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OF EDUCATION
IN THE 21st CENTURY
Volume 39, 2012

FEMALE FACULTY MEMBERS IN THE FIELD OF ELECTRICAL AND COMPUTER ENGINEERING: THE CASE OF GREEK UNIVERSITIES

Anny Assimaki, Gerasimos Koustourakis
University of Patras, Patra, Greece
E-mail: asimaki@upatras.gr, koustourakis@upatras.gr

Konstantina Papaspyropoulou
E-mail: konstanpapa@gmail.com

Abstract

Issues concerning the presence and professional development of women in the academic world have occupied the social sciences since the 1980s. The purpose of this study is to trace the presence and prospects for professional employment and development of women faculty members in the field of Electrical and Computer Engineering (E.C.E.) in the case of Greek universities, at the start of the 21st century. Sources for this research were women who teach in E.C.E. departments in Greek universities. The research data come from phone interviews with female professors who work in the E.C.E. departments, and from information drawn from the secretary's offices and the websites of the specific departments. The most significant research findings revealed that in the field of E.C.E. in Greece, the social structural difference between the sexes still survive. This fact creates difficulties for the career progression and professional development of women, who also face difficulties in their work due to the commitments which are involved in the fulfillment of the demands of the role of mother. In addition, many of the difficulties faced by these particular women in their career result from the activating of prejudices concerning the female gender, which seems to be invading the 'male dominated' field of E.C.E. in the case of Greek universities.

Key words: *Electrical and Computer Engineering, female faculty members, Greece, universities*.

Introduction

The issues surrounding the presence of women in the academic world, as well as their professional development within it, continue to occupy the social sciences and in particular the field of 'women's studies' (see: Acker, 1992; Anders, 2004; Bagilhole, 1993; Enders, 2000; Forster, 2001; Hemmings, Rushbrook & Smith, 2007; O'Conner, 2008). Indeed, women's increased access to higher education after the end of the Second World War, at least in the case of the economically developed western world, resulted in their infiltration of previously male-dominated professional fields, such as the Sciences and technologies (Arnot, 2004, p. 369). Nevertheless, the infiltration of women into the domain of university teaching, is much smaller.

In Greece in particular, while during the academic year 2008-2009 out of the whole student population of 171,882 individuals, 65,564 were men (38.14%) and 104,318 were women (61.86%) (Sianou-Kyrigou, 2010:127), female Faculty members (F.M.) made up just 28% of the total of teaching staff at Greek universities (Anastasaki, 2007; Maragkoudaki, 2008)

ISSN 1822-7864

and were to be found at lower levels of the academic hierarchy (Vosniadou & Vahiou, 2005). Very similar is the picture of female F.M. internationally, where it has been found that their numbers in the fields of the Sciences and of Engineering and of Information and Communication technology are small, while it is also true that many women who work in these particular fields often face discrimination based on their gender (Walsh & Osipow, 1994, p. 15-16). Besides, career progression in the university world always possessed an elitist character as far as its culture, structure and values were concerned and appeared to better suit the choices of men (Poole, Bornholt & Summers, 2006). More specifically, as far as the field of the technologies is concerned, the views and positions of the two sexes differ, due to prejudices about their differing roles, making women's access to that field more difficult (Berggren, 2008; Kusku, Ozbilgin & Ozkale, 2007). To explain this particular phenomenon Robinson & Mcllwee (1991) use the term '*culture of engineering*' which links masculinity with the machine as much in the various fields of work as in the case of university research and teaching. This fact, according to Seymour (1995), seems to have a negative effect on women's choices and distances them from the fields of the sciences and the new technologies.

A study of the scientific bibliography reveals a lack of recent studies which investigate in depth the participation of women as F.M. in 'male-dominated' academic fields in Greece, such as the field of the New Technologies, as well as the factors which influence the course of their academic career and the difficulties they face in their attempt to progress (see: Anastasaki, 2007; Eliou, 1994; Kontogiannopoulou-Polydoridi, 1995; Maragkoudaki, 2008; Vosniadou, 2005).

The purpose of this study is to trace the presence and prospects for professional employment and development of female faculty members in the field of Electrical and Computer Engineering (E.C.E.) in the case of Greek universities, at the end of the first decade of the 21st century. In addition, it is also important to investigate the extent to which their gender constitutes an obstacle to women's upward mobility in the university field of E.C.E., as well as in the assumption of administrative positions within the universities. This is because it is professional occupation and specialization which constitute the basic elements which determine gendered social relations (Maruani, 2006; Molinier, 2003; Siann & Callaghan, 2010).

The study begins with the theoretical framework, which makes use of Bourdieu's conceptual model. In particular, the concepts 'academic field', 'academic capital' and 'habitus' will be used. Next, the research questions and the methodology used are defined. The "Quantitative and Qualitative results" gives a full description of the upcoming results of the study. Then the "Discussion" section discrabes the findings within the theoretical framework. Overall conclusions of the study are summarized in the "Conclusion" section.

Theoretical Framework

Bourdieu (1980) sees the social world as made up of various microcosms which he calls 'fields'. The concept of the field allows us to conceive of social reality in terms of relations. From this point of view, a field is a 'trend' or 'network', objective relations between 'positions' (Bourdieu & Wacquant, 1992, p. 72). The positions held by the agents in the field depend on the distribution of the various forms of capital which they possess. A field could also be understood as a structured space for social powers and struggles which resembles a game in which players who believe in it and in its stakes, take part (Accardo & Corcuff, 1986, p. 86; Acker, 2010; Bourdieu, 1980, pp. 113-114; Grenfell, 2007, p. 60). The concept of the academic field is a derivative of the concept of the field and consequently is a matter of a system of objective relations among vested interests which have their origins in a struggle and whose sights are set on securing a monopoly of the academic prestige, which is comprised of a particular form of capital, which is the academic capital. It is a 'social microcosm', a 'game space' which is

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governed by interest groups, power relations, strategies and social relations of domination, while at the same time, as a social space it exerts forms of coercion (Bourdieu, 2005, p. 26-27).

The concept of academic capital is based on the accumulated knowledge which the social agent possesses within a particular academic field and in the recognition of the rules which are applied within the field on the part of the participants (players), who take part in the games within the field. According to Bourdieu (2005, p. 31), it is a matter of a 'particular kind of symbolic capital', which is composed of, and shaped by, 'the recognition of fellow players' who are at the same time opponents in the game, and is determined by the following two forms a) the 'pure' scientific capital, which corresponds to and is dependent on the recognized contributions to science (mainly papers) and b) the 'institutional' scientific capital, which is acquired and accumulated within a political and strategic whole and which concerns participation in conferences, committees, symposia, ceremonies and so on. The two particular forms of capital correspond to two kinds of power within the academic field; a power of 'personal prestige' and an 'institutional' power, which has to do with participation in the administrative mechanisms of power (Bourdieu, 2005, p. 42-43).

The result of the scientific struggle within the academic field and the position that the socially active agent will occupy therein, depends as much on the accumulated scientific capital that he possesses as it does on his 'dispositions', which Bourdieu (2005) calls habitus. It concerns, in other words, the 'permanent and continuous modes of existence' of the social agents who also produce their practice. More specifically, Bourdieu points out that if the agents' intentions do not correspond to the demands of the field, then there is a possibility that they will find themselves either in a 'bad position' within the field or 'out of play', in other words, outside the field (Bourdieu, 1980, p. 88-89; Bourdieu, 2005, p. 34; Maton, 2008, p. 51).

Bearing this in mind, the successful entrance into, and the academic development and career progression of female F.M. within the 'male-dominated' academic field of E.C.E. depend as much on their initial scientific capital as they do on the continuous amassing of scientific capital which ensures scientific recognition and scientific prestige (Bourdieu, n.d., p. 96). This in turn is entirely dependent on the amount of time a female F.M. who works in the academic field of E.C.E. has in contrast with her male colleagues. It also depends on the women's internalized disposition (habitus) and on the capacity of the particular dispositions to respond to the demands of the 'male-dominated' academic field. Women's dispositions, however, may well not facilitate the gathering and formation of scientific capital, which is explicitly demanded, in order for them to be able to attain a position within the particular field. In other words, what is not facilitated, is their entrance into and professional development within those social spaces (fields) which are defined by their masculinity, as is the academic field of Electrical and Computer Engineering (Bourdieu, 2007, p. 115).

In order for a woman to attain a position of prestige as a social agent, such as a university position in the field of E.C.E., she would need to have a series of skills which are normally possessed by the male holders of such positions and which are formed through a kind of silent preparation (the shaping of their own habitus) according to their gender (Bourdieu, 2007, p. 164-167). As far as the gender factor is concerned, Bourdieu claims that there is a symbolic opposition which is easily discernible in European societies, which are dominated by male values, and which destine men for politics, science and war. It is a matter, in other words, of an identification of masculinity with domination, prestige and high status, while on the other hand women are destined for the fields of the household, literature, psychology and the humanistic sciences (Arnot, 2004, p. 95).

Methodology of Research

The following research questions were explored in this paper:

(1) What is the gender based composition of the teaching and research staff in the academic field of Electrical and Computer Engineering in the case of Greek universities?
(2) What are the prerequisites for entry into and hierarchical development within the field of E.C.E. in Greek universities for female F.M.s?
(3) What difficulties do female F.M.s face in their academic career progression in E.C.E. in Greek universities?

In order to answer the first two questions, data were drawn from the websites and secretary's offices of the E.C.E. departments of Greek universities, concerning the presence, position, scientific constitution and academic progress of female F.M. In addition, in order to investigate aspects of the second question and to answer the third research question, telephone interviews were conducted with female F.M.s in E.C.E. Departments.

Participants

12 out of a total of 23 female F.M.s in E.C.E. Departments at Greek universities responded to telephone interviews. Of those, 8 women (67%) were married and 4 (33%) were unmarried. In addition, 2 women were professors (25% of the total number of female professors), 4 were Associate professors (100% of the total number of women at this level), 3 were assistant professors (50% of the total number of women at the level of associate professor) and 3 were lecturers (60% of the total number of women at the level of lecturer).

Methods

The method of telephone interviews was used for two main reasons: a) due to the great geographical distance between the universities which have departments of E.C.E., it was difficult both financially and in terms of time for researchers to have access to them, and b) since in a telephone interview there is no visual contact between interviewer and interviewee this makes it easier to broach issues which could be considered 'sensitive', and also permits the research subjects to speak more freely on these issues (Mertens, 2009, p. 243-244; Robson, 2007, p.221-335; Sturges & Hanrahan, 2002, p. 108).

Data Analysis

In the chapter of the research results the quantitative and qualitative analysis of gathered data are presented. More specifically, in the section of the quantitative results the elaboration of the collected data from the websites and secretary's offices of the E.C.E. departments of Greek universities are shown. Also, the qualitative results drawn from the phone interviews are presented in the second part of the results.

Results of Research

Quantitative Results

Table 1 presents the distribution according to gender and university institution of F.M.s working in Departments of E.C.E. in Greek universities during the academic year 2010-2011.

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Table 1. Faculty members in the Departments of Electrical and Computer Engineering in Greek Universities in the academic year 2010-2011 (N/%).

Universities	Men	Women	Total of F.M.
National Technical University of Athens	83/89.9	9/10.1	92/100
University of Thessalonica	41/93.2	3/6.8	44/100
University of Patras	44/91.7	4/8.3	48/100
University of Thrace	43/87.8	6/12.2	49/100
Technical University of Crete	24/96.0	1/4.0	25/100
Total	235/91.1	23/8.9	258/100

Table 2 shows Faculty Members working in E.C.E Departments of Greek universities during the academic year 2010-2011, according to gender and grade.

Table 2. Faculty Members by gender and grade, in the Departments of Electrical and Computer Engineering of Greek Universities for the academic year 2010-2011 (N/%).

Grade	Men F.M.	Women F.M.	Total F.M. in the grade
Professor	123/93.9	8/6.1	131/100
Associate Professor	45/91.8	4/8.2	49/100
Assistant Professor	48/88.9	6/11.1	54/100
Lecturer	19/79.2	5/20.8	24/100
Total number of F.M.	235/91.1	23/8.9	258/100

A study of the results in Table 2 reveals that the percentage proportion of women among F.M. of the same grade drops as we proceed from the lower towards the higher grades in the educational hierarchy. More specifically, on examining the proportion of F.M. at each grade, we observe that the women working in the E.C.E. Departments at Greek universities during the academic year 2010-2011 are to be found in the lower educational grades (Lecturers 20.8% and Assistant Professors 11.1%). Furthermore, the 8 women who were working at the level of professor were to be found only in the corresponding Departments of the two oldest Greek universities, the National Technical university of Athens (6 female professors) and the University of Thessalonica (2 female professors). In addition, all the Associate Professors were to be found at the University of Thrace.

Table 3 shows the distribution by grade of female F.M. according to the entry requirements of the academic field of E.C.E.

Table 3. Entry requirements for female Faculty members in the field of Electrical and Computing Engineering in the academic year 2010-2011 (N/%).

Grade	F.M. in the grade	Postgraduate Studies abroad	Doctoral Thesis in the same Department	Prior work relationship with the University
Professor	8/100	5/62.5	3/37.5	1/12.5
Associate Professor	4/100	2/50.0	1/25.0	1/25.0
Assistant Professor	6/100	3/50.0	3/50.0	3/50.0
Lecturer	5/100	2/40.0	3/60.0	2/40.0
Total number of female F.M.	23/100	12/52.2	10/43.5	7/30.4

ISSN 1822-7864

From a study of the results in Table 3 it emerges the following:

1) The majority of female F.M. in Departments of E.C.E. has completed postgraduate studies abroad (12 women, 52.2% of the total number of female F.M.). In fact, the majority of women who complete postgraduate – and in particular doctoral – studies abroad are to be found at the top of the education hierarchy, in other words, at the level of professor (5 individuals, 62.5% of the total number of female professors). In addition, half of the women to be found at the levels of Associate and Assistant professor studied abroad. From a study of their Curricula Vitae we can conclude that their studies abroad, as well as their research and teaching work in foreign universities contributed to the appointment of 4 out of the 12 female F.M. directly to the position of Assistant professor, bypassing entirely the grade of lecturer. This is because these particular women attained high level academic qualifications, in other words, 'pure' academic capital which opened the door for their entry into the male-dominated academic field of E.C.E.

2) A second significant factor which appears to have favoured the entry of the majority of the women who are today F.M. in the Departments of E.C.E. at Greek universities, is the preparation of a doctoral thesis within the department to which they were then appointed (10 teachers, 43.5% of the total number of female F.M.). The majority of female F.M. in this category are to be found in the two lowest grades of the educational hierarchy (6 individuals, 54.5% and more specifically: 3 lecturers, 60% of female lecturers and 3 assistant professors, 50% of the women at this grade). And,

3) The prior work relationship of the majority of the female F.M. as assistants or research partners in the Departments of E.C.E. helped their entry into the sector of teaching staff (7 teachers, 30.4% of the total number of female F.M.). This factor is closely connected to the preparation of a doctoral thesis within the department that they work in today. This is because according to the transitions in the Law 1268/1982[1] for Greek universities, all those who, at the start of the 1980s, had permanent positions on teaching staff in the categories of scientific partner or assistant were given the opportunity, assuming they so wished, to be appointed to the grade of lecturer after receiving their doctoral title, and to follow a university career. What's more, even those assistants who did not hold a doctoral degree were permitted to prepare their doctoral thesis in the Department of E.C.E. of the university where they were working.

Table 4 presents the distribution by grade of female F.M. working in E.C.E. Departments during the academic year 2010-2011 according to the factors of age and career progression.

Table 4. Career progression of female Faculty members in the field of Electrical and Computer Engineering in Greek Universities in the academic year 2010-2011.

Grade	Average age (years)	Average length of time spent working in the same grade (years)	Average length of time before promotion to next grade (years)
Associate Professor	53.5	8.0	7.0
Assistant Professor	50.2	9.5	6.8
Lecturer	45.6	6.6	6.9

From a study of the results in Table 4, we conclude the following:

1) The average ages of 45.6 and 50.2 years old which correspond to the women at the level of lecturer and assistant professor respectively, are high. In addition, the difference in the average ages of female F.M. between the introductory grade of lecturer and the grade of associate professor is 7.9 years, relatively small in other words, and approaching the minimum

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time limit for progression from one grade to the next. It should be pointed out that, based on the current legislative framework for tertiary education in Greece which applies to the academic year 2010-2011, the period of service for a lecturer was seven years and the minimum length of service necessary before one could request promotion to the next level was three years. Moreover, the period of service for an assistant professor is three years and a teacher, after attaining permanent tenure at this grade at the end of the three years, could request to be promoted to the grade of associate professor. Finally, a teacher could request that the promotion procedure for her appointment to the grade of professor be started only after the completion of three years of service at the level of associate professor. Our findings concerning the average age by grade, as well as the difference in average ages between grades in the educational hierarchy which concern female F.M. who work in Departments of E.C.E. in Greek universities can be interpreted as being influenced by two factors: a) the difficulty women face in entering the male dominated world of the academic field of E.C.E. This is because appointment to the grade of permanent lecturer for women who held the position of permanent assistant academic staff (5 out of the 11 female F.M. who are to be found at the two lower levels of the education hierarchy, 45.5%) and who could, thanks to the beneficial clauses of the Law 1268/1982, follow a university career, seem to have occurred only over the last decade, in other words hesitantly and with much delay. It is worth noting that for all this time – from the beginning of the 1980s until their appointment to the grade of permanent lecturer - these women were working as permanent assistant academic staff in their departments. The second factor b) is the direct appointment to the grade of assistant professor of women with very good studies and work experience abroad. Those women in other words who possess the vital scientific capital, which is further strengthened by the international recognition accorded to their scientific work.

2) The average waiting times of 9.5 and 8 years for female F.M. at the grades of assistant and associate professor respectively are high and reveal the difficulties for promotion to higher grades in the education hierarchy. In fact, we observe that these particular women remain in the same grade for a long period of time, approaching a decade. In addition it appears that some women are satisfied with this period of waiting in the grade of assistant professor and do not aspire to advance any higher in the university hierarchy. And,

3) Since a lot of female F.M. in the university field of E.C.E. are hesitant and do not dare to advance to the highest grade, the average length of time before they move up to the next grade for those who do decide to proceed approaches seven years. This is the highest permissible time limit a lecturer can choose before becoming eligible to move up a grade, because otherwise they are required to leave the university.

Qualitative Results

Difficulties which female F.M. face in the field of E.C.E. in Greece

The difficulties which female F.M. in the field of E.C.E. face focus mainly on two issues: a) the demands of an academic career due to the parallel demands of the role of the woman as wife and mother, and b) the existence of prejudices regarding the female gender which result in the unequal treatment of women in the academic field of E.C.E.

The demands of a professional career and the traditional role of women

From the answers of female F.M. in the field of E.C.E. there appears to be a dilemma between the choices of creating a family or pursuing a professional career within academia. A female F.M., at the grade of Assistant Professor, mentions characteristically:

'*the most important difficulty that we face is the combination of family and work, since the family demands a lot of time as does work in this field'.*

Another female F.M. at the grade of lecturer adds:

'*motherhood is a decisive factor which impedes women's activities at the University…'*

It seems, then, that there is a conflict of choices and women's attempt to move between personal space (creation of family – motherhood) and public space (work – career). As one female F.M. at the grade of Associate professor mentions characteristically:

'…this particular occupation has as a disadvantage for us as women the extreme exhaustion which is intense and many-sided and is not compatible with the demands of the family…the work conditions are very demanding….'

In addition, the extract below clearly presents the intense concern of one female F.M. at the grade of Professor, regarding the creation of a family and following a career in a demanding and extremely competitive branch of science:

'…the most significant difficulty for me is the balancing of motherhood and work. When I became a mother, and in order to continue my academic career, I began to work from the first day on the maternity ward where my son was born…besides, there is a lack of support for working mothers, an absence of nursery schools…in general, the situation in Greece…it has to be said that the creation of a family is a great difficulty for women in the University….if truth be told, I often think of giving it all up but I like my job and I decided that I didn't want to get left behind'.

The existence, then, of the dilemma motherhood/family or academic career reveals the existence of an internal conflict of roles on the part of female F.M., which is often noticeable in the phenomenon of the leaking pipeline.

Moreover, as far as appointment to administrative positions is concerned, the number of female F.M. who take up positions as Dean or President of Department is small. There are two women from the grade of Professor who took up these particular high administrative positions. In addition, out of the 12 women who participated in the telephone interviews 3 women had served as Head of department. In fact, the female F.M. in the academic field of E.C.E. consider their appointment to administrative positions as an additional difficulty and attempt to avoid it since it increases their workload. In addition, for some of them, the administrative posts are associated with the field of power from which they endeavour to dissociate themselves:

'.....objectively speaking, I can't take on an administrative position because I'm at a low level of the hierarchy, but even if I had the opportunity….I don't have time to combine writing, lessons, family and administration. There's not enough time….' (female F.M. at the grade of Assistant Professor).

And again:

'...I'm not interested in administrative posts, they are positions of power and generally I am not, by nature, at all interested in power…' (Female F.M. at the grade of Associate Professor).

A further problem which some female F.M. appear to face in the field of E.C.E. is their

feeling of the difficulty if not their own inadequacy in creating the necessary scientific capital (pure and institutional) in order to move up to the highest levels of the university hierarchy:

> '*…you won't believe it, but in order to write a paper a few years ago, when the children were small, I left them with my mother and my husband and I went to a hotel for a week. It was impossible for me to write at home…'* (Female F.M. at the grade of Associate Professor).

What's more:

> *'…and then we have to take part in conferences. When they are in Greece it's not too bad, although even then it can be difficult. But abroad…that's a lot more difficult. Where can you leave the children? Difficult…very difficult. I believe that in order to be able to work properly in this field you have to work on a masculine level. For example, my married male colleagues don't have any problem going away to conferences…'* (Female F.M., Professor).

Prejudices and the approach to women in relation to the female role, in the academic field of E.C.E. in Greece

One significant difficulty which female F.M. face in their professional career in the academic field of Electrical and Computer Engineering in Greece, appears to be the prejudices and stereotypes regarding their gender. The women who do manage to enter traditionally male dominated and demanding areas of work, like the academic field of E.C.E., appear to experience unequal treatment, both directly and indirectly, when compared with their male colleagues:

> *'There are always 'indirect' doubts concerning the ability of a woman to meet the obligations of this work, so this ability must constantly be doubly confirmed in a very clear manner.'* (Female F.M., Associate Professor grade).

And still:

> *'…..there is the constant belittling of women who make up the minority in the specific field. Especially in meetings where the number of women is very small, say 3 or 4, they don't face a problem when they agree to everything. In other words they say 'yes, men'…'* (Female F.M., grade of Professor).

The unequal treatment of Female F.M. presents itself in various forms, like:

> *'…I'm under the impression that prejudices exist in the area of research funding, when it's women who practice the profession of electrical engineer for computers. And that's apart from the few grants for research and the lack of state support and funding for programmes…*' (Female F.M. Associate Professor grade).

Discussion

The presence of female F.M. in the Departments of Electrical and Computer Engineering in Greek Universities reveals the existence of horizontal discrimination in the academic profession concerning the concentration of women in the fields of Social and Humanistic Studies, Health Sciences and/or the Fine Arts and their scant presence and under representation generally in the sciences and in particular in the field of E.C.E. (Sianou-Kyrgiou, 2007). The same is true of the distribution of female F.M. in the four grades of the academic hierarchy. This fact reveals the existence of vertical discrimination in the academic profession as well, which results in women's increased participation only at the lower academic levels. These

findings, which concern the field of E.C.E. in the case of Greek Universities, accord with the findings of other research which reveal a similar picture in the international field (Bagilhole, 2007; Bebbington, 2001). Thus, the academic field of E.C.E. in Greece does not appear to be particularly 'friendly' for female academics, since it retains a strongly gendered character which favours the career progression of men (Bourdieu, 2007, p. 172).

More specifically, from the interview excerpts ~~we~~ presented, it appears that female F.M. in the field of E.C.E. fight hard to manage to keep their academic posts – positions of prestige and power. In particular, Bourdieu (2005, p. 38) points out that the scientific struggle is an armed struggle between adversaries and the most important weapon required in order to take part in this struggle is accumulated scientific capital. However, women enter the academic field of E.C.E. in Greece with the 'feminine habit', a gendered habitus which is the product of a work of building, theory and practice. The natural and social order of the world, within the normalities of its operation, engraves dispositions and uses the biological differences between the sexes as a basis for social differences. Hence, as a natural consequence, women frequently face exclusion (at least to some extent today) from positions of prestige and power (Bourdieu, 2007, p. 64-65). The phenomenon of the leaking pipeline is characteristic. In other words, the premature departure of women from the academic field for the sake of their family commitments, constitutes a leaking of manpower from the academic tank (Walsh & Osipow, 1994, p. 238). This fact reveals the demanding nature of academic work in the field of E.C.E., a fact which hampers women's participation in it since they have to deal simultaneously with the demands of both work and family (Ward, 2008). Nevertheless, the female F.M. in the field of E.C.E. are members of an intellectual elite and are obliged to pay the price of this choice with continuous and perhaps extreme effort. Their progress, relative to the progress of men may well to a large extent maintain the social '*structure of distances'* as occurs in a handicap race (Bourdieu, 2007, p. 168-170).

The fact that more than half the females F.M.s in the field of E.C.E. in Greece attained postgraduate and doctoral titles abroad, as well as research and teaching experience at foreign universities, reveals that after the accumulation of the essential form of 'pure' scientific capital the way opens for some women to enter the male dominated field of E.C.E. (Bourdieu, 2005, p. 31-32). Additionaly, the entrance of a large number of women into the field of E.C.E. who either prepared a doctoral thesis in the same departments to which they were later appointed or had a previous working relationship in those departments, as academic associates or assistants, is pinpointed. In the latter case, it appears that together with the scientific capital which the specific women accumulated, they also shaped suitable 'social capital', which functions as a 'resource' and creates for them a positive network of social relationships which contributes to their integration into the academic field of E.C.E. (Bourdieu, 1994, p. 91-95). Under the above conditions, an important role was also played by the transitional clauses of Law 2268/1982 (Poulis, 2007), which introduced democratic entry criteria for the hierarchical grades of tertiary education and facilitated a significant number of scientists, and consequently women too, in their transition to F.M. in Greek Universities.

Although some women managed to get into the 'male dominated' field of the Departments of E.C.E., this happened at a relatively advanced age and since then there appears to be a slowing down of the progression of their academic career since the average length of time they spend at each grade is large (from 6.6 to 9.5 years). This phenomenon appears with strength in the international bibliography and is connected to a large number of other factors such as the women's family commitments, the manner of their socialization which contributed to the formation of a gendered habitus which does not encourage them to lay claim to positions of power, the micro politics which treat women as unequal, the existence of a hidden gendered curriculum and their limited number of publications in contrast to their male colleagues (Anastasaki, 2007; Eliasson, Berggen & Bondestam, 2000). It would appear that these factors

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also operate within the field that we examine. To put it in another way, since a lot of the Greek female F.M. in the university field of E.C.E. are hesitant and do not dare to advance to the highest grade, the average length of time before they move up to the next grade for those who do decide to proceed approaches seven years. This is the highest permissible time limit a lecturer can choose before becoming eligible to move up a grade, because otherwise they are required to leave the university. What's more, this time period is more than double the minimum amount of time required at the grades of assistant and associate professor. Consequently, there appear perhaps to be some unseen obstacles in play which interrupt the upward progress of women in the university field. This is because it would seem that academic women *who* manage to enter the university as F.M. then face '*sticky ground…a glass ceiling and in between a very rocky path'* (Anastasaki, 2007; Toren, 2001). In addition to this, we should point out that according to Law 1268/1982 permanent tenure at the level of assistant professor is guaranteed, following the candidate's successful evaluation (Poulis, 2007). It is possible that this professional security reduces the demand for high hierarchical positions on the part of women and it reveals a cover up: '*The fact is that while to all intents and purposes there is equality everywhere, women occupy fewer privileged positions'* (Bourdieu, 2007, p. 169). What's more, the long waiting period at the grade of assistant professor reveals the difficulty and perhaps the indecisiveness of the particular female F.M. to aspire to reach the top of the university hierarchy.

Finally, from the opinions of the women, which are presented above in the sector of the "prejudices and the approach to women in relation to the female role" in the qualitative results, as far as their treatment in the particular field is concerned it becomes clear that under the pressure of the structure of the field, which is male-dominated, they occupy 'bad' in other words secondary and non privileged posts within it (Bourdieu, 2005, p. 34). There is in other words a 'negative symbolic factor' which is none other than their gender and which has a negative affect on the field of E.C.E. since it is connected with the more general gender based distribution of labour in western societies (Bourdieu, 2007, p. 171-172). In any case, as Maruani (1989, p. 15) eloquently observes: '*Work is always differently introduced according to whether it's carried out by men or women'*. That's also why the definition of a post with prestige within a field, like E.C.E., mainly connotes the male presence which to a great extent forms an obstacle to women taking it up (Bourdieu, 2007:123).

Conclusions

According to what we have examined above, we arrive at the following concluding remarks.

- Two significant factors, which favoured the entrance of a large number of women into the field of E.C.E. were: a) the attainment of postgraduate and doctoral titles abroad, as well as research and teaching experience at foreign universities. And b) the preparation of a doctoral thesis in the same departments to which they were later appointed, as well as a previous working relationship in those departments, as academic associates or assistants. Moreover, the entrance of the female F.M. in the Departments of E.C.E. in Greek Universities happened at a relatively advanced age and the progression of their academic career was a slowing down because of the average length of time they spend at each grade is large.
- In the field of E.C.E. in Greece, the social structural differences between the sexes still survive. This fact creates difficulties for the career progression and professional development of women, who also face difficulties in their work due to their commitments to the fulfillment of the demands of the role of mother. More specifically, the most significant difficulties which female F.M. in the field of E.C.E. in Greek Universities encounter are the dilemma motherhood and family or career, which is connected to the traditional role of women and the continuing existence to some extent in a lot of areas of Greece of patriarchal structures. Family commitments

seem to constitute a barrier to the assumption of administrative posts and the formation of the essential scientific capital (pure and administrative), which would secure the rapid academic progression of female F.M. in the Departments of E.C.E. It is a matter, in other words, of the existence of a disharmony between university posts and established dispositions (habitus) on the part of women, which does not aid their entrance into and rapid advancement within the field of E.C.E. A significant difficulty factor for female F.M. in the Departments of E.C.E. in Greek Universities is the prejudice concerning the female gender, which results in the unequal treatment of women in the particular field which is dominated at a local and international level from a "men – centered culture". It seems that women F.M. undergo the pressure of the structure of the particular academic field in the Departments of E.C.E. that is determined by the specific weight of scientific capital to whom are activated in the field (men and women).

To conclude, it seems that the field of Electrical and Computer Engineering in Greek universities is governed by a strongly gendered character and even today presents a picture of the gender based division of labour, without moderating it at all. In addition, it maintains the 'social structures of separation' between the two sexes, which influence the professional development and career of female F.M. within the particular field.

Note

With the enactment of Law 1268/1982 the mode of operation of the contemporary Greek university was formulated. More specifically, the following gradations of the teaching staff were established: lecturer, assistant professor, associate professor and professor. This law did away with the institution of the chair and shaped suitable democratic conditions for the appointment to posts on teaching staff of young scientists and women.

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Advised by George S. Mihalakopoulos, Boston University, USA; Higher School of Pedagogical and Technological Education at Thessaloniki, Greece

Received: *January 25, 2012* Accepted: *March 02, 2012*

Anny Assimaki	Lecturer, Department of Primary Education, University of Patras, Panepistimioupoli, 265.04 Rio Patras, Greece. Phone: +302610997380. E-mail: asimaki@upatras.gr Website: http://www.elemedu.upatras.gr/index.php?section=589
Gerasimos Koustourakis	Assistant Professor, Department of Educational Sciences and Early Childhood Education, University of Patras, Panepistimioupoli, 265.04 Rio Patras, Greece. Phone: +302610969825. E-mail: koustourakis@upatras.gr Website: http://www.ecedu.upatras.gr/services/site/prosopiko.php
Konstantina Papaspyropoulou	Teacher Phone:+302610450693. E-mail: konstanpapa@gmail.com