A Model Investigating the Professional Profile of the HE Graduates: A Case Study of the Electrical Engineers of the TEI WM, Greece

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Abstract. In this study, the Careers Office of the Technological Educational Institute of West Macedonia surveyed the professional and academic situation of Electrical Engineer graduates during the period 1997-1999. The data were collected by qualitative methods using a structured questionnaire with a sample covering 41% of the target population. The main parameter investigated was the current professional situation of the graduates and data concerning their undergraduate and postgraduate studies. The survey concluded that unemployment among electrical engineering graduates is lower compared to other specialties of the TEI. Yet the picture changes, when the graduates’ hetero-employment is measured. The relatively good professional situation of the graduates can be partly attributed to the prestigious place in the labour market of older TEI specialties with consolidated professional rights and to the circumstantial development of the construction industry during the years preceding the Olympic Games. In: Sheibani K (ed). Proceedings of the 1st International Conference on Applied Operational Research – ICAOR (2008), pp 141–150. Lecture Notes in Management Science Vol. 1. ISSN 2008-0050.

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1 Introduction

The connection of Higher education (HE) to the labour market is a constant parameter, which should be taken into account by educational policy makers on both state and academic institution level. It is generally established that large divergences exist among various countries and fields of study concerning the absorption of higher education graduates by the labour market.
In the European Union the integration of new graduates in the labour market requires an average waiting time of 6 months. In only 5 out of 25 EU countries, (Denmark, Finland, Germany, Norway and Sweden) graduates are able to find a job immediately after graduation (Quintini, Martin, & Martin, 2007).

The structure of workforce in modern economies has changed considerably, as an increasing number of elementary and high school education employees are gradually being replaced by HE graduates. This shift in market demand of university graduates partly justifies the increase of highly qualified human resources, but cannot fully account for the excessive proportions it has reached in certain countries, including Greece, where tertiary educational institutions were set up on a massive scale (Seremetis, 2000).

The unemployment of new graduates is usually higher than the officially recorded one. In many countries a substantial percentage of graduates is hetero-employed, a fact that constitutes a type of "concealed" unemployment, since graduates are employed in a field irrelevant to their speciality. In Italy, for example, according to EUROSTAT about 47% of HE graduates are hetero-employed (Kaitanidi, 2004).

Focusing in the EU labour market we can underline two major problems concerning graduate employment: a) hetero-employment; although the EU average is not high, that is 6.2%, the problem is very serious in the southern part of Europe, where the percentage reaches 50% and b) the significant rate of graduate unemployment in certain countries, such as Spain (9.2%), Lithuania (8.5%) and Greece (7.1%) (Quintini, Martin, & Martin, 2007).

In Greece the professional situation of new graduates is worsening, because of the low wages and the reduction of spending power in 2006, compared to that of 2005, according to EUROSTAT (785 units of spending power against 855 in 2005) (Moshonas, 2006). Equally upsetting is the percentage of hetero-employment, which is the second highest in the EU, after Italy.

Almost 40% of the Greek university graduates are employed in sectors other than their educational backgrounds (TA NEA 2006). This is also confirmed by the graduates themselves; according to a relevant survey, 50.55% of them claim that there are no posts of work corresponding to their objects of study (KERDOS, 2006).

Nevertheless, the Greek labour market is capable of absorbing specialised human resources. According to the survey "Entering the labour market" (ibid), 82% of the graduates who participated, found their first job within the first 1-3 months from the moment they started job hunting, even if that job was not always relevant to their field of studies. This shows that the market has the potential to absorb people as long as they have some qualifications, even if these qualifications are irrelevant to their object of studies. In summary this indicates that there is no inadequate connection between education and labour market.

From the above it is evident that monitoring the graduates after their graduation and statistically recording and evaluating their professional situation is a necessary process. Firstly, because through this process primary data are collected and secondly, because useful conclusions are drawn based on quantitative indicators concerning the professional evolution of the graduates. Thirdly because the data can be utilized by government bodies, universities and professional unions.
This survey was carried out within the above mentioned framework. It examines the current professional situation of graduates, as well as various data concerning undergraduate and postgraduate studies. The survey was conducted in the period from September 2006 until December 2006, by the Careers Office of the TEI DM.

2 Methodology

2.1 Specifications of the survey – Collection of data

The specifications of the survey were common for all Technological Educational Institutes of the country and were compiled by the Co-ordination Committee of the Career Offices of the TEIs (Iliopoulou, 2004).

Telephone interviews were considered the most suitable method for the collection of data. For this purpose a structured questionnaire was used, which investigated main as well as partial qualitative elements. More specifically the questionnaire consists of three thematic topics concerning:

- the personal and marital status of the graduate
- his/her education/training and academic development,
- employment–unemployment and their basic features.

2.2 Target Population –and sampling


Stratified random sampling was chosen as a survey method in order to cover the population under review in the most representative way possible. The size of the sample was determined to be over 30% of the population (in fact it was 41%) to ensure a high level of representativeness and it was levelled per academic year and gender.

2.3 Statistical analysis

For the recording and processing of the sample, a special statistical package, SPSS (Statistical Package for the Social Sciences) (Makrakis, 2005) was selected. For the statistical analysis and presentation of data, methods of Descriptive as well as Deductive Statistics were used. For the investigation of cross-correlations between two variables X2 controls were held (Norusis, 2005).
It has to be noted that there are certain limitations, which can be attributed to the small size of the population in certain categories of graduates, such as the postgraduates, the unemployed as well as the idle graduates.

3 Results – Conclusions

The analysis of the 43 answers of the questionnaire was recorded in the form of the same number of tables, graphs and respective analytical conclusions. The most important of them are to be found in the following sections.

3.1 Educational data

Gender. The percentage of male graduates 87.32% is much higher in comparison to that of female graduates 12.68%. This proportion appears consistently in most traditional technical specialties in Greece. It has to be noted though that there is an increase in the number of female students recently (TC of Greece, 2003).

Performance during studies. The duration of studies appears to be long (average 6.8 years) and the GPA of the degree is below average standard - good for 86% of the graduates. The results show below standard performance and increasing difficulty on the part of the students to complete their studies.

Postgraduate studies. are pursued by a small number of graduates, amounting to 7%. The percentage is low compared to the increasing tendency for postgraduate degrees observed among current graduates according to MRB (ibid) and the National Institute of Labour (Economou & Plageras, 2002).

Knowledge of foreign languages. 6 out of 10 graduates claim to be good users of a foreign language, however only three out of ten have the relative certificate.

![Level of foreign language knowledge](image)

**Fig. 1.** Level of foreign language knowledge
Familiarity with the use of computers. According to their answers, 91.5% of the graduates have a good to excellent knowledge of computers. Again only few of them have got a certificate e.g. ECDL to certify their knowledge.

Training. A percentage of 39% has attended an extra program of training after graduating.

### 3.2 Factual information concerning employment

The status of the unemployed. The rate of unemployment among Electrical Engineering graduates is 5.63%. This percentage is considered to be quite good, compared to the average rate of unemployment of all TEI graduates, which amounted to 12.4% at the time of the survey (GS of NS, 2005).

![Employment Status](image)

**Fig. 2. Employment Status**

Predictions for the future are rather pessimistic. The construction industry which was booming in the period preceding the 2004 Olympic Games is currently declining.

As for the form of work relations, a marked tendency towards “full time employee” is observed, while the percentage of self-employed individuals is relatively small, which confirms the poor development of entrepreneurship in Greece.

### 3.3 The status of the employees

Full and Part time. The 2/3 of the graduates are wage earning employees and in their overwhelming majority full time. It is quite encouraging to note that part time employment is 9.3%, much lower than the European Union equivalent.
Hetero-employment. 6 out of 10 graduates are employed in their field of speciality, while 4 are either unemployed or employed in other fields. These numbers are rather satisfactory compared to the situation to be found in other sectors. Probable reasons: 1) the 2004 Olympics "golden era" of the construction industry 2) the limited competition of graduates for a place in the labour market, which is no longer applicable since the mass foundation of new TEI Departments, 3) the consolidation of professional rights of TEI Electrical Engineering graduates and the relatively good reputation the branch has managed to gain in the world of business.
**Frequent change of work.** For the 60.47% of employee graduates, their current work is not their first, while the average waiting period until they find a job, amounts to 14 months. This finding is consistent with the view that "the employee graduate is forced to change two to three jobs until s/he finds a permanent post of work. Additionally, the private sector seeks for the most part experienced employees, preferring not to entrust a place of work to an inexperienced graduate" (Escofet, 1999). Thus the rule of frequent change of employment is verified, while at the same time it is implied that the labour market prefers graduates with previous work experience. A similar survey conducted by MRB (TC of Greece, 2003) has also come to the same conclusion.

**Remuneration.** The take-home pay for the ~60% of wage earners ranges from 800 to 1500 €, while for the ~30% it is under 800 €, a sum relatively low considering the cost of living in Greece. Approximately 50% of the graduates are little to fairly satisfied with their wage. It is pointed out that in Greece the minimum wage is 668 € (KERDOS, 2006). The survey shows that electrical engineering graduates are in a relatively better position compared to other workers whose initial wage ranges between 400 to 650 € gross (Moshonas, 2006).

![Fluctuation of wages](image)

**Fig. 5.** Fluctuation of Wages

### 3.4 The status of the self-employed

**Size and way of setting up business.** 32.8% of the graduates own small businesses, the majority of which has only one employee.
4 Concluding Remarks

The unemployment and hetero-employment of Electrical Engineering graduates is clearly lower than the average unemployment of TEI graduates. If hetero-employment
is taken into consideration, though, the picture changes, since only 61% of the graduates are employed in their field of speciality.

This percentage can be considered quite satisfactory compared to that of other sectors. It is very likely however, that it will decrease due to the excessive number of graduates of similar specialities and the prolonged recession in the sectors of construction and industrial production.

Conducting similar surveys all over the world, which will share common specifications, or even better establishing a global monitoring programme of the HE graduates, will allow a quantitative recording of the relation between HE and the labour market, the extraction of comparative conclusions and the re-designing of the educational policy of states and universities, taking into account the new conditions of globalization in the HE area.

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Acronyms

ESYE: General Secretariat of National Statistical Service of Greece
TEI: Technological Educational Institution of West Macedonia
HE: Higher Education
ECDL: European Computer Driving Licence

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