aspects of present format (6 items).

Table 3: Lecturers' Perception on Student Evaluation survey items

No.	Items
1	The performance of academic staff should be appraised in a more regular and systematic way.
2	Any appraisal system which focused on monitoring individual performance with the aim of improving efficiency would be welcomed.
3	Staff appraisal involves the recognition that an individual is doing an important and worthwhile job.
4	The aim of any system of staff appraisal must be for the improvement of their performance.
5	Consultation and training resources should be provided for lecturers seeking to improve their teaching.
6	Good teaching is central to the maintenance of academic standards.
7	Evaluation of teaching must be broadened to include measurements other than student ratings of lectures.
8	The lecture method is an efficient way of transmitting factual information.
9	Lecturers encourage students to think for themselves.
10	Little active learning occurs during most lectures.
11	Students learn more from reviewing their notes than from making them.
12	Students expect all lecturers to be able to lecture well.
13	Students think the lecturer should provide "all you need to know for passing the exams".
14	The lecturer should make the subject interesting for the students to enjoy attending
15	Students are most impressed by the lecturer who can present the main

points in ways which are easy to grasp.

16	Students are unimpressed by the lecturer who merely reads from notes.
17	Students have the right to make judgments about the quality of teaching.
18	Student ratings have a useful place as a form of consumer control.
19	Student ratings are influenced more by the lecturer than by the subject.
20	The lecture content has little effect on the student ratings.
21	Student ratings are greatly influenced by the personal 'charisma' of the lecturer.
22	Student ratings are more applicable for the younger, less – experienced members of staff.
23	Student ratings can provide information on only the most trivial aspects of teaching.
24	I am in favour of student evaluation of teaching, provided it is offered as a service which I can use if I wish.
25	Student ratings can provide useful feedback to lecturers about their teaching.
26	Students are not competent to make value judgments about quality of the subject and/or the lecturer.
27	There are important aspects of teaching which cannot be assessed by simply rating statements on a '1...5' scale.
28	Using student ratings as a measure of teaching effectiveness can be as misleading as using 'best-seller' lists as a measure of literary excellence.
29	The fact that students were able to respond anonymously encouraged silly and amusing responses.
30	The time spent filling in the student evaluation forms could have been used for other, more important, purposes.
31	It is unrealistic to make value judgments based on such small samples of student opinion.
32	Students' opinions can be unfairly biased by a 'few extremists'.
33	Over frequent use of these student evaluation forms is counterproductive.
34	The processing of the completed student evaluation forms took too long.
35	The issue and collection of the student evaluation forms caused a major upheaval.
36	Not all the statements on the student evaluation form applied to my lectures.
37	The summary report identified some problem areas.

38	The summary report was difficult to understand.
39	The 'feedback' of information in the summary report was insufficient.
40	The summary report confirmed my own impressions.
41	The pattern of student responses is often inconsistent.
42	Some items on the evaluation form need to be revised.
43	The 'written-in' comments from students were helpful.
44	Students' comments often highlighted basic problems of communication of information from lecturer to students.
45	The 'written-in' comments from students were, for me, the best source of information.
46	Only the adverse 'written-in' comments were returned to the lecturer.
47	Students make very constructive suggestions as to how the teaching can be improved.
48	Lecturers need to pay attention to students' opinion.
49	I am basically satisfied with the evaluation form used for student evaluation.
50	I welcome the feedback of information from students.
51	The feedback from students has helped me to improve my teaching.
52	Constructive criticism by students can be most helpful.
53	The students' perception of a lecturer's performance is accurate.
54	Student ratings are a good measure of overall teaching performance.
55	What further comments do you have in relation to any of the questions above or any other aspects of the student evaluation of teaching?
56	The number of students who do the evaluation is very low. Any suggestion how to overcome this problem?

This questionnaire items were adapted andmodified from Su (1995) in Harun *et al.* (2011), to suit the objectives of their study.Upon fulfilling the reliability and validity requirement, this questionnaire has been tested the coefficient of reliability with Cronbach's alpha value of 0.828. Moreover, they mentioned that a total of 30 questionnaires were distributed amongst the lecturers for the pilot study. At current state, this questionnaire has only been tested to one university in Malaysia that is Universiti Kuala Lumpur (UniKL).

THE CRITERIA OF THE RESEARCH INSTRUMENT

Many institutions have well established systems of student evaluations with varying degrees of compulsion but are they a valuable method of feedback for lecturers, and does this feedback lead to improved teaching and therefore improved student learning? Therefore, the author currentlyis conducting a study on how lecturers' perceive on students evaluation in teaching. This case study took place at a public university in Malaysia and uses both

quantitative and qualitative approach.

In the quantitative method, the author used an established research instruments or questionnaire to conduct the survey. However, there are number of questionnaires existed in the literature for similar type of this particular study. Thus, selecting a good questionnaire requires several criteria to be considered. According to Malmgreen (2005), a research instrument must be assessed prior to use for both validity and reliability. An evidence of content validation studies and reported reliability statistics from published studies that have used the instrument are mostly required.

To demonstrate the validity of an existing research instrument, there are several different types ofmethod to be used. One of the accepted methods suggested by Rattray and Jones (2007) is using content validity (or face validity) which refers to "expert opinion concerning whether the scale items representthe proposed domains or concepts the questionnaire is intended to measure" (p.238). As suggested and recommended by Lynn (1986), the questionnaire need to be send for content validity to content experts – at least two and up to twenty – to review for relevance and clarity.

Secondly, an established research instrument requires demonstrating the reliability which refers to the repeatability,stability or internal consistency of a questionnaire (Jack &Clarke, 1998). According to Rattray and Jones (2007), one of the most common ways to demonstrate this uses the Cronbach's alpha statistic. It is a reliability test that measures the internal consistency and stability of the multi-item scales based on the correlation between variables (Tan, 2007). As stated by George and Mallery (2003), a value of Cronbach's alpha>0.7 is acceptable for the entire questionnaire. However, according to Nunnally (1978), an alpha coefficient of >0.60 is considered adequate for social science research.

Other items to be considered to adopt an existing research instrument are length of the questionnaire, questionnaire response rates, and number of items in the questionnaire. A study by Bogen (1996) concluded that a shorter the questionnaire (<3 pages), the more likely having a high response rate. In other words, the length of the questionnaire which can be seen by the respondents, might instruments with more items get lower returns (Heberlein & Baumgartner, 1978). According to QueryCAT (2013), the items should not be more than fifty questions on a questionnaire with an answering time no more than 15-20 minutes for a typical work environment.

CONCLUSION

Based on the criteria selection of a research instruments listed in the second section of this paper, the best research instrument that suits the needs and criteria in the research site is the LRSET. This questionnaire is a two-page survey having the shortest questionnaire listed above and has 20 itemto answer the research questions with approximately less than 10 minutes response rates (assuming people can go through a survey in about 3-4 questions per minute). LRSET also has been content validated by six experts from two universities, and it was demonstrated twice with a Cronbach's alpha reliability coefficient of 0.61 and another is 0.63. Therefore, LRSET is suitable and appropriate research instrument to be used for the type of study based on requirement meets of the criteria provided. It will be utilized in the implementation of this study, as well as considerations for other researchers with different research context.

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Problems Encountered In Educating Qualified Workforce In Vocational High Schools And Solution Seeking

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ABSTRACT

In this century, in which technological development proceeds, it is seen that manpower to work within production sector can not satisfy the expectations of sector. As a result, competition opportunities of companies decrease and their need in educated work force increases that much. The purpose of this study is to research the reasons why qualified work force to satisfy expectations of production sector can not be trained in vocational schools in Turkey and to propose a solution. The machines working with advanced technology are not used efficiently and safely in production sector; this situation poses an obstacle before the aim of providing high quality product at low cost. The resolution is that trained and qualified employees should use the machines within production sector and then quality education should be provided in vocational high schools.

Keywords: Vocational Schools, Skilled Manpower, Quality Education

1. INTRODUCTION

With the developing technology in the manufacturing sector profit margins decreased and, at the same rate, competition increased. Firms aim to do most work with least people by minimizing the skilled manpower investment which is the most important cost to fight with increased competitive conditions. Understanding of education which can meet expectations manufacturing sector is not given in junior technical college of our country. Being a serious harmony problems between equipment of vocational colleges, educational staff, academics and developing technology is the one of the most important reason.

In our day, there is an intense competition in global market. It's gaining more and more importance to grow man power has the quality to meet expectations of business world in this competition. If education system will fail at growing qualified man power, the price for this failure shall be paid either by enterprises thereby training their available employees with a very high cost, or by society thereby standing for purchasing of goods and services of poor quality (Dahil and Karabulut, 2013).

In the current economic conditions and the labor market becoming increasingly competitive, people must change their job, constantly renew and develop their abilities when they want or has to all over their work life. Thus, Programs of vocational and technical education institutions should give broad and transferable skills to students besides the occupation-specific skills.

Education; it is systematic progress which provides specific improvements and developments on people's thinking, attitudes and behaviors, their lives in the direction of predetermined aims (Barutçugil, 2002). Teaching can be accepted as regulation of learning environment for the realization of learning. Environment, known not only as places of education, but also methods, tools and materials used for transferring the knowledge and guiding the work of students (Gelişli, 2007). Five types of teaching for different purposes. These direct training, remedial education, learning skills facilitation, social skills facilitation and idea width (Hartley, 2007). Especially in industrialized countries, education in today's social structure is examined as preparation of human resources or workforce in the context of societal needs. Educational technology and teaching technology terminologies are often considered as equivalent expressions. Recognizing the distinction between each other as terminology is very important. Many proficient think that educational technology is comprehensive concept which is used in every aspect of education initiatives but learning technology is not a comprehensive concept which is used for using strategies for a particular purpose and specifying teaching and learning process through the media of communication (Donald, 2008). In general the most important natural resources for the development of a country is manpower. It is fundamental to provide high-level production by taking advantage of manpower and natural resources as required. This is possible only through

education. Taking advantage of the natural resources in the best way depends on training of manpower about this issue. The purpose of vocational and technical education is to provide needed basic behaviors for an individual to get a job and progress in that area (Sezgin, 2000). The fact of having a profession which has an important place in people's social lives and practicing the best profession through education effect the life of humans and societies. When you from this point, it is obviously seen that vocational and technical education have an important part in lives of people and communities (Kazu and Demirli, 2004). If the education system does not adapt to the developments in the industry in time, a disconnection between the two systems occurs and the skills imparted in the educational system is becoming invalid in the industry (Ulusoy, 1993). Consistent and attentive content should be regulated with academic standards and the relevant technical knowledge and required skills should be prepared in applicable expertise field for further education and professional life (Donnelly, 2008). To capture contemporary technology, even to give it direct, it is required to give talent of creativity, problem solving and using information along with the handcraft should be taught. Success of vocational education which prepares individuals to life and business area depends on effectiveness and efficiency of cooperation of industry and school. By reflecting this collaboration with the contemporary technological changes and developments to the vocational training programs as soon as possible, there will be an education according to requirements and needs of business life (Kaya, 2005). Vocational and technical education which generally aims to meet the intermediate members of the industry and business area exhibits a dynamic structure to respond the need of rapidly changing technological knowledge, production methods and industry (Ercin, 2004).

In a study conducted within the scope of this article, source of the current problems is found by analyzing the situation of Vocational and Technical Education system at the tertiary level. At the end of the study, suggestions contributing to the solution of the problem come up and information about how these recommendations should be implemented are given.

2. VOCATIONAL AND TECHNICAL EDUCATION PROCESS

2.1 The Historical Development

Vocational education in pre-industrial societies was walking with a structure of master-apprentice relationship rather than a formal education (Şahin and Fındık, 2008). Until the 18 century, vocational training was carried out as Ahilik in Selçuklu period, as the Guild organization in the Ottoman period in a system based on conventional methods. In this structure, children given over to a master by mothers and fathers to learn the profession firstly promote to headworker and later mastery in a period of time working here. In addition, large organizations bound to the state were training qualified personnel they needed by opening courses and schools (Semiz and Kuş, 2004). While principles of professional qualification were determined and at the same time it was based on the protection of commercial morality. With the effect of industrial revolution on Turkish society, vocational education must be carried out in school discipline (http://etogm.meb.gov.tr).

In accordance with the directives of Atatürk after the Republic, work of more modern Vocational and Technical Education was accelerated. In 1937 year, provinces were divided into nine region with Law No. 1867 and in every region, art schools which were managed and funded by provinces was activated. Thus, art schools were turned into "Regional Art Schools". (http://etogm.meb.gov.tr).

2.2 Qualified workforce and Vocational Technical Education

In sectorial areas of developed countries, while the need of skilled manpower can respond to the expectations and demands of businesses, many of the developing and underdeveloped countries has a serious problem to educate human resources which they need. One of the most important indicator of the nature and impact of human resources is country's productivity figures. When you look at the statistics regarding the efficiency, Turkey has not got a good performance about this topic. For example, while China has increased its efficiency 5 times increasing in the last 20 years, Turkey has stagnated (Saygılı, Cihan, Yavan, 2006).

2.3 The Current State

Vocational education has a structure in secondary, undergraduate and graduate level. In higher education, vocational technical education is given by two-year Vocational Schools and four-year vocational and technical education faculties. Two-year vocational schools are established to ensure needs of intermediate member (Technician) which is needed by industry. The main purpose of the four-year vocational and technical education faculties is to contribute the skilled manpower in the manufacturing and service sectors of businesses with meeting the needs of the teachers to vocational secondary schools.

Vocational schools is one of the most important steps of the 'Vocational and Technical Education System'. Vocational Schools has been established to train qualified interim person who has sufficient knowledge and skills for industry, trade and services sectors. Vocational schools fill the gap between Vocational and Technical Education

institutions providing education at the undergraduate level and employment areas targeted by secondary institutions. As shown in Table 1, vocational and technical education programs are implemented in 48 fields and 247 departments in our country according to 2012 data of Higher Education Council. Based on the same data, 777,741 students studying in 777 in Vocational High School in Turkey and 14,985 faculty members are serving. These figures Show that the number of vocational schools and consequently the number of students increased 2times in the last 5 years. Number of students is 51.9 per instructor. This number is about 2.5 times of all higher education average.

Table 1. Number of Vocatıonal Training School & Undergraduate Students

	INSTITUTIONS		NEW ADMISSIONS	TOTAL NUMBER OF STUDENTS	TEACHING STAFF
	NAME	NUMBER			
TOTAL FOR TURKEY	TWO - YEAR VOCATIONAL TRAINING SCHOOLS	777	290945	777741	14985
TOTAL FOR THE UNIVERSITIES	TWO - YEAR VOCATIONAL TRAINING SCHOOLS	745	279924	755789	13197
TOTAL FOR THE THE OTHER INSTITUTIONS	TWO - YEAR VOCATIONAL TRAINING SCHOOLS	32	11021	21952	1788

The majority of the students in vocational colleges are provided by vocational and technical high schools. According to statistics from the year 2012, 70% of students in vocational colleges come from vocational and technical high schools. While the number of the students who enrolled to vocational colleges was 190291 in 2008, it was 290945 in 2013. Although the number of the students in vocational colleges increased, infrastructure, the physical space, equipment and staff needs of these institutions were not met at the same rate. So, application decreased quality of vocational colleges' education and the system was paralyzed. Because the students was not taken in vocational colleges basing on serious and scientific criteria, vocational colleges was not the education center which meet the need of qualified people to labor market and turned into the last education stop of the unsuccessful students. Despite all this negativity, current education is hindered because existing workshop and laboratory technology is mostly away from to meet the needs of today's technology. Vocational school's graduates who does not meet the need of technology school's graduates who does not meet the need of technology become not meeting the need of sector. Graduates try to get technologically advanced professional skills by the help of courses because they can't get it from the school. Not meeting the rising need of teacher with the enactment of the passing without examination system is one of the important reason which causes decreasing of education quality. Problem of teaching staff lived in vocational schools is revealed by the figures. According to data from 2005-2006, while there are 68.07 students per instructor in vocational schools in our country, it is 5 in Germany, 9 in Japan, 10 in Belgium (Eşme, 2007).

As a result of the phasing out of the system to pass without examination of student and faculty data to pass without examination after two years have taken their final form and after the passage of examination system by looking at the number of students to be assessed in a more tangible.

According to the work conducted by Ministry of National Education, Higher Education, Ministry of Development and the Union of Chambers and Commodity Exchanges of Turkey together, the number of vocational colleges will be decreased. A part of this schools will be closed, some will be converted into some vocational schools, and others will be merged. Thus, the number of vocational schools showing an excessive rise in recent years will be controlled.

The level of the quality of labor in Middle and Eastern European countries is higher than in Turkey. This situation shows that Turkey has a serious problem to train qualified labor (CEUT, 2004). Educating qualified manpower which can realize the social development is the duty of the education system in a large extent. While education system is carrying out this duty, it sees students as a productive citizen and prepares them to community life, profession world or further education. When indicators are examined, it is seen that the importance is given to

vocational education which train qualified labor in EU countries, in developed countries like the U.S. and Japan. Both students and public administration doesn't show enough interest to Vocational Training Institutions in Turkey where the industry is developing and this is why there is "Qualified person" person.

3. VOCATIONAL AND TECHNICAL EDUCATION IN TURKEY WITH DATA IN THE DEFINITION OF THE PROBLEM

Data in figure 1 shows the professional competency assessments of graduates with vocational education who are working manufacturing and service sectors businesses. Many employers find professional knowledge, skills, attitudes and work habits of graduates inadequate. As a result of the inadequate education of students who are coming from this negativity in technical education, they must produce with educated people instead of skilled labor. Because skilled manpower wanted by Professional organizations is based on "now knowing people but a person who can do" when you look at the table, vocational colleges which must be revised according to the conditions face to serious problems.
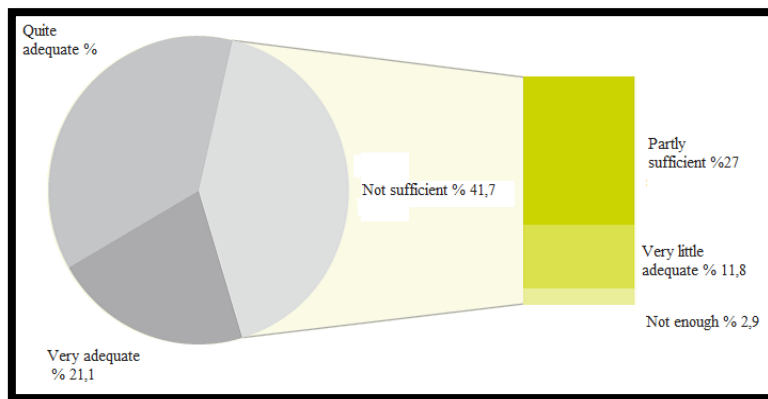

Figure 1. Finding condition adequate for the work which includes career information

(Ministry of Education Educational Research and Development Department-2010)

Vocational and technical education given in current vocational colleges does not graduate qualified person to meet the labor market and so enterprises of manufacturing and service sector must train the graduates again. This is a serious problem for small and medium-sized enterprises who uses new production technology and need fort he qualified person. Improving the quality of vocational and technical education has a serious place in National Employment Strategy Paper. One of them is on the development of education-employment relationship. Works in this field are started to be applied especially with the start of Specialized Vocational Training Centers (KOÇ, ERI). Machinery equipment and hardware needs for implementation of vocational and technical education programs in secondary education are met to a great extent with this application, vocational training back of manufacturing sector form ant years, becomes stronger. Because the students are educated with the same technology which is used in industries, they are able to meet the need of qualified labor after they graduate from vocational colleges. Employment and Training Relations Strengthening Action Plan that is prepared by the collaboration of Ministry of Education, Labour and Social Security, Ministry of Industry and Trade, Higher Education board, Institution of Vocational Qualifications and Turkey Job Institution and finalized by taking opinions of relevant civil society organizations, labor, employers' organizations, professional organizations published in July 2010. Ministries, public institutions and organizations and the private sector are moving together within 60 action plan (KOÇ, ERI).

3.1 Problems Arising From Vocational Guidance

Orientation and attention to vocational schools in our country is less than orientation and attention to vocational schools in developed countries. Harmony between interest and the ability of individuals and specifications required by the work in training the qualified labor is the most important factor on practice of individual's work motivation and profession. Individual himself, interests and abilities, the qualifications required by the job must be very good examined to choose the right job. Even though vocational guidance is being done from secondary in our country, many shortcomings and malfunctions occur of vocational guidance services and promotion conferences in schools are inadequate to choice appropriate career. Needs of social and economic conditions that we are in, family's request, income levels and environmental factors are determinative, rather than individual's ability in vocational guidance. Families who want their children to enter university insist on having a university degree rather than getting vocation. When the lack of the current examination system and guidance service is added to this situation, a conscious

vocational guidance can not be done and the problem of vocational education is relocated from secondary to college.

3.2 *Problems Arising From Educational Curriculum*

Programs whose names are different but the content is same in both secondary and colleges are opened. This situation reveal the programs which are each other again. Especially in higher education, programs which seems disciplines of different faculties are opened. This situation prevents efficient use of resources and causes graduates to gain different qualifications (Fer, 2000). Sufficient qualified manpower needs could not be identified in our country and as a result, more employment of labor occurs in local level.

3.3 The Problems Experienced with the Manufacturing and Service Sectors

Because of the mismatch between vocational schools and enterprises, education of qualified manpower responding the expectations of businesses can not be done. This incompatibility is one the fundamental cause listlessness to vocational and technical education in both secondary and colleges level. Determination of this question has a very big importance for both eliminating the problem of skilled manpower and solution of problems. The efficiency of vocational and technical education institutions is proportional with the suitability in terms of quality and quantity with demands of trained workforce and labor market. With the advancing technology, demands of enterprises show a continuous change and expectations to labor change. There is big serious problem between organizations giving vocational education and businesses especially in applications. Educational institutions do not follow real sector, real sector does not take educational institutions into them directly. The main reason for this is that training of professional staff with the needs of industry is not created by regional needs are taking into account. Because vocational education is an expensive and a long-term education, the supply-demand balance requires to be handled carefully. All these discrepancies happened with the manufacturing and service sectors bring employment problem together.

3.4 The Adaptation Problems Inadequate Infrastructure and Developing Technology

Vocational and technical education institutions providing secondary and tertiary education in our country struggle very big problems to provide professional equipment required both for keeping pace with infrastructure and evolving technology. Vocational and technical education is expensive and at the same time long-term and risk-based education. Vocational education institutions are required to follow progressing technology. The modernization of vocational and technical education is being done especially with the projects developed by using European Union funds recently. Moreover, resources are transferred to vocational and technical training by using the resources of the general budget. The part shared to education from general budget in Turkey is the half of the shared part in OECD countries and this emerges that sources transferred are inadequate. According to the data's from 2006, average part shared to the education from public in OECD countries is %5,9 while it is %3,7 in our country (OECD, 2006). Vocational schools are excluded from campus area by the university. Thus, this causes that vocational schools are seen separate from vocational colleges and prevents students to feel as a university student.

4. CONCLUSİON

Vocational and technical education faces with very serious problems at the level of vocational schools. The current status of vocational education have been identified and problems tried to be determined and solutions are tried to be found. The rate of vocational and technical training to all secondary is %35 in developed counties but it is %70 in our country.

As well as the large number of students and lack of academic staff in vocational and technical education institutions, the most important problem is lack of infrastructure, technological equipment, laboratories and workshops. Furthermore, these are problems that students from vocational schools have not got the capacity to get adequate professional knowledge and skills, coming from areas with insufficient economically and socially status, their expectations and goals from profession do not overlap with evolving technology, vocational schools do not have the education programs meeting employment expectation. İt is not possible to meet the expectations of real sector with these deficiencies and defects of Vocational and technical education institutions. As a result of that Vocational and technical education institutions has a physical structure away from business and at the same time businesses can not create enough communication and relationships in terms of time and economic, required manpower profile can not be created for both educational institutions and business. When role in creating skilled manpower of the purpose of vocational education colleges is considered, graduated students should lecturer who have knowledge and skills to educate them and practice them and show students machinery and equipment for industry when students need application and to take an active role in business. For the realization of that teaching staff providing training in vocational colleges are required to have originated educational background not engineering background. As result of the National Education Policy Implemented in recent years, the number of students in vocational schools significantly

decreased and Number of Faculty of Technical Education and Faculty of Technology and vocational colleges increased. When the structure of Turkey's skilled labor force and productivity viewed, success in vocational and technical education is revealed. The Eastern European countries and Colombia are located on Turkey in the ranking of skilled labor. Public and private sector apathy to vocational and technical education institutions, the places where skilled labor force are educated, opening vocational school in every county by making national education policies internal political material and attempting to appoint teaching staff with non- adequate training and experience in these institutions are important results of this conclusion. In addition to these, that local expectations are based not on country's economy and productivity but on personal interests and passing this in front of the strategies of vocational and technical education institutions causes that problem of the inter professional pointless competition, conflict will grow instead of decrease. That vocational schools are opened together with lack of unplanned and infrastructure outside of vocational colleges and also opened in private universities led to labor graduations which is far below as quality but above as number of market's expectations. It is evidently seen that students coming to vocational schools are in a trend to have a diploma rather than having a specific aim. Since private universities increased and these universities does not have a disciplined and practical education, tending towards these institutions rather than state institutions has increased. Quotas in state-owned vocational schools has become substantially vacant. Because the students coming to vocational colleges can not find the expectations from the environment of university and social life, they has a serious problem in understanding the importance of their profession and school life. Student who are educated in province vocational schools complete their education by living in province and doing daily commute to solve their problems in their social life and spend time in this environment. When this situation's economic and physical conditions are forced, students can not have sufficient knowledge and skills for the future. So, students prefer going to private universities which are more relax and have approximately the same economic costs. Because the same problem applies to faculty members who work in the town, vocational schools become a place where the individuals want to get rid of neighborhood and family pressure. Because recruitment of teaching staff in vocational schools is not applied according to objective criteria, high school education which is very remote from application logic is given by people not having sufficient knowledge and skills and just striving for social status.

5. RECOMMENDATIONS

1- Promotion and definition of vocational schools was reorganized and these schools of negative thought should be changed. Required importance should be given this school, technological support should be provided and this schools should be tried to be charming in the preferences of students and their families by bringing to the level of developed countries.

2- Newly opened vocational schools should be opened in accordance with regional and national needs and economic conditions. It is clear that there is a serious need for planning and government policies about this topic.

3- Vocational schools should be scheduled to allow qualified manpower training and providing to find jobs which has adequate economic level by rescuing of opening of vocational colleges from being the internal politics material.

4- The programs which will be applied in vocational schools should be planned long-term according to the needs of the region and the country. There should be continuous movement in accordance with this plan

5- Vocational schools which has parallel investments in manufacturing and service sectors should be opened and existing institutions should be modernized in accordance with the new technology to meet the needs of developing technology.

6- That the vocational schools give education bound to universities and getting an enough share from scientific incentives will have a big contribution to realize aims of individuals getting education.

7- The modernization of vocational and technical education to keep pace with the rapidly developing technology should be considered, projects should be increased, share allocated to vocational and technical education from the general budget should be remarkably increased.

8- Teaching staff who has sufficient number and knowledge should be taken to bring the number of students per instructor to level of developed countries.

9- Vocational schools open within private universities should have their ability to produce adequate machinery, equipment and services controlled and it is vital to educate qualified labor that department which can not keep pace with technological developments should not be opened and the ones not modernized should be closed.

10- Vocational and technical education institutions buildings, facilities, implementation units, workshops and laboratories should run in cooperation with the private sector and students studying in the private or public sector should take practical training outside of practice.

11- Vocational schools have an aim to get a job and bring changes about individual's professional ethics and their social life. Vocational schools far away from residential areas isolated location decrease the efficiency.

12- There should be enough equipment and staff within the organization to eliminate the problems which is emerged by the obligation of provided practical courses in the curriculum.

13- Students' practical training should be in enterprises having appropriate technological and physical conditions at least 2 terms with the subject of students being in education period.

14- The department wanted to be opened with in vocational schools should be opened in cooperation with Ministry of National Education (MONE), Turkey Business Association (TEO) and the Turkey Statistical Institute (TSI) to do workforce analysis needed as Vocational and technical education across the country and regional.

15- Vocational Qualifications Authority (VQA) should develop occupational standards in prior sectors, standard of Vocational Qualifications System in active practice and training should be shaped in accordance with needs of the labor market.

16- Ministry of National Education tries to eliminate the complication by gathering the many units under one roof which completed the work of reducing the type of school and restructuring of ministerial departments through both projects and changes in legislation recently. However, the denominator allocated for vocational and technical education declined seriously and addressing the issues within the scope of these changes has a big contribution in education qualified labor.

17- Teaching staff who will give education and practice in vocational schools should have sufficient history and should be recruited by doing practice interview.

18- Vocational Schools should have sufficient number of technical staff and preparation of environment should be provided in terms of cost and functionality.

19- The right of absenteeism of students in the period of education should be decreased, especially participation to practice classes should be provided.

20- Fields entered by the direct passing exam should be expanded and the coefficient related to graduation grade in the exams made central system should be increased.

21- There should be a priority to Vocational School graduates among the employees in public sector.

22- Due to the expiration of the transition system without examination both the quality of the student will increase and students who has better ability to get information and skill will enter the vocational schools.

23- Graduates monitoring unit should be created by the universities to held in the employment of the students graduated from vocational schools and this unit should show way by referencing the businesses.

24- Government funding for the students who choose vocational schools should be increased and these schools should be turned into preferable schools.

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Abbreviations:

ERI: Education reform initiative.

CEUT: Confederation of Employers' Unions of Turkey

TSR: Turkey Social Research.

Quality Enhancement Of Palestinian Higher Education Institutions: The Case Of Islamic University Of Gaza (IUG)

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ABSTRACT

The Palestinian tertiary education system considered to be young according to international standards, as the establishment of the oldest university was only forty years ago. The Palestinian universities were created during Israeli occupation, as part of a Palestinian collective effort to preserve the Palestinian identity as well as to provide young Palestinians with the opportunity to pursue higher education. Quality assurance efforts in Palestine had begun in 2002 with the establishment of the Palestinian Accreditation & Quality Assurance Commission (AQAC). IUG, being one of the biggest higher education institutions in Palestine, established its quality unit immediately and worked in linking its internal quality procedures with external national ones managed by AQAC.   The purpose of this paper was to describe IUG quality procedures; with regard to: students, academic programs, teaching and learning, university staff, university environment, administration, and the collection of external feedback.   Several challenges were presented along with lessons learned.

Keywords: *Quality, Quality Assurance, Higher Education, Palestine, Quality Enhancement.*

INTRODUCTION

The Palestinian tertiary education system is considered to be young according to international standards, as the establishment of the oldest university was only in the 1970's. Palestinian Universities were created during Israeli occupation, as part of a Palestinian collective effort to preserve the Palestinian identity as well as to provide young Palestinians with the opportunity to pursue higher education. The Palestinian higher education system as a whole have witnessed large shifts after the war in June 1967, as there has been wide spread in establishing community colleges and then the establishment of the major Palestinian universities began in 1971. Years between "1971 – 1979" have witnessed the establishment of six universities, which came as result of national aspirations and as response to challenges imposed by the conditions of occupation on the one hand, and the Palestinian national struggle (MOEHE, 2003).   Palestinian higher education is unique in its structure as most universities are non-profit and non-governmental (public). See the following table for more details regarding types of TEIs in Palestine by periods of their creation and type of institutions.

Table 1: Types of TEIs in Palestine by periods of their creation Type of institutions

	Before the 1970s	During the 1970s	During the 1980s	During the 1990s	From 2000 till now	Total
Traditional universities		6	1	3	5	15
Open University*				1	1	
University colleges	1	1	1	8	5	18
Community colleges	2	4	3	5	6	20
Total	3	11	5	17	7	53

According to MOHE recent statistics (2013), the number of Palestinian higher education institutions is (53). They are distributed as follows: (15) Universities: (14 traditional universities, 1 open university), (18) University colleges, (20) Community colleges, all are private. There are (213,581) students registered in the Palestinian higher education institutions; (126,138) females , (87,443) males.   Because of the difficulties it faces due to the Israeli occupation, the Palestinian tertiary education is struggling to exist. However, its newness has made it relatively open and, therefore, ready to embrace change. This explains its relative dynamism even in the face of adversity (Diambomba, 2009).

The concept of quality assurance in Palestinian higher education system has emerged as a result of its rapid development, the challenges it faces and criticism of its educational outcomes. The emergence of this concept was associated with the establishment Accreditation and Quality Assurance Commission (AQAC   ) in 2002 as a governmental semi-autonomous body under the umbrella of the Ministry of Education and Higher Education (MOEHE) and directly responsible to the Minister. The general objective of the Commission is the improvement of the quality of Palestinian higher educational programs and institutions. It has the responsibility of accreditation of new academic programs, and licensing and accrediting of any new educational institution, regardless of specialization and level of degree. Towards this end, it reviews existing criteria; develops new criteria for accreditation and licensing; and develops procedures for the ongoing comprehensive assessment of all programs of study that grant academic degrees." (AQAC, 2013).   AQAC worked for more than a decade in very complicated political, economic and social conditions. However, it was able to assist higher education institutions to improve their performance gradually using limited resources (Abou-dagga, 2013).

One of the biggest recognized higher education institutions in Palestine is the Islamic University of Gaza (IUG) . It is an independent academic institution supervised by the Ministry of Higher Education. It is a member of four associations: Association of Arab Universities, Federation of the Universities of the Islamic World, Community of Mediterranean Universities, and International Association of Universities. In addition, IUG works closely with numerous universities around the world.   IUG provides for its students an academic environment that adheres to Islamic principles as well as Palestinian traditions and customs. It also provides all available resources, including the most up-to-date technology in service of the education process. IUG offers more 114 programs at the different levels (B. A, higher diploma, Masters, Ph. D. and professional diploma) for almost 20,000 students.   IUG has developed in 2004 the 1st strategic plan (2005 to 2010) in 2010, IUG developed the 2nd strategic plan (2011-2013). IUG strategic goals are to:

- raise the levels of educational programs based on quality standards

- develop, support and invest in scientific research tin order to achieve continual development

- Strengthen the university's role in serving and developing the society.

- Regulate and raise the efficiency of technical and administrative institutional performance.

- Improve the university environment and the level of services presented to students and staff.

- Reinforce partnership and cooperative relationships with local, regional and international organizations.

The enhancement of the quality of higher education has been among the key issues and concerns facing higher education in all countries. Within institutions of higher education, use of external examiners, self-evaluation and academic audits are the most common forms of quality assurance processes. The question of how effective quality assurance systems should be designed and implemented is subject to wide debate (Kis, 2005).   Harvey & Williams (2010) stated that the "external quality evaluations are not particularly good at encouraging improvement, especially when they had a strong accountability brief. An essential element in this failure is the apparent dissolution of trust. Another issue is the use of industrial models and TQM in particular, which contributors, on the whole, regarded as of little use in the higher education setting".   Lim (1999) argues that the 'best practice in quality assurance in higher education' includes: 1) establishing a mission for the institution followed by the functions that have to be carried out to achieve this mission and setting the objectives for each function; 2) quality management system introduced to ensure the quality of the programs; 3) an external audit system to assess the effectiveness of the management system; 4) strong commitment on the part of university leaders and managers to Quality advancement. Williams (1997) states that over elaborate bureaucratic systems of external monitoring may lead to internal processes becoming determined by external requirements, but at the expense of what is good for the Higher Education Institutions. Thus innovation may suffer for fear that it will not be understood.

- A study by Shah (2013) on 30 Australian universities to assess the extent to which audits by the Australian Universities Quality Agency (AUQA) have improved quality assurance in the core and support areas of the universities, showed that   external quality audits alone cannot be credited for improving quality

assurance in universities. A combination of external quality audits together with the internal and external operating environment has significantly contributed to improving quality assurance in universities. While external audits have led to an improvement in systems and processes in Australian universities, this study finds that they have not improved education outcomes and the student experience. Another study by Darandari, & Hoke (2013) about the Saudi Arabian experience where the national quality assurance system used in Higher Education Institutions (HEIs) showed that the external quality assurance system had to lead change and organizational learning. Study emphasized the role of assessment and reflection methods used within the system to encourage continuous improvements and institutional learning and how they interacted with the organizational cultures. One can notice that the use of internal processes does not exclude the use of external processes. Harvey (2002) argues that the interaction between both processes is essential to ensure that the results of external monitoring are not just temporary adjustments but lead to lasting improvement.

Since the establishment of AQAC, there was considerable amount of structural and organizational changes has taken place recently in many higher institutions in Palestine. Many of the changes could be attributed to quality efforts launched by AQAC; others could be attributed to internal quality procedures in the different higher education institutions.   Recognizing IUG efforts to meet the requirements and standards of the national accreditation commission, and gain the confidence of the stakeholders & society with regards to graduates in the light of specific clear standards, it is worthwhile to be familiar with IUG experience of quality. Therefore, the purpose of this study is to present the major IUG quality procedures and activities; and the challenges it faced with regard to quality in addition to lessons learned.

METHODOLOGY

The study was based on a desk study of published Palestinian quality information, and related documents and annual reports provided by IUG quality key personals. Focus group was conducted with selected key informants at IUG.   To be sure that they are key informants; they were selected based on the criterion that each one should have deep involvement in quality efforts at IUG.

RESULTS AND DISCUSSION

The results of documents' analysis provided a good description of the main quality processes that is implemented at IUG (Quality Unit, 2012, 2013). There are seven major areas of quality procedures as being of major importance to IUG faculty/departments in maintaining appropriate oversight of their existing arrangements. They are as follows:

Students	• IUG has clear published policies and procedures for the recruitment and admission of students including students with special needs to higher education that are fair, clear and explicit and are implemented consistently. The university admission committee review annually the colleges criteria for acceptance and makes sure that they are implemented as planned.
Program design, approval & monitoring and reviewing	• There are clear internal procedures and criteria for starting up new programs at IUG. A special form is used that assures the existence of society need for the specialization, the availability of human and logistic resources in addition to referencing subject benchmarks. Once the internal process is completed and approved, applications are prepared and sent to AQAC for external review and accreditation. Here we can see the link between the internal quality process with external one. AQAC criteria for opening new program are embedded in some way within IUG internal process. The criteria includes: 1) rational for opening the program, 2) the content for the academic program, 3) human & educational resources, 4) and quality procedures (for more details see the website of AQAC).

	• There are policies and procedures also to make sure that academic programs are effective and achieving their goals. The evaluation process focuses on having the departments to modify periodically (4-5) years their academic plans to meet the needs of the society taking into consideration subject benchmarks. IUG is working now in increasing the percentage of practical aspects in academic plans in addition to enhancing life needed skills in the curricula.
	
	• The quality unit had supervised internal evaluation activities for undergraduate programs that aspire to proceed with graduate programs. This internal assessment helped in self-reflection and brought about enhancement in the different programs.
	
	• IUG started procedures to encourage departments to review annually their programs using a special annual review form using AQAC criteria. Quality and Development Deanship follows up with the program review reports and gives departments feedback.
	
	• Several external evaluation activities for academic programs were conducted by AQAC at different times during the last ten years as follows:
	
	  • Health sciences programs in 2003.
	
	  • Social sciences and the humanities programs in 2005-2006.
	
	  • Science, engineering, and computer technology in 2006-2007.
	
	  • Education programs in 2009-2010.
	
	  • Science, economics, management, humanities, natural sciences, 2011.
	
	IUG quality unit supervised the implementation of the external evaluation feedback that enhances the quality of programs.

Teaching and learning	• There are procedures and mechanisms at the university level and faculty level to ensure that teaching and learning is achieving the programs goals. Examples: use of students evaluation forms, regular meetings with students and faculty, analysis of grades reports, annual reviews of program, external feedback … • There is formal and informal mechanisms available within the division /faculty /department to disseminate good practice in learning and teaching at both taught and research levels; • The examinations at division /faculty /department are well supervised and audited. • The University established its Centre for Excellence and E- learning to support faculty development. • There is an induction program for newly appointed faculty. • There were several developmental projects that supported teaching and learning in several departments. These projects were funded by Palestinian Quality Improvement Fund (QIF) that is financed by the World Bank and EU and supervised by the MOEHE. The projects are implemented in cooperation with local, Arabic and international partnerships.
University staff	• IUG makes sure that it recruits quality staff. The selection criteria and appointment procedures are clear, published and transparent. It worthwhile to note faculty at IUG graduated from almost 31 countries from all over the world. • There is a system that manages training courses for the academic and administrative staff based on needs assessment studies or performance

	assessment results. Courses include: Teaching skills, Computer skills, English Language skills (different levels). , Special training courses based on the needs of departments (e. g. psychological support after crisis, quality issues for labs, geographic systems, …), General skills (e.g. writing projects, SPSS, .. etc). Quality related topics courses: e.g. preparing self-assessment documents, preparing self-assessment institutional documents, how to prepare for a review mission.. etc . Annual training program for administrative staff in various administrative issues to improve capabilities of the university staff (2 training events are required for every staff at the university). • There is s system that evaluates the performance of all academic staff using: electronic student-faculty form, department chair- faculty evaluation form, dean- Faculty evaluation form, and annual report. There is an evaluation system that evaluates the performance of all administrative staff using electronic forms. • IUG conducts regular workshops for newly appointed staff and department chairs in the beginning of every year. This activity enhances the quality culture in the institution. • There is a reward system at IUG. It included awards such as: the employees' Annual Excellence Reward. More work is needed to enhance the existing system. The work is going on preparing the Teaching Excellence Award for faculty.
University environment	• There are procedures that follows-up continuously with improving the university environment (e.g. cafeteria library, medical services, the stadiums …) • The Quality and Development Deanship distribute periodically satisfaction surveys to measure the opinions for those involved (students - employees - visitors ...) regarding facilities and services. • Internal institutional assessment for the whole university had been conducted in 2010 that highlighted points of strength and weakness. Results of the self-evaluation report were used as a major document for preparing the second strategic plan for IUG.
Administrative structure for quality	• Establishment of Quality Unit structure in 2002. It includes both: the administrative unit and the academic unit. In 2103, the academic quality unit was merged with the administrative one in addition to the planning and development deanship in a new entity titled Quality and Development Deanship. • There are quality committees at the different colleges and unit. They are linked to the quality and development deanship. • There are efforts now to effectively link the performance management system with the quality system with the planning system. • There is a system for information management. More work is still needed .
Collection of external feedback and benefit from it	• Collecting external feedback is crucial to quality efforts at IUG. It is collected from different resources: external examiners, supervisors for graduation projects, and field training, … • Feedback is collected from graduates through the use of tracking graduate system • There is functional complain system that can be used by students, employees ….

Quality procedures at IUG were linked with its mission that states: "IUG is an academic institutions that strives to raise the educational, cultural and civilization levels in the Palestinian society, to keep up with current trends in higher education and technology advancements, to encourage scientific research, and to contribute in building future generations and developing the society in a framework of Islamic values." (IUG, 2013). This idea of linking planning system with quality system had been addressed strongly in literature (Lim, 1999; Shah, 2013). Linking internal quality system with the external one had assisted IUG to proceed confidently with quality activities. Several factors assisted in this regard:

- Quality was introduced at IUG as an authentic Islamic concept for the following terms: "Ihsan, Itqan, Tasdeed".

- Concept of quality at IUG was integrated gradually in the system. It was not introduced by force.

- The adoption of top management of quality concepts was supported with suitable strategies and policies at different levels. This has established a culture that supports quality.

- The formation of appropriate quality structure that meets the needs of the institution. Quality Unit was formed in 2002, then Quality and Development Deanship in 2013, besides to quality committees in colleges, departments and units.

- Holding regular training courses for staff and those in managerial positions in the field of quality in higher education, self-evaluation of the programs and external evaluation…

- Openness to international experiences and best practices in quality assurance and enhancement. This was manifested in use of external benchmarks in curricula development and modification, participating in regional and international conferences, workshops and training.

Several challenges were encountered. They include: 1) Gaza's being under siege besides the unstable Arab political environment which affected negatively the implementation of institutional plans and making it difficult to invite and consult with experts. 2) There are no standards & models for QA that fits with our culture. 3) Quality as a concept needed time to be fully integrated in the culture of the institution. 4) Administrative processes at IUG are not all automated. 5) Limited financial resources for quality and development activities.

CONCLUSION

Quality is a long journey. It needs patience, commitment and clear vision about what is needed to be done to enhance educational outcomes. A number of lessons were learned as result of the different quality efforts at IUG. They involve: 1) the combination of external quality audits together with the internal and external had significantly contributed enhancing quality at IUG. 2) Quality is linked to our culture and is not difficult to be achieved depending on local expertise. 3) The existence of well-designed and linked strategic system, performance measurement system and quality system accelerates quality processes (holistic approach to quality). 4) Quality assurance worldwide experiences & models are good to be fully studied in order to build our own model that fits with our culture and meet our needs. Collaborative work between Arab and Islamic countries is needed in this regard. 5) Quality needs to be a priority to prevail in the institution. Moreover, it needed to be supported financially, technically and administratively from top management. 6) Continuous professional development for staff affected positively on the implementation of quality activities and enhanced the quality of outcomes.

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Quality In Higher Education In Greece: Deming's Theory Vs Ministerial Laws In Hellenic Universities

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ABSTRACT

In this presentation, an analysis of Greek laws that came into force in the last 30 years in order to improve higher education in Greece is initially attempted. These laws were introduced so as to improve higher education in Greece, but also to harmonize, quantitatively as well as qualitatively, with the wishes and needs of the employees involved, i.e. professors, students and administrative staff. In parallel, Deming's theory is presented and examined as a one which focuses on improving business structures in companies and organizations.

This paper attempts a comparative approach between the laws of the Greek state concerning higher education and the principles of Deming, trying to examine whether they can be applied, but also contribute to the improvement of the existing structure in Greek Universities.

Keywords:

INTRODUCTION

It is a fact that every organization, institution or enterprise must be adjusted to any new data of the era in which it operates, in order to improve and provide significantly improved services to citizens served by them.

Greek Universities have become the field during the past decades, of a constant implementation of new laws which were adopted through these years by Ministers and their staffs in order to change, partially or generally, many of the existing data and lead to minor or major changes in the way they operate.

The big question is whether these higher staffs know from the inside what is going on in Greek Universities and if they can establish laws that really improve the functioning of these institutions. Often, higher stuff who implicates new laws does not know the Greek educational reality and simply implement what their asked to do, by some leaders of some institutions or regions to which they belong (Nova-Kaltsouni, 2010: 153).

The question is whether known management theories worldwide, those that have proved that they can actually help the improvement of many organizations -not only educational- are consciously adopted and ultimately help to improve the functioning of the institutions concerned. In the following lines are examined the correlations between individual laws and the Deming's principles.

METHODOLOGY

Our analysis was based on two parameters. On the one hand, and at first, we studied all laws adopted by the greek governments over the last 30 years, related to educational issues. We analyzed them in depth, in order to realize their objectives in relation to the desired result, but also to the existing social conditions.

Along with research in law articles and sources, we studied articles of university professors in prestigious media, which offer a direct and timely analysis of the phenomena of Greek education, focusing on issues of quality of Higher Education. Some of them are former ministers, so their opinion is weighty (Kremastinos, 2013: A 49).

Our second step was to read many scientific texts on the Management and more specifically related to Organization. We focused on the theory of Deming, because the principles contained therein have helped many countries and organizations to improve, up to a maximum level, their overall production process (Montana, Charnov, 2009: 347). We compared the content of the laws related to the changes of structures and services in Greek Universities, with the aforementioned theory.

Our third step was to attempt comparisons so that to see whether new laws are related directly or indirectly with it and the principles it contains. We wanted to see if the proposed laws include simply some nuggets from Deming's Theory and if scientific theories about organization may ultimately help Greek Education.

The last step in our methodological approach was to find and analyze whether these laws are related directly or indirectly to Deming's Theory and the principles it contains. Since we broke the Deming's Principles in four categories, we attempted to build four corresponding tables which facilitate and demonstrate those correlations. They were then analyzed and explaned so as to draw a comprehensive and centralized result of our research.

THE CONCEPT OF QUALITY IN HIGHER EDUCATION

Education at all levels should be characterized by a high degree of quality. The last word has several interpretations and any involved party of Education, from the smallest student to the relevant Minister, interprets it as she wants. By the term "quality" in education and by a common opinion, we mean optimal working conditions for teachers and administrators as well as the high degree of knowledge transfer to pupils and students.

These two cases (working conditions - high degree of knowledge transmission) are interlinked, because if the first is not at a high level, may adversely affect the latter, as well as vice-versa. Saying "working conditions" we mean buildings and educational equipment, as well as the relationship between wages and hours of working.

In Higher Education quality has always been -by the viewing of all Ministers who have served it- an attempt to modify it, in order to improve it, according to what they thought about the concept of improvement. But often their ideas run completely contrary to the beliefs of all kinds of employees or professors in higher Institutions (Kremastinos, op.cit.: A49).

This controversity led to many dangerous rifts between the two sides, to the point of risking sometimes even the function of the Institutions. The disagreements ranged from the fact that the top executives of the Ministry always have a technocratic opinion, while teachers, administrators and students a human-centered and more close to the situation within the Institutions.

The laws enacted during all these years from behalf of these executives, had to do with three main issues: a. the implement of rules related to the way of the central organization of Universities, b. the way and amounts of annual funding, c. about engagement and staff development (Kladis, Panousis, 2004: 113, 161, 179). In that way more practical and serious problems were not examined such as the mode of instruction, examination methods, the degree of satisfaction of students by professors, especially the relationship between final knowledge and requirements of society. We must mention that the first two do not ever interest senior executives who enact laws.

These problems led us to a big question about what constitutes quality in higher education and if it can be calculated. Can we measure it based on some variables? For instance, can we delineate it based on degrees and publications of all levels of the professors themselfs? Can we measure it by the number of graduate students, in which are also included doctoral students? Or maybe we should put as first criterion the quality of teaching within the university halls? (Kladis, Panousis, op.cit.: 161-163). Is it quantitative or rather qualitative the criteria of creativity and inspiration within universities? And how much these criteria are affected by technocratic economical theories about Organisation?

DEMING' S PRINCIPLES

Much of the action for quality, including specialized techniques to improve quality has been affected by W. Edwards Deming (Montana, Charnov, op.cit: 395). He was an American economist who worked in several countries and offered a great contribution in improving production of goods and services in many public and private enterprises. He established a number of principles, which were adopted by many organizations, leading to a vast improvement of their productivity (Kotler, 2000).

He formulated certain principles which should be followed by managers to lead their organizations to a quality target. We found that no other economic theory is so close to the education and the specific conditions prevailing in this as the Deming' s principles (Sarmaniotis, 2005: 329).

Deming felt that the «persistence in a purpose», combined with statistical quality control, will lead to a continuous quality improvement. Additionally he believed that the job board of high level administrative stuff is to find and correct the causes of failure, more than to identify the mistakes and failures as they occur. Deming summarizes the philosophy on three basic principles:

- Insistence on quality.

- All in a group.

- Use of the scientific method.

The most important of these principles are:

- Get rid of the barriers that deprive employees the pride in their work.

- Open communications and break down barriers between different departments.

- Do not rely on mass inspection to detect defects. Instead, use the statistical checking to be sure that the quality is created through the services offered.

- Eliminate labor levels defining live numerical proportions.

- Adopt a new philosophy of quality without delay.

- Identify problems whether they consist of faulty systems or employees and correct them.

- Improve continually your services so that to improve the competitive position of your Institution.

- Enhance and streamline the monitoring methods.

- Get rid of fear from the workplace so that everyone can work productively.

- Use modern methods of education and training over labor

- Establish a dynamic training programme.

- Eliminate numerical goals, as a way of mobilizing the employees. Instead give them methods to achieve these goals.

THE LAWS OF HIGHER EDUCATION IN GREECE

The laws introduced in Greece after the fall of the dictatorship in 1973 (milestone year for the Greek society because she went from authoritarianism to democracy) and relating to the operation and improvement of the structures of higher education are the 1268/1982 (Kladis, Panousis, 2009), 2083/1992, 3549/2007 (Nova-Kaltsouni, op.cit., Lakasas, 2012: 8) and 4009/2011 (FEK A΄ 195/6-9-11).

The fourth one has sparked great debates and conflicts among all actors of modern Greek education and is essentially the component and the effect of fermentation of all above mentioned laws.

All tried to change for the better the situation in Greek higher Institutions, but they did not achieve many goals, because practice has shown that in a society that is constantly changing and transforming, Education can't adapt quickly and easily, even based on successive laws, voted for its own interest (Lakasas, op.cit: 8). In just 30 years were established four (4) different laws and a large number of individual amendments to the three original, which complicated the data, rather than simplified. Some modifications are also contradictory to the previous laws, instead of improving or enhancing them (aefilios.wordpress.com/resources/legislation/).

Often the new Education Laws in Greece come not to improve standards in higher Education but to install new institutions or rules that simply facilitate their operation rather than improving it. Facilitating the function is an adaptive measure to the new state of affairs and not a one that improves quality.

The main achievement of recent laws (namely 4009/2011) is the foundation of ADIP (Archi DIasfalisis Piotitas - Quality Assurance Agency - Q.A.A), which is the instrument that controls the level of quality in higher education in Greece.

Specifically, all professors in higher Institutions in Greece are required to complete each year an identical form on the Internet, which contains the record of all their scientific works per year (G.O. A΄ 195/6-9-11). Their responses are transferred to a central network and are grouped in order to find, on one hand, the total number of all works classified by Department and by Institution, and also the average quantitative activity of professors.

Simultaneously, through the same system, it is required by all students to give their opinion about the quality of teaching, as well as about the services offered by the administrative staff. All these (student opinions - scientific studies of professors- administrative services) are couched in the form of Q.A.A. basically in a quantitative way, rather than qualitative. Results give an overview of each Department, spherical and technocratic, rather than specific and in a human scale.

GREEK LAWS VS DEMING' S PRINCIPLES

The first finding by the study and comparison attempted, is that none of the higher administrative stuff who elaborated respective laws, has ever mentioned publicly, even indirectly, any of the above names of international prestige economists associated to the improvement of management in various workplaces (according to the study and analysis of official notices in the Press by representatives of the Greek Ministry of Education, 1998-2012). This proves that these officers either do not want to admit their ignorance on the principles of modern management, or do not reveal the fact that they actually resorted to these principles, even by simply reading them.

The second finding is that although some of the relevant laws have a small even relation compared to the Deming' s principles, this is rather indirect or coincidental.

The following tables show the relationship between the Deming's principles to the above laws.

A. DEMING'S PRINCIPLES	B. CORRESPONDING LAWS	RELATION A - B
Adopt a new philosophy of quality without delay	4009/2011	great
Identify problems whether they consist of faulty systems or employees and correct them	4009/2011	average
Eliminate labor levels defining live numerical proportions	None	-
Open communications and break down barriers between different departments	1268/1982	small
Get rid of the barriers that deprive employees the pride in their work	None	-

Table 1. Internal issues of quality.

Two laws dealt with internal quality issues, the last 30 years, and by the five principles of Deming mentioned above, only three are associated to these laws. And although the 4009 law has large and middle relation with two corresponding Deming principles, the other, that of 1982, has very a very small one.

The fact that no law was interested in numerical ratios and harmful working levels (even as a simple reference) shows that in the Greek Universities prevails quantity at the expense of quality, and in parallel, the general interest is the mass production of graduates rather good knowledge provided to them. These references also concern the figures of professors and administrators.

A. DEMING'S PRINCIPLES	B. CORRESPONDING LAWS	RELATION A - B
Use modern methods of education and training over labor	2083/1992	small
Establish a dynamic training programme	1268/1982	average
Eliminate numerical goals, as a way of mobilizing the employees. Instead give them methods to achieve these goals	none	-

Table 2. Training Issues.

Only two laws are related to issues of quality in education, that of 1982 and the one of 1992, but the relationship to the principles of Deming are from small to medium in size. As mentioned above, the training of professors pass only through participation in conferences and writing articles, not at all by improving their capacities within university halls.

Improving quality of teaching can be realized thanks to attending seminars related to the transmission of knowledge and new pedagogical methods, particularly in regard to teacher-student relationships, both within auditoriums and academia in general, as well. But none of the above mentioned laws adopt something similar, so the quality of education remains low.

A. DEMING'S PRINCIPLES	B. CORRESPONDING LAWS	RELATION A - B
Enhance and streamline the monitoring methods	3549/2007	great
Do not rely on mass inspection to detect defects. Instead, use the statistical checking to be sure that the quality is created through the services offered	4009/2011	average
Get rid of fear from the workplace so that everyone can work productively	None	-

Table 3. Control Systems.

As regards control systems, the beginning was in 2007 with the 3549 act and having great relation to the

Deming's principles, but the effort was restricted in 2011 with a mid-sized relationship between law and Deming's principles. The statistical tests reported by him are not analyzed or supported by that law, who submits checks rather technocratic than in a human scale.

Fear, concerning the educational process, is not existing of course in the greek Universities, but we find this concept in other levels, such as securing the jobs of administratives and, in a second hand, of professors. Many were the references in Greek media about these problems the last two years and many members of the academic community are now out of work because of the absence of relevant laws, those who knock fear and provide a certain level of security that will lead to an increase of quality work.

A. DEMING' S PRINCIPLE	B. CORRESPONDING LAW	RELATION A – B
Improve continually your services so that to improve the competitive position of your institution	4009/2011	average

Table 4. Correlations with the external environment.

Only the latter act, the one of 2011 is attempting a correlation between the internal and external environment of Universities, trying to give impetus to the improvement of all academic institutions, regarding their competitiveness with other institutions. However, here also the law does not use largely the correlative principle of Deming, leaving Universities to compete themselves with others abroad, without clear results.

Competitiveness here does not mean that the Universities within and outside the country will try to outbid each other in numerical level, but that they will be able to reach each other for scientific purposes only, in order to achieve exchanges of knowledge and experiences, which will lead to a better position in the Greek and the world map ranking quality of these Institutions.

CONCLUSIONS

Greek state is trying at times to provide incentives for increased quality in the Greek educational Institutions at all levels and for all involved in this, employees or students.

The quality is measured initially with some quantitative criteria (number of degrees before the intake, number of publications, etc.) but mostly with some endogenous factors, such as the quality level of teachers in the classroom, satisfaction of students from these, the relationship between final knowledge and social reality.

Known worldwide management theories have proven that they can actually help the improvement of many organizations -not only educational- but they finally are applied only minimally in the case of Greek higher Education. The relationship between Deming's principles and laws of the Greek state is infinitesimal or non-existent.

The careful reader of laws relating to the improvement of the situation in Greek Universities can easily notice some small correlations with the principles of Deming, but also easily understand that this is rather random or relevant from a general academic knowledge of managers on the principles of management.

The fact that just in the year 2011 the Greek state reported quality issues and wanted to deal in depth with this, means that Greek Education goes very slowly. The main reason for that is that the way it works is mechanistic and based on a formal, we would say, bureaucratic process.

The fact is that a broader and deeper knowledge of the Deming's principles will allow a better implementation by the occasionally leaders of the Ministry of Education and would help in a more scientific approach to improve the quality of Higher Education in Greece, which will have a direct impact on the overall situation of society in this country.

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