ANALYZING THE EMPLOYABILITY OF HIGHER EDUCATION GRADUATES AND DETECTING THE EFFECTING FACTORS

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ABSTRACT

The employability of higher education graduates is nowadays one of the first priorities in Europe. This paper's main objectives are to analyze the existing differentiations in graduates' attitudes towards employment and to detect the effects of graduates' personal and educational characteristics on their employability. The first-born data used are based on the conduct of a survey on a large sample of 1541 graduates of Alexander TEI of Thessaloniki, Greece. The results yielded through thorough statistical analysis focus on two directions: a) the analysis of the main variables portraying graduates' activation towards employment after the acquisition of their first degree and b) the detection of the statistically significant effects of graduates' main characteristics to the variables describing their employability. Conclusions are drawn and further future work is suggested.

Keywords: Employability, labour market, higher education, university graduates, hetero-employment

1. INTRODUCTION

The number of fresh university graduates has been increased substantially during the last decade due to the high competitiveness in the labour market and the consequent dire need for specialization. This increase led to the rapid expansion of higher education in all European Union (EU) member countries. Thus, the employability of young graduates has become one of the first priorities in European, national and personal level, and constitutes today one of the main indicators of educational system's efficiency (Kostoglou and Paloukis, 2007a).

The employment status of higher education graduates, a certain number of years after obtaining their first degree, has been the main subject of several studies and surveys. The overall average EU-15 graduates' employment rate four years after graduation was 84% and the lowest rates were observed in France, Spain and Italy; 69%, 73% and 79% respectively (Mora et al., 2003; Schomburg and Teichler, 2006). According to these surveys, five out of six graduates in the examined EU countries are part of the labour force. Among the remaining ones some were in advanced academic study, some were still in professional training, some spent most of their time on child rearing and family care, and some opted for a broad range of other activities. Amongst those belonging to the labour force, the average unemployment rate was approximately 4% (Teichler, 2007).

Regarding the unemployment rates of university graduates of EU countries, Latvia (1,2%), Ireland (1.6%), Netherlands (1.7%) and Luxemburg (1.9%) enjoy the lowest rates of less than 2%. On the contrary, Spain (9.2%), Lithuania (8.5%), Hungary (7.5%) and Greece (7.1%) present graduates' unemployment rates exceeding 7%. As far as the overall unemployment rate is concerned, Poland seems to be in the worst EU position (18.6%). By comparing the results, it becomes clear that countries with high overall unemployment rate have also high graduates' unemployment (France, Greece, Poland and Spain). (Eurostat, 2004). Furthermore, the current trend in the labour market forces sometimes the fresh European graduates to search for a job that is not vocationally related to their subject of study (hetero-employment).

Despite the comparatively high graduates' unemployment rate in Greece, studies related to their employability were carried out mainly during the last decade; usually at institutional level. However, only a few of them were published. The first published study was carried out by the National Metsovio Technical University (NMTU), revealing that its young graduated engineers enjoy high employment rates, depending however significantly on the specialty. Also, some of university's specialties (civil engineers, topographers, architects and computer engineers) are among the ones with the lowest hetero-employment (NMTU, 2001). The second published institutional study was carried out by Alexander TEI of Thessaloniki (ATEI-Th) in 2007 and was addressed to the graduates of the years 1997-2001; this paper being based on the collected first-born data (Kostoglou and Paloukis, 2007b). The major relevant Greek study was addressed to the graduates of the years 1998 - 2000 of all 18 universities. The results yielded were based on a very large sample of 13580 graduates (22.3% of the total corresponding population). The principal findings can be summarized as follows: whilst 84% of university graduates are employed being 'labour incorporated' five to seven years after their graduation, 43% are not yet 'professionally incorporated'. This lack of professional incorporation is due to unemployment (6.4% of the total sample), to inactivity, i.e. non-active search for employment (9.3%) or principally due to lack of permanent employment (27%; about two thirds of these cases) (Karamesini, 2008). According to a recent survey conducted by the National Statistics Office concerning the employment of university graduates, only one out of two finds a job in short term (E-Paideia.net, 2006). The rest are unemployed or under-employed, resulting to the fact that 40% of Greek graduates are employed in sectors very different from their educational background, holding the second position after Italy among EU countries in hetero-employment (Newspaper "TA NEA", 2007).

The vast majority of the published studies give emphasis on the determination and subsequent analysis and/or comparison of the employment characteristics, lacking the detection of the factors effecting significantly graduates' employment. This research work attempts to cover exactly this gab focusing on the investigation of the significant factors and their effects on employment issues.

Regarding the structure of this paper, the research objectives as well as its contribution and advance of knowledge are argued in the next section. The fourth section is devoted to the description of conducted survey's design and adopted methodology. Work's main results are displayed and commented in paper's fifth section, being divided in two parts; the first one presents the results of descriptive analysis and the second focuses on the detection of significant effects on graduates' employability. Finally, the conclusions drawn are summarized opening the floor for suggested future work.

2. OBJECTIVES AND CONTRIBUTION

Graduates' employability includes numerous parameters, which define and characterize it. This paper focuses to the analysis of the main employment variables and to the thorough investigation of the factors affecting employability and graduates' attitudes towards the labour market.

This work's main objective is to detect the existing differentiations in graduates' attitudes towards employment, as well as in their employability prospects. Furthermore it aims to detect the effects of graduates' personal and educational characteristics on their employability.

This research work is the first one conducted in Greek higher technological education. Results and conclusions drawn are novel as they concentrate, for the first time, on the determination and statistical analysis of the existing statistically significant effects on graduates' employability. Regarding its contribution, the results and conclusions of this study can be useful for researchers in the fields of employment and labour market, decision makers in higher education establishments and in the ministries of education and employment, and, most importantly, fresh university graduates for a more efficient professional orientation. The advance of knowledge at international level, especially for countries with similar educational and employment characteristics with Greece, can also be substantial due to the lack of research in employment factor detection.

3. SURVEY'S DESIGN AND METHODOLOGY

The conduct of telephonic interviews with the use of a structured questionnaire was chosen as the most feasible and effective survey method. The main reasons for this decision were the geographical spreading of the graduates all over the country, their large number, and the consecutive prohibitive cost of interviewing or approaching them. The use of mail survey was also been rejected due to the expected low response rate according to relevant literature review. The methodology adopted was designed carefully in order to fit to the 'local' needs (Bishop et al., 1988).

A research team consisting of 14 persons (project leader, survey co-ordinator, analyst, evaluator, two computer technicians and eight interviewers) was formed for the implementation. The large database of graduates held in the Careers Office of ATEI-Th was used as the principal source for obtaining their necessary communication data. This information was initially extracted from an Oracle database in a file compatible to MS-Excel. Consecutively, data transition was carried out in a specially created file compatible to MS-Access where appropriate tests were applied regarding obvious faults and data consistency to several characteristics. The result of this procedure was a file consisting of all 5558 graduates of 20 departments having graduated in a period of five consecutive years. The data were stratified according to department, gender and year of graduation. Finally, the elements of every stratum were rearranged in a random manner.

A questionnaire formed by a previous pilot study has been used as the main survey tool after some essential adjustments to the 'local' needs. A new user-interactive computer programme was designed and applied for an efficient entry of the filled questionnaires. This application enabled the automatic filling and control of several fields from the graduates' database. This feature enabled the fast data entry avoiding errors. Additionally an intranet server was adjusted and three terminals were prepared for the use of the application. A strict security policy has been adopted with the creation of access codes and the receipt of automatic backup copies during the night hours. This procedure was a decisive factor for survey's safe and unbiased implementation. The eight interviewers were selected among 15 candidates

and subsequently trained extensively for the telephonic interviews and the use of the developed computer application giving special emphasis to the approach of the selected graduates.

Regarding the final sample size (number of filled and valid questionnaires) the target set was a fully stratified sample, sized 26-30% of total graduates' Additionally the sample size of every specialization (department of origin of graduates) should not be less then 50. The whole procedure lasted five months. Following the achievement of the sample sizes target the data were extracted to a file compatible to MS-Excel and given to the analyst for statistical elaboration.

4. ANALYSIS AND RESULTS

The final collected sample consisted of 1541 filled and valid questionnaires. The statistical analysis was carried out with the use of SPSS, v. 15.0, the statistical package for the social sciences. Graduates' responses were analyzed through descriptive and analytical statistical techniques with emphasis to the identification of the factors affecting significantly employability. This section is divided in two parts; in the first one, the main results of the responses' analysis are presented and discussed, whereas the second focuses on the detection of significantly affecting factors with the use of appropriate statistical analysis.

4.1 Main results

This subsection includes a selection of the most important results and findings directly related to graduates' employment. These findings focus on postgraduate studies' attendance and relevance, the detailed statuses and types of graduates' employment and its relation with the first degree, the way of finding the present position, the reasons for seeking another one, as well as the degree of satisfaction from employment and earnings.

The following two tables present the main information regarding the continuation of ATEI-Th graduates for postgraduate studies; attendance (table 1) and relevance with their first degree (table 2). Nearly one out of ten graduates has acquired or is currently (at the time of the survey) studying for a postgraduate degree. More than half of them have or will acquire this degree from a Greek university.

TABLE 1: POSTGRADUATE STUDIES ATTENDANCE

	Frequency	Percentage (%)
Yes (in Greece)	71	4.6
Yes (abroad)	65	4.2
No	1405	91.2
Total	1541	100.0

TABLE 2: RELEVANCE OF POSTGRADUATE STUDIES WITH FIRST DEGREE

	Frequency	Percentage (%)
Irrelevant	16	11.9
Small	6	4.4
Medium	13	9.6
High	43	31.9
Very high	57	42.2
Total	135	100.0

Table 2 shows that graduates' estimation about the relationship of their postgraduate studies with their basic degree covers the whole spectrum of the scale, from irrelevant to very high relevance. Nevertheless, the concentration of scale's positive values is significantly higher: about three quarters of the graduates who continued for postgraduate studies report that their relevance is high or very high.

Tables 3 and 4 present the most important findings regarding graduates' professional statuses. The first of them (table 3) includes the aggregate percentages of the four distinguished statuses.

TABLE 3: GRADUATES' PROFESSIONAL STATUSES

	Frequency	Percentage (%)
Employed	1108	71.9
Self-employed	197	12.8
Unemployed	129	8.4
Inactive	107	6.9
Total	1541	100.0

About 85% of the graduates are currently working (72% as employees and nearly 13% of them are self-employed). On the other hand, 8.4% are unemployed (in the process of looking for a job) and nearly 7% are inactive (not presently interested in seeking for employment). The analytical employment statuses of the graduates of all specialties are presented in table 4.

TABLE 4: EMPLOYMENT STATUSES FOR ALL SPECIALTIES

Department of graduation	Employed (%)	Self-employed (%)	Unemployed (%)	Inactive (%)	Sample size
Informatics	94.6	5.4	0.0	0.0	56
Vehicle engineering	83.1	11.9	0.0	5.1	59
Electronics	82.1	9.5	2.1	6.3	95
Automation	78.2	18.2	3.6	0.0	55
Accounting	72.9	13.8	3.6	9.8	225
Aesthetics and cosmetology	51.0	25.5	3.9	19.6	51
Civil infrastructure engineering	50.0	35.2	5.6	9.3	54
Nutrition and dietetics	47.3	41.8	7.3	3.6	55
Physiotherapy	57.4	26.2	8.2	8.2	61
Marketing	75.9	9.3	8.6	6.2	162
Midwefery	80.4	2.0	9.8	7.8	51
Library science	84.0	4.0	12.0	0.0	50
Food technology	68.0	12.0	12.0	8.0	50
Nursing	83.2	1.7	12.6	2.5	119
Animal production	69.8	5.7	13.2	11.3	53
Medical laboratories	71.7	5.0	13.3	10.0	60
Farm management	64.7	5.9	13.7	15.7	51
Plant production	61.7	21.0	14.8	2.5	81
Tourist industry	68.0	12.0	15.0	5.0	100
Childhood care and education	69.8	3.8	15.1	11.3	53
Total	**71.9**	**12.8**	**8.4**	**6.9**	**1541**

Having ranked the departments of origin (specialties) of graduates in ascending order of unemployment rate, the conclusions are evident. The graduates of the faculty of technological applications (informatics, vehicle engineering, electronics, automation and secondarily civil infrastructure engineering) present the lowest unemployment rates. Graduates of accounting and nutrition and dietetics have also low rates of unemployment. On the other hand, six (out of the 20 examined) specialties related to agriculture (food or animal production and farm management), health (medical laboratories, childhood care and education and nursing) and tourism suffer of unemployment rates over 12.5%.

The type of employment of working graduates is presented in table 5. Eight out of ten of them are full time employees, whereas only 5% are engaged on part-time basis. About one third of the self-

employed graduates have personnel in their enterprise (5.1% of the employed graduates); the others (nearly 10% of the working population) work alone.

TABLE 5: TYPE OF EMPLOYMENT

	Frequency	Percentage (%)
Full time employee	1036	80.2
Part time employee	65	5.0
Self-employed with employees	66	5.1
Self-employed without employees	124	9.6
Total	1291	100.0

Figure 1 portrays the relation between bachelor studies and present employment. This relationship is mainly either high or very high (60%) or minimal (25%), showing that one out of four graduates have switched to hetero-employment a recent phenomenon having been observed in Greece as well as in some other EU countries (Kostoglou et al., 2007c).
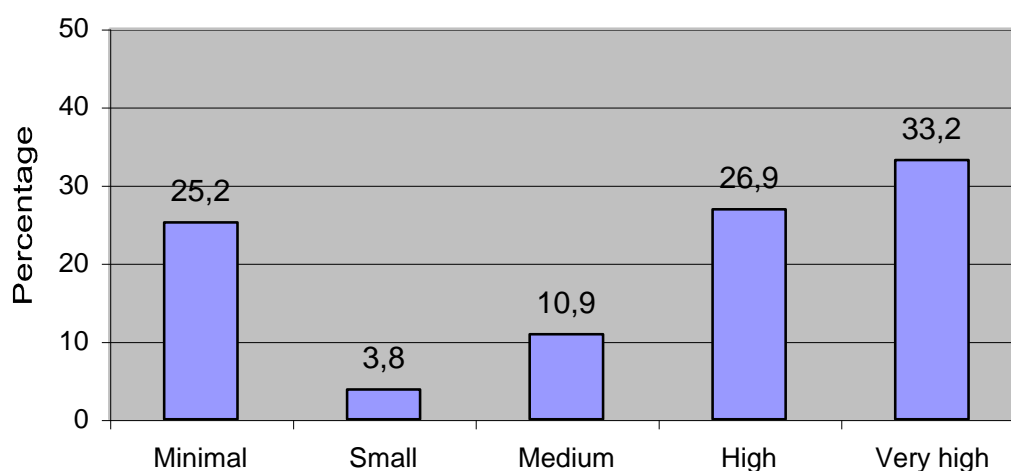
**FIGURE 1:** RELATION BETWEEN STUDIES AND EMPLOYMENT

Table 6 outlines another important characteristic of graduate's employment, the way they found their present position. The results show that graduates have used nearly all possible channels for finding a position in the labour market. Nevertheless, there is an obvious preference in the formal state examinations (often held at national level for various specializations) where at least 38% of university graduates have eventually succeeded, in family or personal connections (22.5%) and in announcements

published in newspapers, coming mainly from the private sector (18%). Some other not clearly defined procedures have been the successful means for quite a few graduates (11.7%). It is worth noting that some well known channels of the public sector (the nationwide Manpower Employment Organization, the compulsory six-month practical training and institution's Career Office) seem to be unpopular - and possibly ineffective - channels for helping graduates in getting a position in the labour market, as they have contributed cumulatively in less than 10% of the total number of engagements.

TABLE 6: WAY OF FINDING PRESENT POSITION

|	Frequency	Percentage (%)
Through state examinations	421	38.4
With the help of friends or family	247	22.5
From announcements in newspapers	197	18.0
Through other procedure(s)	128	11.7
Through the 6-month practical training	54	4.9
From Manpower Employment Organization	33	3.0
From the Career Office of TEI	16	1.5
Total	1096	100.0

The degree of graduates' satisfaction from their employment is portrayed in the next three figures. The first of them (fig. 2) presents the satisfaction of all employed graduates, the next one (fig. 3) the satisfaction of the self-employed ones and the last (fig. 4) the satisfaction from their earnings.
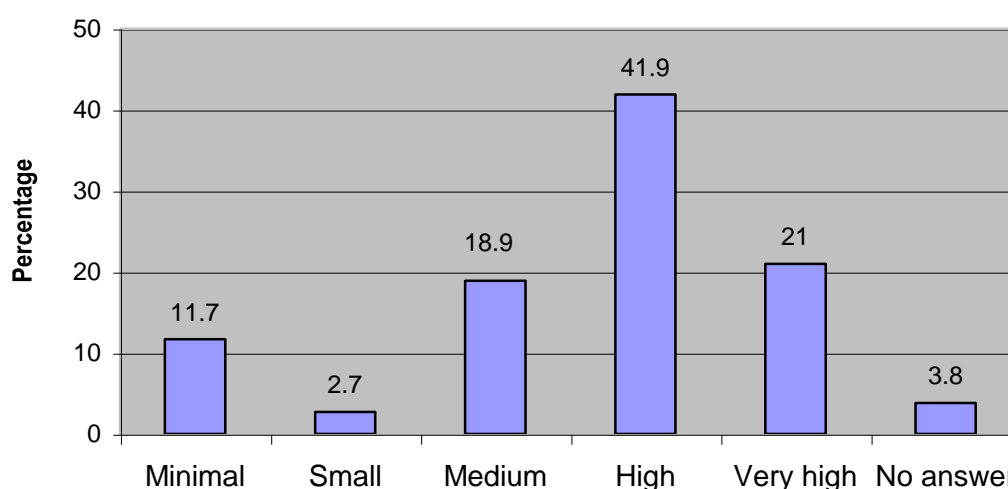
FIGURE 2: SATISFACTION FROM PRESENT EMPLOYMENT (ALL EMPLOYED GRADUATES)

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More than six out of ten employed graduates (63%) report that they are highly or very highly satisfied from their present position. Almost two out of ten stand for medium satisfaction and nearly 15% declare their dissatisfaction.

The results presented on figure 3 prove that the satisfaction of self-employed graduates is much higher. The vast majority (86.2%) are very or quite satisfied from their decision to have their own business, and only a few (13.4%) report dissatisfaction.
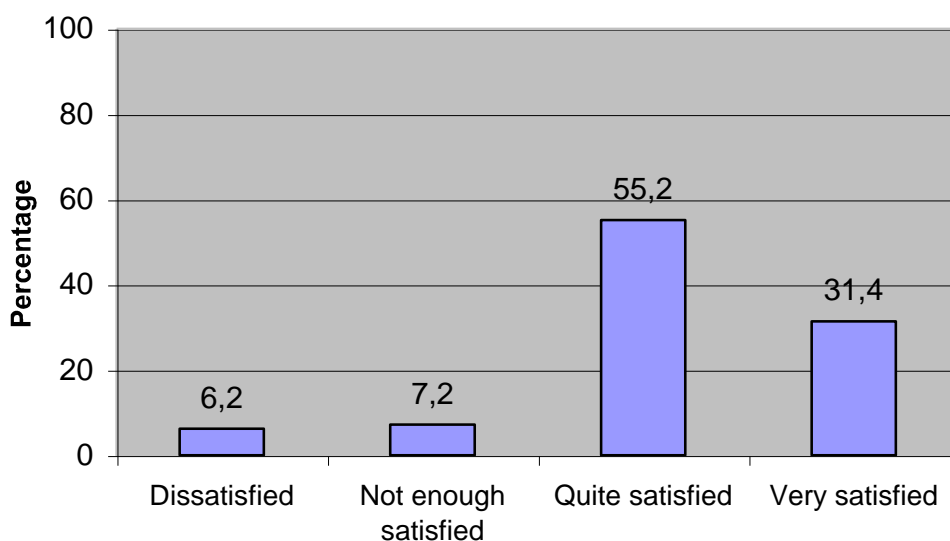
FIGURE 3: SATISFACTION FROM PRESENT EMPLOYMENT (SELF-EMPLOYED GRADUATES)

Regarding the satisfaction from their remuneration, the relevant distribution is quite symmetrical (figure 4). Nearly two thirds of them (63.6%) report medium or high satisfaction, whereas there is a significant percentage (17.1%) that reports dissatisfaction. Very few graduates (5.5%) seem to be very satisfied from their wage. It is worth noting that the overall satisfaction from salary is significantly lower than the one from the employment itself and even more from self-employment. These findings are further confirmed by graduates' answers regarding the reasons for seeking another position (table 7).
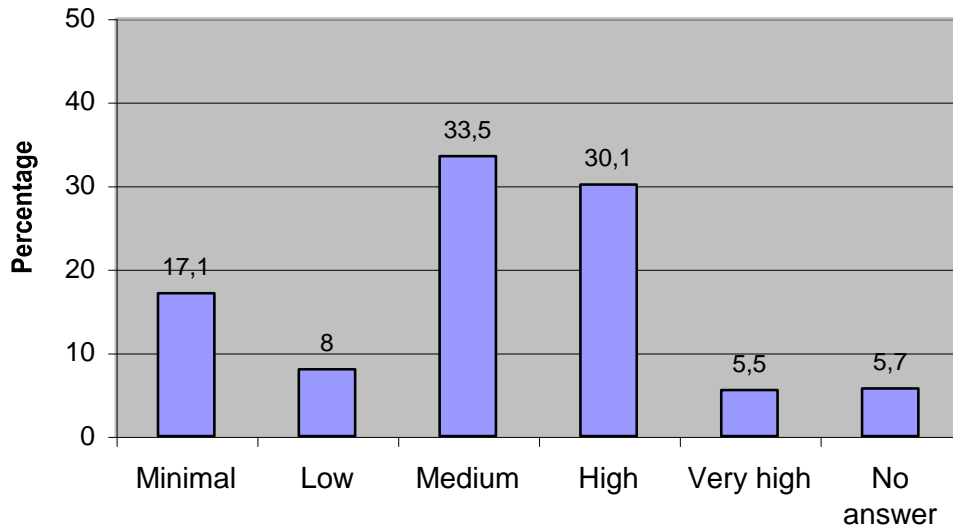
FIGURE 4: SATISFACTION FROM SALARY

TABLE 7: REASONS FOR SEEKING ANOTHER POSITION

	Frequency	Percentage (%)
The present position is not related to studies	150	13.5
The present position does not satisfy ambitions	168	15.2
The salary is not satisfactory	433	39.1
Other reason	234	21.1
No answer	123	11.1

The present salary is the principal reason for changing job for nearly 40% of working graduates. The lack of relevance with their bachelor degree and the position's prospects gathering 13.5% and 15.2% of the answers respectively are the other two main reasons for seeking for another position. Other not specified reasons concentrate the relevant selection of at least one-fifth (21.1%) of the respondents.

4.2 The affecting factors

The association among the main employment variables is investigated with the use of techniques of inductive statistical analysis. Depending on the type of relevant variables and available data, the techniques used are the following:

1. The X^2 test and the Cramer's V coefficient

The classical X^2 test is used for the detection of existing association between any two nominal variables; considering one as dependent and one as independent. Having set a significance level of 95%, a p-value less than 0.05 is considered as statistically significant.

The statistical Cramer's V is the most appropriate measure for cases with small number of registrations in the contigency tables. The Cramer's V is directly explanatory as its maximum value is the unity. V-values greater than 0.25 are considered as significant.

2. The analysis of variance (ANOVA)

The ANOVA was used for cases of connection between a quantitative and a qualitative variable. P-values of less than 0.05 denote the existence of statistical significance.

3. The Spearman's correlation coefficients

They are used as an auxiliary test for detecting any existing trends between ordinal variables. The coefficients, taking prices between -1 and 1, have been calculated for significance levels of 95% and 99%.

The analysis carried out focuses on the effects of the main graduates' characteristics (considered as independent variables) on the issues outlining employment (dependent variables). As problem's independent variables are selected the gender, the mark of degree, the place of residence, the department (specialty) and the faculty of origin as well as the degree of knowledge of foreign languages. The employment variables which's dependence is examined are the graduates' professional status, the kind of employment, the way of finding the present position, the salary, the time elapsed until first employment and the relationship between employment and bachelor degree.

Table 8 presents the revealed relationships between independent and dependent variables (the symbol ✓ signifies the existence of a statistically significant relationship at a significance level of 95%). The results show that graduates' gender and specialty (department) play the most important role on their employment characteristics, developing different attitudes towards employment. Regarding the existing trends of the statistically significant effects (examined additionally through the calculation of corresponding Spearman's correlation coefficients) it is worth noting the following findings.

TABLE 8: STATISTICALLY SIGNIFICANT RELATIONSHIPS BETWEEN INDEPENDENT AND DEPENDENT VARIABLES

Dependent variables → Independent variables	Professional status	Kind of employment	Self-employment	Way of finding present position	Salary	Time until first employment	Relation between employment and studies
Gender	✓	✓	✓	✓	✓	✓	
Mark of degree			✓	✓			
Place of residence				✓			
Department	✓	✓	✓	✓		✓	✓
Faculty						✓	✓
Knowledge of English				✓		✓	
Knowledge of French				✓		✓	

- Gender vs. professional status:

The percentage of self-employed men is at least double than that of women (18.8% vs. 9.1%). At the same time, men suffer of half unemployment or inactivity rates (4.4% vs. 10.9% and 4.1% vs. 8.7% respectively).

- Gender vs. kind of employment

Women turn to part-time employment much more than men (6% vs. 3.7%). This, along with their low self-employment rates, results to women's significantly higher full-time employment (83.6% vs. 75.6%).

- Gender vs. way of finding present position

Men address to newspapers' announcements significantly more than women (23.2% vs. 14.6%) for a position in the labour market. On the other hand, women prefer to seek for work through public channels (42.4% found their present position through examinations and 3.9% through the Manpower Employment Organization; the corresponding percentages of men being 32.2% and 1.6% only). It has also been noticed that the environment of family and friends has helped for this purpose more the men graduates (26.5%) than the women ones (20%).

- Gender vs. salary

Monthly salary of up to 800 euro declares 30.2% of women; the corresponding percentage of men is 19.3% proving that women occupy the first position in low salaries. On the contrary, men excel significantly in the high ranges of salaries. All relevant statistical tests show that women graduates earn significantly less than men do.

- Gender vs. time until finding first work

ANOVA tests prove significant difference of the mean waiting time for finding work between men and women (16.8 and 10.8 months respectively). However, this six-month delay is probably due to men's military obligations.

- Place of residence vs. way of finding work

The place of residence plays a significant role in the channel used for finding work. The Manpower

Employment Organization is used much more in large cities and environment's help is greater in Athens and in small towns. Graduates living in small or larger cities of the province turn to state examinations much more than those from Athens and Thessaloniki.

- Mark of degree vs. way of finding present position

Higher degree marks give to candidates more confidence and turn them to state examinations. These graduates use significantly less newspapers announcements and family environment.

- Effects of foreign languages knowledge

Knowledge of the English language, as well as the degree of this knowledge plays a significant role on employment characteristics. Graduates with excellent knowledge present higher rates of full-time employment (81.7%, ten units above the average of 71.9%). Consequently, these graduates turn less to self-employment. In addition, the waiting time until finding their first work is significantly reduced (becoming at least four months shorter) for graduates with very good knowledge of English, French or Italian. The excellent knowledge of English turns strongly the graduates to state examinations instead of seeking the help of friends and family.

- Department/faculty of studies vs. relation between employment and studies

The effect of graduates' specialty on hetero-employment is very significant. The graduates of nearly all the departments of health sciences professions' faculty, as well as of Informatics report a very high relation between their employment and studies. On the contrary, graduates of the faculty of agriculture (Plant or Food production, Farm management), Marketing and Tourist industry evaluate that the average relation of their work with studies is small to medium.

5. CONCLUSIONS

Without doubt, graduates' employability is a multidimensional issue with several parameters describing their professional status, attitudes and relevant existing effects. This work's findings are based on the conduct of a survey on a large sample of graduates of a five-year period. The results focus on two

directions: a) the analysis of the main variables portraying graduates' activation towards employment after the acquisition of their first degree and b) the investigation of the significant effects of graduates' main characteristics to the variables describing their employment.

Almost a tenth of Alexander TEI of Thessaloniki graduates turn for a postgraduate degree in Greece or abroad. Three quarters of these degrees are highly or very highly relevant to their first degree. Graduates' overall employment and unemployment rates are 85% (72% working for an employer and 13% self-employed) and 8.4% respectively. The professional status depends highly on the department and faculty of graduation. The relation between specialty and employment is not always strong, indicating a high percentage of hetero-employment for the graduates of some departments.

ATEI-Th graduates have used all usual channels for getting their present position; the first main three priorities being the state examinations, the help of family or friends and the work advertisements in the press. Despite the relatively low salaries, being the first reason for seeking for another position, the satisfaction from the present employment is on average quite high. However, this satisfaction is significantly higher for the self-employed graduates.

It has been proved that all graduates' main characteristics (place of residence, mark of degree, faculty, as well as knowledge of English or French language) affect significantly at least one of the employment variables. Nevertheless, graduate gender and specialty are the most important characteristics affecting nearly all these variables and thus determining very different employability prospects and attitudes towards the labour market.

On our opinion the methodology adopted in this paper (or a similar one) should be repeated frequently for a constant detection of any significant changes in the effects on employability and relevant attitudes. Our suggestion is that the time interval between two successive surveys should not exceed three years. Equally, if not more, important is the communication of the corresponding results to the decision makers and to the fresh higher education graduates.

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