

# GENDER DIVERSITY FROM THE SLOVAK AND GREEK PERSPECTIVE

D. Caganova<sup>1</sup>, O. Moravcik<sup>2</sup>, J. Stefankova<sup>3</sup> and J. Veresova<sup>1</sup>

Institute of Industrial Engineering Management and Quality<sup>1</sup>  
Division of Academic Activities<sup>3</sup>  
Faculty of Materials Science and Technology STU  
917 24 Trnava, Slovakia

M. Gialabouki and Ch.E. Lekka  
Materials Science & Engineering, University of Ioannina,  
Ioannina 45110 Greece

**Abstract— Diversity is a principle of natural and cultural life. It also applies to engineering education. Today young women often perform better at school than young men [1]. Unfortunately, women in scientific research are still a minority today. The evaluation of research programs depends on the gender perspective. More women should be involved in decision making because women might perceive some objectives and strategies differently from men. Every contribution, every new scientific result that helps making engineering education better is welcome. In general women are underrepresented in all engineering fields and in all European countries, but the situation of women in sciences varies from country to country. To ignore women's purchasing power is a dangerous strategy [2]. This article shows the career chances of women in science in Greece and Slovak Republic.**

**Keywords-***diversity; gender; equality policy; academic careers.*

## I. EQUALITY AS A PRINCIPLE AND AIM

The equality between men and women in Slovakia is part of the fundamental rights and attributes of democracy. The principle of equal treatment of men and women is guaranteed by the *Constitution of the Slovak Republic* [3]. Slovakia's current legislative and regulatory framework is more or less compatible with EU legislation, which explicitly defines equality between men and women as one of its core values. All EU gender directives were transposed into the legislation of the Slovak Republic and have considerably helped to reinforce the gender equality principle in everyday life.

The Gender Equality Principle was introduced in the Greek Constitution in 1975 and established in Eighties with the creation of a legal framework that addresses equality between men and women. In 2001, Constitution revisions were made to establish the State's obligation to take appropriate measures to eliminate all discriminations, Article 116, paragraph 2: "the adoption of positive measures for the promotion of equality between men and women does not constitute gender discrimination. The State is responsible for the elimination of existing inequalities, especially if they are against women". The National Collective Labour Agreements of 2002-2004, affecting employees in the public and private sector, introduced gender equality practices including paternity and parental leave. Law 3250/2004 boosts employment of mothers with underage children, by offering the possibility of their being

employed at a 10% quota in positions of part time employment in the public sector, legal entities operating under public law, as well as in organizations of local government, in services of a social character. [4-7]

## II. INSTITUTIONAL GUARANTEE OF GENDER EQUALITY POLICIES

Institutional mechanisms to provide gender equality policies are not stable and are very often changed and transformed. The gender equality agenda has been an official institutional agenda in the Slovak Republic since the 1990s. First time that the term "gender policies" became part of the political structure was in 2005 when "equal opportunity" department was again transformed into the *Department for Family and Gender Policy*. In 2006 changed the approach to the institutional provisions of the gender equality agenda. An independent department for gender equality and gender opportunities was established. The department is under direct supervision of the minister, which indicates a shift towards greater importance of the agenda.

In Greece, the General Secretariat for Gender Equality was established in 1985, initially at the Ministry of Presidency of Government and subsequently at the Ministry of the Interior, Public Administration and Decentralization, as the competent institution for the promotion and realization of legal and substantial equality between men and women in all sectors (political, economic, cultural). In addition, Prefectural committees for Gender equality established by the representatives of national and local bodies and by women's organizations in each Prefecture, as well as Prefectural Offices for Gender Equality for the purpose of better citizen information at a regional level. [4]

## III. A BRIEF EXCURSION TO RECENT HISTORY AND TO ATTITUDES TOWARDS THE POSITION OF WOMEN

During the socialist era, the position of women and their emancipation was the result of top-down political decisions. It was not the outcome of the fight for women's rights or the women's movement, as was the case in western societies. After the fall of state socialism, the position and role of women in society and the family began to be the subject of a broad public debate. Women had to face a new social pressure to return to

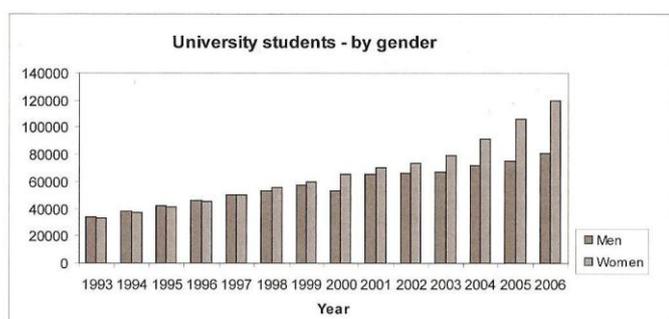
their traditional role - caring for family and children. A number of public representatives had welcomed the democratization process as a great opportunity for women to stop working and return to households. Fortunately, this approach did not find a significant number of women followers. This public discourse can be viewed very positively since it became a tool for disrupting the deep-rooted stereotypes in gender roles in the society. Women's income was considered as being only supportive, additional to the family's budget, even if the double-income family model was (and still is) an economic necessity for the majority of families.

In Greece, women were educated in science and philosophy almost equally as men, already back to 7<sup>th</sup> century BC. Nevertheless, up to the beginning of 20<sup>th</sup> century the Greek women are out of this game. During the first half of the 20<sup>th</sup> century the scientific area opens slowly to female scientist, while in 70's and 80's rapid changes occurred. The Greek culture also supported the idea of the traditional housewife but the number of the educated parents increased this idea fade. That lead to the exponentially increase of the number of females who try and manage to pass the National exams in order to enter in the Universities. In early 90's the postgraduate courses as taught courses are established in the country and these provide the pool from which Greek women are recruited for research.

#### IV. WOMEN AND EDUCATION

Presently in Slovakia the educational level of women is fully comparable to men's. A steady growth of university students (especially women) has been recorded since the beginning of the 1990s. In 1997 for the first time the number of women studying exceeded that of male students, which is considered to be a breakthrough in terms of student gender structure. One of the interesting phenomena is a rapidly increasing number of female students taking external form of university studies.

The number of female students was also affected by the increasing number of universities and colleges. In 2006 there were 20 "high level" education bodies in Slovakia, of which 17 were universities and 10 were private colleges.



Remark: Data covers university students in all forms of study. Some students could be enrolled in more than one university.  
Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statistik/index.html>

**Graph 1:** University students by gender in Slovak Republic

The higher proportion of women among students results in a higher proportion of female graduates. The structure of graduates by field of study provides evidence of the relatively strong and deep-rooted horizontal gender segregation by field of study.

A comparison of the structure of female graduates over a period of several years does not confirm the hypothesis that the higher proportion of women among students leads towards reinforcing their interest in studying typically "female" subjects. The comparison in the table below shows that the gender distribution of graduates is relatively stable despite the increase in the total number of male and female graduates.

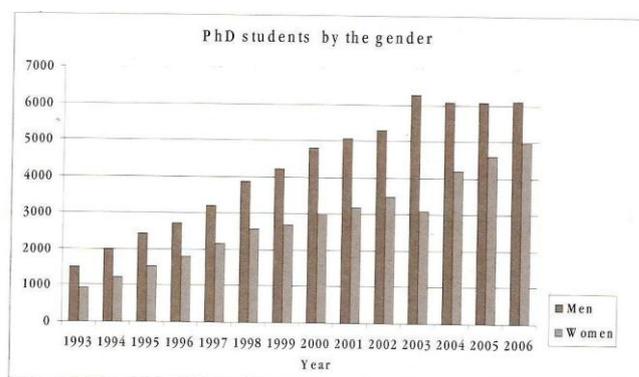
According to the data in Table 1, there have been some shifts in the structure of female graduates. The most noticeable digression is from cultural sciences and humanities and there is a slight increase in technical and agricultural sciences.

**Table 1:** University Slovak female graduates in 1999 and 2005 by branch of study

Study programme	1999		2006	
	Abs.	Rel.	Abs.	Rel.
Natural sciences	444	4.7	1,013	5.1
Technical sciences and informatics	746	7.9	2,042	10.3
Agricultural sciences	227	2.4	1,014	5.1
Medical and pharmaceutical sciences	1,063	11.3	2,239	11.2
Social sciences	6,179	65.5	12,973	65.2
Cultural and humanities sciences	772	8.2	500	2.5
Military and defence sciences	-	-	123	0.6
	9431	100.0	19,904	100.0

Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statistik/index.html> and National Policies on Women in Science in Europe, EC March 2002, s. 127,+ author's calculations

A similar increase was observed in doctoral studies. The increase in the number of doctoral students was not as linear as in the number of graduate students, and it was different for men and women. While the number of female students in doctoral studies remains stable, statistics recorded from 2003 onwards show a decline in male students interested in this form of study. The discontinuity in the number of female doctoral students was noticed in the same year. These trends could also have been affected by legislative changes concerning the social and economic status of PhD students.



Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statistik/index.html>

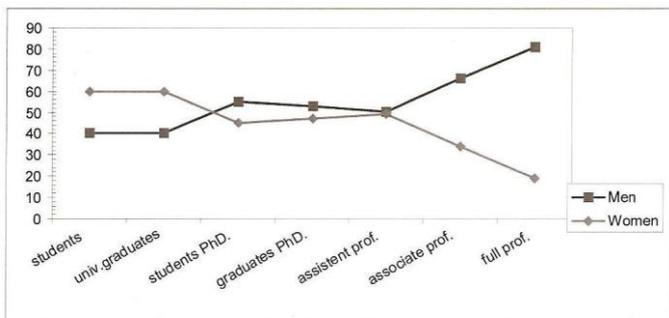
**Graph 2:** PhD students by the gender in Slovak Republic

**Table 2.** Percentage (%) of the number of male and female as a function of Bs, Ms and PhD degrees from 2002 to 2006 in Greece.

Academic year	Bs		Ms		PhD	
	Male	Female	Male	Female	Male	Female
2002-2003	37.01	62.99	45.95	54.05	62.94	37.06
2003-2004	36.00	64.00	42.66	57.34	65.02	34.98
2004-2005	35.71	64.29	47.65	52.35	72.06	27.94
2005-2006	35.67	64.33	41.03	58.97	59.65	40.35

In the beginning of the 20<sup>th</sup> century the target of increasing the female university graduates has not only achieved but the number of female Bs holders is higher than that of male, Table II. In addition, from the available statistical data it comes out that the number of Ms female and male graduates is almost equal with a small increase for female in the academic year 2005-2006. On the contrary, when comparing the PhD graduate students, the number of female drops and the male raise by as much as 60%, Table 2. These results suggest that although a lot have been achieved during the last decades concerning the educational level of female, there is still a lot of work to be done especially in the highest level of PhD education. It appears therefore that most of the 25-30 years old women decide to stop their studies and either start working or most often to devote themselves to their family and their children. Unfortunately, this situation remains unaltered in 2010, especially for the male dominant Departments like the Materials Science and Engineering in Ioannina in which among 92 PhD students 73% are male and only 27% are female. [8]

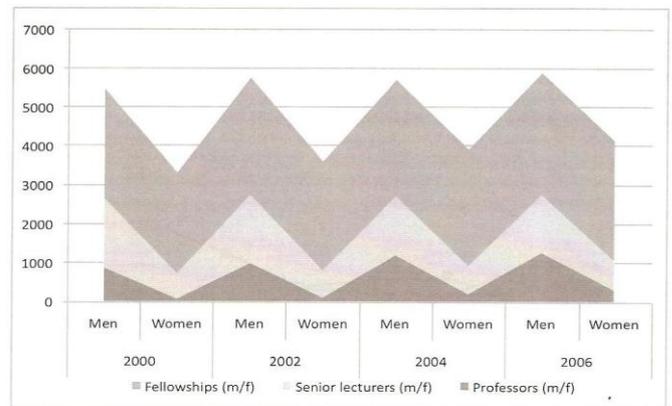
**V. ACADEMIC CAREERS OF MEN AND WOMEN**



Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statist/index.html>

**Graph 3:** Comparison of men and women academic careers in Slovak Republic in 2006 [9]

Graph 3 shows that women in Slovakia in 2006 represent a higher proportion of the total number of university students and graduates. A certain breakthrough point is evident in doctoral studies. PhD study represents a critical period for women and for their professional start in an academic field. This fact is linked mainly (but not only!) to women’s life cycle. At the “assistant professor” level, the gap between men and women closes again.

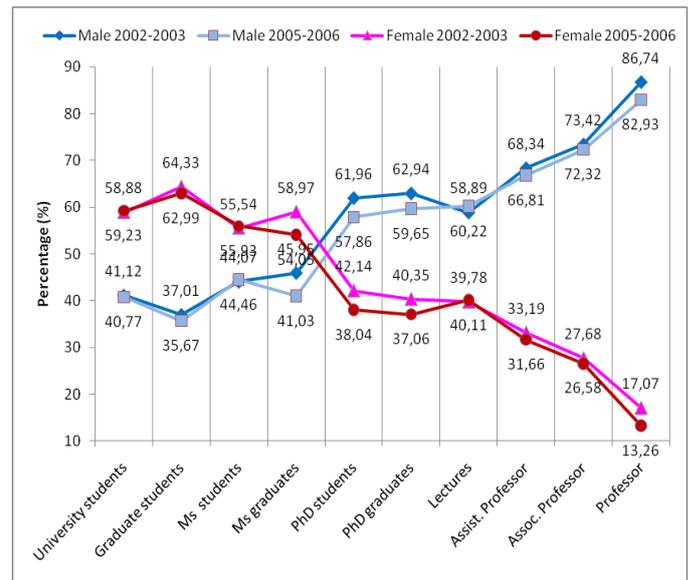


Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statist/index.html>

The adverse development in the research personnel capacity reflects the same tendency in the financing of research. The S&T expenditure between 2001 to 2005 increased in absolute terms by 50 million euro, however, the GDP contribution on S&T in the period mentioned declined from 0.63 % to 0.51 % of the GDP. This value is far below the 3 % GDP contribution to research, which is the target of the EU. The biggest drop in S&T expenditures

**Graph 4:** A gender structure of university teachers in Slovak Republic

There is a very slight gender shift in the highest academic posts recorded in 2001 and 2006. The Graph 5 maps the number of university teachers since 2000, and proves this fact. The proportion of female university teachers oscillates at the level of around 10 - 15 % for a long time. A distinct change was recorded in 2006, because the proportion of female professors climbed up almost to the level of 24 %. However, it may be too early to state whether this change led to a start of a continuous growth in the number of female university professors, or whether it is the result of a synergistic effect, combining several factors.



**Graph 5:** Percentage of male and female in different levels of scientific career in Greece

Similarly to the results of 2006 from Slovakia, in Greece the period between the Ms and PhD studies is very critical for Greek females, too. The scissors diagram, graph 5, graphically represents the gap between genders for the different levels of

their academic career as a function of time (years 2002-2003 and 2005-2006), [8]. It is clearly seen that the females dominate the University, Bs and Ms Studies, while upon the PhD studies the opposite is true. This gap start to increase in the Lecturer lowest University Professor level (60% males over 40% females in the year 2005-2006) to gradually enhance up to 87% male occupation in the higher Professor level. This suggests that although Greek women may achieve to get a University professor position the higher possibility is to get it in the lowest level (Lecturer) rather than the highest Full Professor level. It worth's to be noted that this diagram includes statistical data from several Departments and Universities in Greece, including the female dominant Departments like Philology and the male dominant Departments like Physics. For this reason, one would expect that this situation would be different when looking separately the different Departments. In Table 3, we present data taken from several Departments of the University of Ioannina in 2010-2011 concerning the number of male/female Lecturers and highest level Professors. We see that the number of male been Professors is dominant in Departments like Physics, Materials Science and Computer Science, as expected; interestingly, this situation persists even in Departments like Philology, History and Primary Education. In addition, when present the female most usually occupy the Lecturer position, while in some departments like Physics and Computer Science are absent from both levels. It is easy to understand that despite the culture of the country having more male in the highest professor level results their occupation in the important administration and management university and institution decision-making positions.

**Table 3:** Percentage of male and female in the University of Ioannina Departments in Greece

University of Ioannina Departments	Professors		Lecturers	
	Male	Female	Male	Female
Materials Science & Engin.	100	0	75	25
Physics	92	7	100	0
Chemistry	80	20	71	28
Computer Science	100	0	100	0
Mathematics	100	0	75	25
Biological Appl. & Techn.	50	50	50	50
Medicine	85	14	66	33
Environmental Manag.	71	28	50	50
Business Admin. Agricult Prod	100	0	60	40
Philology	80	20	16	83
Philosophy, Educ & Psych	87	12	50	50
History and Archaeology	44	55	40	60
Primary School Education	75	25	25	75
Pre-School Education	50	50	60	40
Fine Art & Art Sciences	100	0	50	50
Economic	100	0	85	14

## VI CONCLUSIONS

In both the Slovak Republic and Greece the gender equality principle was implemented in the Constitution around Nineties

and Eighties, respectively, followed by the scientific institutional or university level mechanisms. Although the situation of women scientists between the two countries is pretty similar some differences may emerge. In the case of Slovakia, which past a period of socialism, women have better representation in science taking into account the gender equality in assistant professor level and the increasing rate of women university teachers in 2006. In the case of Greece, which always had democracy, the women's position seems to be worse. Nevertheless, both countries agree that Bs females are more than males while the graduate studies is a critical period where this number is reversed starting from the PhD candidates. The situation becomes worse at the higher academic positions while the scientific education and academic career of male and female follows a scissors diagram. It has to be noted that since the male dominate the high academic level they will therefore occupy all the university decision-making positions. This situation is quite similar to other European countries like Slovakia and Greece; the main reason is that usually women decide to give their effort to their family and most of them are not competitive and prefer to leave men being in front in the scene

**Acknowledgments:** This work was supported by the FP7-SiS-2008-1 (No 230253), 2009-2011, "Improving the gender diversity management in materials research institutions", Diversity project.

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