forms of laboratory organizations, computers in science laboratories, amusing and mental experiment, and so on.

6. Internet and Computers in science Instruction
This is the modern and attractive part of the system: use of the calculators (including programming calculators) in teaching, different types of educational software for teaching (software for laboratories, for solving problems, for evaluation and self-evaluation, animations and simulations, educational games, and so on), different ways and modes of Internet use in the teaching, basic principles of educational software creation, problems of the development of mixed methods without and with computer, problems in teaching educational informatics for teachers and students are analyzed.

7. Systemic Approach to Science Teaching
There is the general ways of using the systemic approach and structuring of the teaching material: visual methods and models of knowledge, schematic structuring of teaching information, different types of schemes in science teaching (program schemes, schemes of educational content, schemes - algorithms), design of the schematic visual materials by teachers and students, methodology of the use of the schematic visual materials.

8. Educational means of teaching and learning and textbooks
The subsystem of different educational means of teaching (audiovisuals, transparences, slides, films and videotapes, natural objects, collections, chemical substances, models, glass apparatus) and methodology of their elaboration is very important. Modern textbooks and different means based on printed materials with some examples, and composition of systems of different educational means of teaching are analyzed.

9. Construction of knowledge and history of chemistry in teaching
In this part the constructivist approach, the influence of the previous knowledge and matters of Chemistry history in the teaching are analyzed.

10. Modern organization of classes and extra class activities in Science
The organization of different forms of classes is in this subsystem: (collective work, conferences, workshops and seminars, extra classes, virtual classes, excursions, courses of special interest), educational games, active methods of art, literature, poetry and music, amusing material and humor in the classes, physical, chemical and biological theatre performances, schools and societies of the science youths and the investigations of the students, science Olympiads in their different levels.

CONCLUSIONS
The system of modern and active teaching and learning methods is based on the experience of different educational centers in different regions and various educational approaches. Using of this system can be useful for the difficult but vitally important work of improving knowledge and abilities of students in science subjects in different countries.

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The Gender Issue in the Teachers' Professional Development

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Abstract
This paper present some of the persistent gender issues that cause inequities in teachers' professional development and keep women away from heading up to the different levels of educational administration, although the majority of teaching personnel. The interest focuses on the under-representation of female teachers in leadership positions and the discussion argues on the barriers witch stall female advancement and exclude women from the main "leadership pipeline". The basic rationale is that women's role is crucial in order to face the new demands of school in a dramatically changing society carrying out a different style of leadership.

INTRODUCTION
In order to understand the recent changes in the professional status of teachers in Europe it is essential to consider the contribution of women to teaching and teacher education noting the proportion of women has always been high.

Education has traditionally been a "feminine" job/profession (similar to mother role, caring role, etc.) in Europe and western world. However the percentage of women pursuing and holding positions of leadership is extremely low and also declines at higher level of education.

The school demands have dramatically changed following the changes in society of late modernism. As a result the demand of the teaching profession has changed equally. New roles and skills/competences are required by the teachers, in all levels; they have not initially been trained for and new models of training should be fulfilled too. The teachers' professional development is a long and demanding process that requires individual and institutional involvement.

There is a variety of issues to be considered under the perspectives of the new challenges in education. Some of them are not new ones, such as gender equity and inclusion but others such as integration of ICTs in education and multiculturalism have relatively recently emerged.

This paper argues some of the persistent gender issues that cause inequities in teachers' professional development. The interest focuses on the under-representation of the female teachers in leadership positions (head teachers/ school principals/ supervisors/ counselors/ super intenders/ administrators/ policy-makers and decision makers) and the discussion argues on the barriers/ obstacles (external and internal) which stall female advancement in educational administration since it is assumed to have multiple effects on different levels.

"WOMEN TEACH – MEN MANAGE"?
It is disconcerting to think, throughout the years, issues of gender equity have virtually been ignored and therefore ultimately remain unresolved. The widespread rhetoric approaching the issues of gender equity within the arena of education administration masks a number of underlying assumptions that serve to maintain the status quo. For example, it is generally taken for granted that women make better teachers and men better managers, in other words, "women teach and men manage" (Gold, 1996).
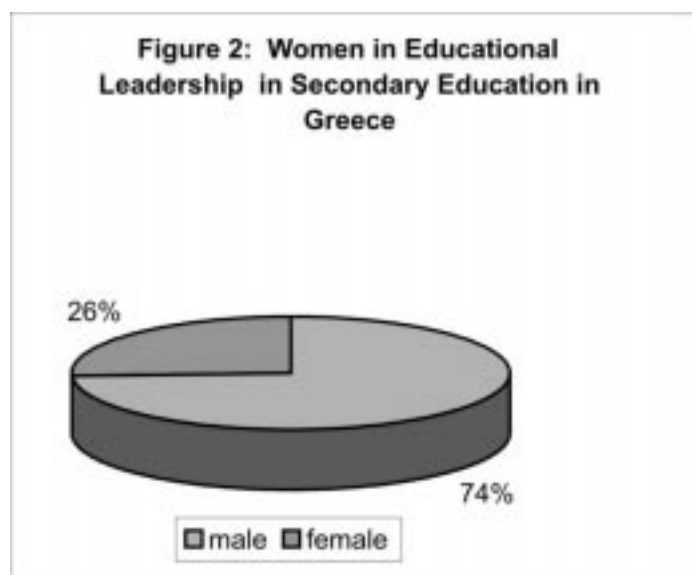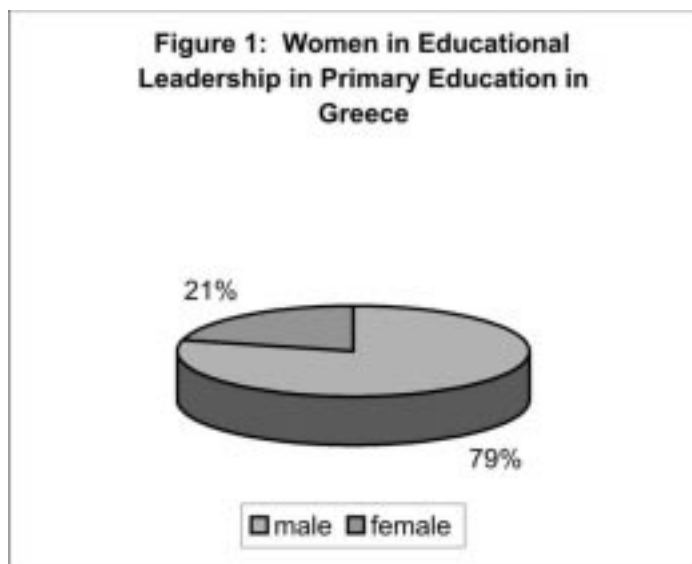
These assumptions or commonly held beliefs, are so embedded and nested, they generally remain unquestioned and unchallenged, resulting in taken- for- granted and unconscious behaviour patterns that become verified as "universal truths". In these assumptions inheres a world perception according to which the gender and equity issues are no longer considered to be a problem. It is assumed that organizational manifestation of equality, equity, fairness and honesty are the norm and that citizens are protected by the enactment of legislation, policies and mandates. This world perception/ view has made the issues of gender equity invisible (Hyles, 1992) and does not accurately portray the reality of women faced with impediments to success in the field of education administration.

The following table and figures (1 - 2) of quantitative data present the proportion (percentage) of women and men holding leadership positions in Primary and secondary education in Greece and demonstrates the

persistence of the females' under- representation in educational leadership and administration and reveal that the Greek case keeps up with the tendencies of the known reality in the developed countries.

Sectors	School counsillors/ advisers/supervisors	Superintenders heads of geographical districts	Heads for scientific and pedagogical guidance	Heads of education	Heads of local educational authorities	Total	%
Primary education	366	13	13	58	146	596	
Male	253	13	12	55	137	470	79
Female	113	0	1	3	9	126	21
Secondaryeducation	261	13	13	58	75	420	
Male	175	13	9	54	61	312	74
Female	86	0	4	4	14	108	26

Table: Leadership positions in Primary and Secondary School Education in Greece

Source: Ministry of Education and Religion Affairs, Greece, 2002-2003.

Figure 1: Women in Educational Leadership in Primary Education in Greece

Figure 2: Women in Educational Leadership in Secondary Education in Greece

BARRIERS WOMEN FACE

Some well-known barriers to women's participation in educational administration that have been cited in the literature, are the following:

• sexist and sex-role assumptions and attitudes regarding women administrators' ability and competence to perform the role (FUNK, 1986, SHAKESHAFT, 1987),

• the masculine culture of educational institutions, such as schools (BLACKMORE, 1989, BLACKMORE, 1995),

• women's reluctance to apply for promotion (RANDALL, 1994),

• lack of adequate childcare and of support system (SCUTT, 1990),

• dual role of performing unpaid work in the home, rearing children and working in the workplace (DAVIES, 1994),

• lack of traditional mentoring opportunities for women (RANDALL, 1994),

• lack of access to socialization processes, which limits women from aspiring to leadership positions (JACOBS, 1994),

• separate promotion routes for teaching and educational administration, which are two distinct professional roles (NICOLL, 1992),

• promotion by merit is not a neutral concept but based on the values of the dominant group in the organization, which is typically the group of men (BURTON, 1987),

• the "glass ceiling" originally described by MORRISON, WHITE and van VELSOR (1987) includes a cluster of barriers: a lack of role models and mentors, lack of support from senior executives, increased competition and competing career and family roles.

The most frequent barrier cited in the literature is the lack of support, encouragement and counseling from relatives, friends, coworkers and superiors. Despite their excellent qualifications and aspirations, "women seemingly remain in those positions that are viewed more as the "behind the scenes" jobs that require long hours, little power and less pay" (GUPTON and SLICK, 1996). The "good old boys" network is largely absent for women (MERCHAND & BROWN, 1991).

WHY SHOULD WOMEN GO INTO EDUCATIONAL MANAGEMENT?

There are several reasons to support the encouragement of women to go into the educational management or administration.

·   One is of simple *equity*: women should have the same access to power and resources as men;

·   Another is of *style*: it is argued that generally women manage to lead differently from men and that bring a clearer set of values about developing and supporting colleagues/students and a closer understanding of interpersonal relationships than many men do (GOLD, 1996).

·   Yet another is about *role models*: boys and girls, men and women as well, should have the opportunity to be led by women also, in order to begin to understand that women can take positions of power and work with them effectively but differently from men.

WHAT DO WOMEN BRING INTO EDUCATIONAL MANAGEMENT?

It is argued that women managers in education distinguished by an ability to develop and share a vision, a commitment to collaborative decision-making and a view of themselves as coordinators who develop and encourage others to the benefit of all. So, on the whole, women bring a different style of management in education, one that fosters relationships and growth (GOLD, 1996).

Although most of the research focuses on leadership in educational administration has been based on the experiences of males (especially white), it is important to mention that there are also few quantitative studies concerning leadership and women as well (HOTKAMP, 2002; TROEN & BOLES, 1992). Despite different cultural and ethnic backgrounds, years of experience, and age differences, different educational systems, in these studies has been brought into focus that all these women, holding leadership positions, face the same challenges and share a relatively common set of values, and common characteristics. Some of the characteristics identified are: drive to achieve, use of spiritual values, involvement in professional organizations, involvement as a community leader, and valuing personal relationships.

CONCLUSIONS

In order to offer a "women-inclusive" administrative model a re-conceptualization of research, theory and practice taking the feminine perspective into account is necessary alongside with the solutions proposed by feminist writers. For example, liberal feminist literature, concerning women under-representation, has focused on redressing discrimination

through avenues such as affirmative action policies and practices, more accessible mentoring and socialization processes and a range of training opportunities and/or courses. Radical feminists contend that more basic solutions are needed rather than simply revising current political, legal and educational policies and practices. Blackmore (1989, p. 123) argues that "the concept of leadership needs to be re-examined in order to transform its current "masculinist" bias, which emphasizes control, hierarchy and individualism".

At a time when our educational system is in the midst of major upheaval and transformation, we cannot ignore or subordinate the talents of any who are within the educational community. The leadership of the 21st century must not depend on a "good old boys" network nor the "good old girls", but the "good old people" system dedicated to quality education for all learners. As Francis Hesselbein notes, "in the end, it is the quality and character of the individual that defines the performance of great leaders".

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The use of the concept map and the mathematics' teaching for the investigation and evaluation of the prospective teachers' attitudes towards physics

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Abstract

This paper presents some of the results that have come out of the use of the concept map that the students of the Pedagogic Department of the Aegean University face in relation to the Science of Physics (S.P.).The purpose of the research was to identify the students' primary attitudes about the concepts of S.P. and to investigate the newly formed attitudes about the subject of S.P. after the teaching of the Mathematical concepts that are needed in S.P. by the Physics. Teacher. The concept map was used as the tool for the research.

Key words: *evaluation, physics, mathematics, heat, prospective teachers.*

INTRODUCTION

1. Concept Mapping

A concept map is a visual tool for representing knowledge relationships and structures and has been used as a didactic and pedagogical tool to help students "learn more meaningfully" and form a "conceptual understanding of the subject" (Novak, 1990 & Mwakapenda & Adler, 2002).

Concept maps have been also used for assessment of students' knowledge structure and its implementation in science education (Novak, 1990). Research shows that understanding a subject domain, included in the science curriculum, is associated with a concise and complete set of relations among the different concepts of the specific domain (Novak, 1998; Novak & Gowin, 1984; Novak, Gowin, & Johansen, 1983). The close scrutiny of these relations may help the evaluation of both the students and the course itself.

Concept maps are represented by network diagrams in which the various concepts are nodes and the relationships (associations) between concepts are links. The concepts are essentially nouns and the relationships between them are verbs.

The lines are drawn between pairs of concepts to represent the kind of relationships between the different concepts while the linking words (labels) on the lines indicate the way (nature) the pairs of concepts are related. The proposition is defined as the set of the two nodes and the linking word between the two nodes and this is the fundamental unit of the concept map (Ruiz-Primo & Shavelson, 1996).

Research (Jonassen *et al.*, 1998) has shown that concept mapping is a measure of structural knowledge, that is, that there may be a relationship between what is actually known by the learner and the external representation of this knowledge as a concept map Consequently a concept is a representation of how key concepts in a domain are mentally organized/structured by students.

There are mainly two concept mapping techniques.

The "Construct-A-Map From Scratch" and the "Fill-in-the-Map".

Both techniques have as main purpose to evaluate the knowledge structure of the students but they differ on the constraints (directedness) they impose on a student in eliciting her representation of structural knowledge (Surber, 1984). Research on concept maps has focused on how the various concept mapping techniques affect the representation and interpretation of a student's knowledge structure. (María Araceli Ruiz-Primo *et al.*, 2001).

Construct-A-Map From Scratch. In this method the assessor provides information to the student and asks him/her to construct a hierarchical or non-hierarchical map. Students' response to this requirement by constructing a map, in their attempt to correlate all the concepts that concern a particular domain (María Araceli Ruiz-Primo *et al.*, 2001).

Fill-in-the-Map. In this method students are provided with a concept map where some of the concepts or the linking words have been empty and