



Preparing Young Girls for Science and Technology careers

Information booklet
for career counsellors





**Preparing
Young Girls
for Science
and Technology careers**
Information booklet for career
counsellors

IFAC PROJECT

Information for a Choice:
Empowering Young Women through
Learning for Technical Professions
and Science Career

Athens, June 2008

This information booklet is produced by E 2000 and EKEPIS

Adaptation: Dr. E. Karpodini-Dimitriadi

Scientific responsible: Maria Koutsafti, MSc., Career Counsellor
Director "V. G. & E. C. - Career Associates"

The final version will be available upon conclusion of the project IFAC
in the project's websites [www. IFAC-project.eu](http://www.IFAC-project.eu) and www.SET-career.eu

All rights reserved
Reproduction is authorised provided the source is acknowledged

The views expressed are those of the authors and do not represent the opinion
of the European Commission or any of its Directorates.

INTRODUCTION

This information booklet contains useful information addressed to career counsellors especially those working in secondary education (middle and high schools). It is based on the information collected through out the IFAC project and mainly during the seminars and the thematic workshops organised in the framework of the project, but also on results and observations included in the IFAC published report *"Promoting Young Women in SET: Lessons learned- A Cross-National Analysis of Past Research Projects"*, written and edited by Sara JOHN and Doris ARTZMANN, Vienna University of Economics and Business Administration (Athens 2008).

The booklet seeks to offer the necessary information to career counsellors in order to improve their qualifications in orienting young women towards SET career paths. The content of the booklet will be enhanced after the final conference and the 4th thematic workshop organised in Athens on 1st July 2008 and will be available online in the websites of the project (www.IFAC-project.eu and www.SET-career.eu).

IFAC: Information for a Choice: Empowering Young Women through Learning for Technical Professions and Science Careers is a European project financed by the European Commission within the 6th Framework Programme under the specific action "Science and Society, Women and Science". The Co-ordinated Action represents a cross-European partnership including organisations of various types in five different countries. These are:

- EKEPIS. National Accreditation Centre for Continuing Vocational Training (coordinator), Greece
- EVREMATIA AE (initial partner), replaced by E-2000, Greece
- Hellenic Association of University Women (SEE), Greece

- Centre for Social Innovation (ZSI), Austria
- University of Economics and Business Administration Vienna (WUW), Austria
- Norderpoort College (NPC), Netherlands
- Högskolan i Halmstad (HALM), Sweden
- Kungliga Tekniska Högskolan (KTH), Sweden
- Information Multimedia Communication AG (IMC), Germany

Based on available resources (statistics, surveys and analysis), which show that women are underrepresented in Science and Technology, the project seeks to identify the main reasons behind this situation and underlie the two most significant causes for female exclusion in the field of SET: the pre-existing stereotypes that reinforce male dominance in the workplace and secondly the lack or limited information about career paths. The project also seeks to address the issue of 'choice', among young women in their high school years, in the process of selecting a degree and career path. The target group concerned are young girls, age between 15-18 years old, a period in which usually they have to decide upon their further education and employment career.

It is very well known that in the Knowledge Society and the New Economy educational and career choices are very complicated and young people must be equipped with adequate information in order to make their career choices. School education and career counselling play a vital role at orienting young school boys and girls to higher education and professions, which could in turn offer better possibilities for professional advancement. Rapid technological changes and globalization have affected the organisation and the content of work, and both boys and girls opt for scientific and technological subjects in order to secure their "employability". However, although girls are considered to perform better during and after the end of their initial education, more boys than girls will follow

higher education studies in sciences and technology and even fewer will follow a career in SET. This phenomenon appears to be common in many educational systems and a series of surveys prove that schools have a responsibility for the discrepancy between boys and girls.

Worldwide surveys (e.g. OECD November 2006) show that, while women are not formally excluded from any level of education, nevertheless social stereotypes and traditional concepts for women's role create a status of informal exclusion of girls, thus guiding them to making different educational and professional choices than those of boys. Additionally despite the increasing demand for qualified personnel in research and technology and despite the high rate of women graduates from higher education, women are still under-represented in Science and Technology and are highly employed in traditional sectors such as teaching and office jobs.

Surveys note that the highest concentration of women in the field of research and industry is found in biology, health services, pharmaceutical companies whereas there is very low representation in sciences like physics, ICT and engineering. Among the 30 OECD member's states, approximately 50% of tertiary education graduates are women; but only 30% are in SET. Girls, even when they perform better than boys, do not opt to follow a career in SET. The reasons for that are numerous and the situation that has developed cannot change unless the barriers are unveiled, especially the long established stereotypes and the lack of accurate information. The IFAC project tried to contribute to this.

The main aim of this guide is to become a practical and useful tool for career counsellors assisting them to improve their skills and competences, and to cope with the new demands and efficiently perform their

assigned tasks in the educational environment. For the writing of the text experience gained through the various stages of IFAC project has been utilized.

The guide consists of two chapters: The first chapter presents some general observations concerning reasons behind the limited participation of young women in SET based on findings extracted from the report on past projects and researches analysis of IFAC project; the second chapter describes the new role of career counsellors and the competences and skills needed in order to be able equally to assist boys and girls in the career choices.

CHAPTER I

**Main reasons behind
limited participation
of young women in SET**



Young persons while trying to choose their future studies and career are under the influence of various factors. We name some of them, which are:

- the young person's gender and place in the family, which has a dominant role, especially to young girls, as a source of advise, guidance, values and views;
- the parental influence on sex roles stereotyping in relation to the cultural milieu and the socialization perspectives that conspire to turn girls away from science related careers towards careers that are more easily interrupted, less demanding and which require few educational pre requisites;
- the influence of the same sex, parent, and especially mother, in this case, is also crucial in projecting it to the choices a young daughter should make;
- the level of parental education;
- the socio-economic status; personality, belief system and the dynamics of family interaction or functioning incorporating parenting style, authoritarian or passive.

Classroom experiences is also a factor, which differentiates learning approach and achievement expectations, while girls very often are not given adequate **information** about career possibilities requiring competency in advance mathematics and/ or sciences, neither they are introduced to women role models with successful math and/or science careers, although in general **role models** can be an important factor in elevating a young person's aspirations. As a result many pupils held gender stereotypes attitudes towards a range of occupations, associating certain characteristics with a particular gender (for example, women are more caring, better at talking to people etc.; Men are stronger, fitter, more technical and practical).

Researchers found that part of the difference is driven simply by individual differences. However, a more significant difference is driven by societal or external

factors such as sex discrimination or sex typing of occupations, much of which young girls are unable to control in large part.

Studies and researches conducted during the last decades indicate the variety of reasons young women do not choose SET for academic and professional career. Among those identified the most important are:

- Gender and Societal stereotypes
- Lack of accurate information
- Structure of educational system.

As it is mentioned in IFAC's analysis¹ *"gender stereotypes and the lack of information are of course also interrelated: gender stereotypes are often caused by a lack of information; and a lack of information often is a lack of accurate information caused by the persistent circulation of stereotypes concerning SET as well as gender stereotypes"*. Furthermore the social environment in particular the attitude of parents plays a significant role in their educational and career decision making. As it has been emphasised during the 1st Thematic Workshop of the IFAC project² parents and especially mothers influence their girls to their educational choices, because studies in their perception are not necessarily associated with the employment, with the exception of certain fields such as medicine. Furthermore, mothers even in cases they encourage their girls to study mathematics and physical sciences, they keep reminding them the problems of reconciliation of family and working life thus orienting them to other domains than SET. Of course many factors also intervene such as the social-economic status and the cultural standards of the family.

¹ See *"Promoting Young Women in SET: Lessons learned- A Cross-National Analysis of Past Research Projects"*, written and edited by Sara JOHN and Doris ARTZMANN, Vienna University of Economics and Business Administration (Athens 2008).

² Athens November 2006

Young girls select sectors relating to health and welfare, care, applied arts, such as clothing, graphic design etc. or the field of economy, finance and business administration, contrary to young boys who select sectors that are related to mechanical engineering, electrical engineering, computers and finance and business administration, which comes last.

The report analysis of past research projects³ conducted for the IFAC project stressed the fact that among factors responsible for the low female participation in SET the educational and training inequalities are considered among the most important ones. Although in principle educational systems support equality in reality they support more boys than girls. The role of education, in all levels, concerning the reproduction of social stereotypes and traditional concepts of women's role, which tend to create informal exclusion of girls, leading them in other educational and professional choices than SET, it has been carried into front during the whole IFAC project. At the same time school curricula, the teaching practices, the language teachers usually use, reproduce the stereotypes of roles starting from grammar and leading up to the semantics level, while the system of vocational training also leads to restriction of girls professional horizons.

Despite the efforts of the last years to eliminate gender inequalities in the teaching curricula and teaching material gender differentiations and stereotypes are still reproduced. It has been also noted that media and youth magazines promote values and stereotypes of various social groups thus exercising pressure on *"girls to comply with female stereotypes and rewards them with social acceptance from their parents, schoolmates, and teachers"*⁴.

³ ibid

⁴ ibid

Great influence is also exercised by guidance and career counsellors, when they advise girls on their educational and career choices. Often counsellors and advisors, even if they do it unconsciously, shape their advices on what fits a girl based on societal images of the role of a woman. It is therefore imperative not only to establish a gender sensitive educational environment but also career counselling that will provide accurate information for careers in higher scientific education and the employment opportunities SET offer in high-profile jobs. In order to assist girls to make educational and career choices that will affect their lives they must present and promote successful female role models, who could act as mentors for young women. Counselling should also be directed to parents and school teachers to abort stereotypes.

CHAPTER II

Choosing a career



Choosing a career is a life long process that demands an accurate and in depth perception of ability, potential and achievement. The choice of career is one of the major areas of concern for young people nearing the end of their schooling. Modern career counselling is supporting and teaching students self awareness and decision making, to help them built satisfying lives and help them in the development of necessary attitudes, skills and academic pursuits for career exploration and planning. The influences are complex and the young person's conceptualization of his/her abilities and preferences and the pursuit of a match between these and the job requirements are involved.

As it is mentioned above this in turn is influenced by the young person's gender and place in the family. The young girl is subject to structural influences, stemming from the social and cultural groups to which she belongs. These influences are mediated via social relations that change as maturity approaches although the dominance of the family, as the source of advice, guidance, values and views continue to prevail.

The young person's own gender though is an important factor in career choice. Researchers in the field reported that among adolescents, females mature earlier than boys in their career attitude and that female's reaction to early working experiences was more mature than that of males. They also reported on the impact of gender stereotyping on academic attainment in certain subjects and how popular images in the media influenced career choice. Therefore some sciences are considered as "male domain" (e.g. mathematics, physics and chemistry). Further findings also argue that females' desire is toward intrinsic rather than extrinsic rewards from their employment.

The ages of 16 to 18, are crucial in the lives of young girls, who are dealing with physical and physiological changes related to puberty. They must try for autonomy, while remaining under the influence of their most significant socialisers, parents and teachers and at the same time must make decisions about future plans concerning careers. Young girl's attitude are more likely to have a social centric or connected self schema in which relationships with other people are crucial and are included within self.

Boys on the other hand are more likely to develop an individualistic separate schema with the other distinct from them. These differences are thought to arise from different sources, from boys early experiences of having to differentiate themselves from their mothers, while girls experience similarity and continuance with their mothers.

Therefore when adolescents are considering their future selves, girls and boys, have different cognitions about most probably and most promising selves which may affect their future career aspirations.

Girls on the other hand are clearly aware of the dual responsibility of having a career and maintain a home and a family. Therefore as a research of Postkammer and Smith suggests, women are still choosing careers which are more easily interrupted, less demanding and which require few educational pre requisites.

By adolescence many young girls report a more negative self regard and self confidence in behaviour. Thus the influence of the same sex, parent, mother, is crucial in projecting it to the choices a young daughter should make.

The influence is directly and/or indirectly, using a verbal ambiguity which as a result is questioning the young girl's ability for decision making. A strong form of control is present on a cognitive and behaviour level on behalf of the parents and especially mother,

in this case. Ways of using it and level of interventions is a court with adopted attitude towards their life and choices they make.

Other several factors within the family structure also appear to play a critical role in young girls career development, such as the level of parental education, the socioeconomic status, personality, belief system and the dynamics of family interaction or functioning incorporating parenting style, authoritarian or passive. Findings in some studies and observations have found that mother figures tend to have more influence on the career decision inspirations than fathers.

Classroom experiences are also a factor which differentiates learning approach and achievement expectations. Traditionally females have found advance mathematics achievement elusive. Girls' mathematics achievement is equal to boys but decreases later on. As girls progress through school they loose interest. Historically the advance math is not considered appropriate for girls along with the belief that girls should not reveal their intelligence, since it can compromise their female identity.

Moreover, we see that young girls often are not given adequate information about career possibilities requiring competency in advance mathematics and/ or sciences. Neither are they introduced to women role models with successful math and/or science careers, despite evidence that role models can be an important factor in elevating a young person's aspirations.

At home parents may unconsciously fail to provide support for their daughter's interest in math or science, either by directing their interests elsewhere or by giving all the support for education to their sons. As a result many pupils hold gender stereotypes attitudes towards a range of occupations; interviews with young girls indicate that the main reason that pupils think men or women are better suited for a particu-

lar career is that they associate certain characteristics with a particular gender. For example, women are more caring, better at talking to people etc. Men are stronger. However, some pupils stereotyped the jobs because they perceive more men than women to be doing them. On the whole, women are perceived to have better communication skills, to be more caring, understanding and good at helping people. Men are perceived to be stronger, fitter, more technical and practical.

Research today reveals⁵ that girls receive less attention in the classroom than boys; girls are not pursuing math-related careers in proportion to boys; although the gender gap in math is shrinking, the gender gap in science is increasing. Curricula ignore or stereotype women. Reports also reveal that many standardized tests contain elements of gender bias.

⁵ See also "The AAUW Report: How Schools Shortchange Girls", Wellesley College Center for Research on Women, AAUW 1992

The new model of Career counselling and the School of the future

Modern counselling should be adapted to the present circumstances and trends. It should be more flexible and provide opportunities to explore how the socialization process influence young peoples' career development, learn how to express their feelings, and how to manage and reduce stress and identify strategies for participating more fully in life roles. Moreover greater emphasis should be given in recognition procedures and development of the special skills and capabilities but also of life style. The purpose is to assist young students, through a process of self-exploration to "design their own career path". Thus the student becomes actively engaged in his/her future career path and not a mere passive observer. This also implies that the evaluation method of his/her performance has to be based on different criteria and the success of the method also depends on his/her ability to learn and "transfer" the knowledge to the various professional paths that will appear.

Additionally, modern career counselling should not try to force young women into traditional jobs, where they will be detached from the support of other women; instead they should develop the students understanding of why their choices are so limited.

Moreover modern career counselling should be represent occupations non- stereotypically or even counter-stereotypically, so that a male dominated occupations represented visually by equal numbers of men and women.

Also career counsellors should encourage individual autonomy and it is important to recognise that the test of such autonomy must include the possibility of

choosing conventional as well as non conventional options but choosing them as an act of informed volition rather than as a result of conditioning.

The danger with the progressive and radical approaches is that they tend implicitly to devalue traditionally feminine occupations and roles such as child-rearing and home-making and to impose on women a "male" definition of career achievement. On the other hand, it is arguable that the critical understanding of traditionally feminine roles developed by such approaches, and the awareness of alternatives, are essential if these roles are to be assumed as a matter of genuine choice.

In conclusion, it is important that career counsellors should encourage young people to look critically at sex roles in society which is concerned with awareness-raising and should made positive efforts to encourage pupils to consider taking up subjects or careers that are not normally done by their sex, which suggests directive intervention closer to the point of decision-making.

How to assist parents and educators for Gender Equity

Parents and educators should be helped for assisting youngsters to overcome barriers to achievement, if they include providing role models in traditional and non traditional careers who have successful integrated multiple aspects of their lives, avoid sex role stereotyping, encourage independence and risk taking attitude change towards career choice and open mindedness. *It is also important to make teachers aware of the impact of treating one gender of students differently from the other*⁶. As Gottfredson (1981) stated that gender role conceptions are fundamental to people's sense of personal identity and that this produces strong resistance to relinquishing gender-type perceptions in choosing an occupation. It is expected that such resistance will be strong during adolescence, when young people are still developing their sexual identity and beginning their careers. This seems to pose greater problems for the young boys than for girls in choosing gender-atypical options.

As it is described by Dorothy Blum (1998) there are now new insights into strategies⁷ that foster girls' achievements and healthy development. Innovative approaches such as team learning, all-girl classes and hands-on access to computers benefit girls' ability to succeed in school. Strategies are needed for schools and approaches that enhance school achievement and healthy development for boys as well as girls. As girls reach adolescence, they experience a significant-

6 See Sadker, Sadker & Lewit, *Gender Bias: In the Classroom and Interaction in the Curriculum*, National Education Association, 1995

7 For references and detailed literature see Dorothy J. Blum, Ed. D, *The School Counselor's BOOK OF LISTS*, San Francisco 1998

ly greater drop in self-esteem than boys. Girls are systematically discouraged from a wide range of academic pursuits, particularly math and science. Sex equity is crucial in the classroom and teachers should develop methods to allow females and males to develop themselves without gender limitations.

One method to achieve gender equity is through weekly developmental programs for career and life-planning for young students age 14-16. The aim would be for students to improve self-esteem, look at the roles of women and men in our society, discuss gender stereotypes and explore a variety of a career and lifestyle options. Additionally school personnel should be helped to recognize differences in the curriculum and identify treatment of females that may go unrecognized or unconscious until pointed out. Finally special attention should be paid to boys. Through constructive techniques the issue of gender roles, family dynamics, sexuality and identity formation should be examined along with career planning issues, at all developmental levels.

The role and responsibilities of career counsellors

On the other hand, the responsible professional practice requires counsellors to be eligible about the effects of gender in human development and to apply such knowledge in career counselling with girls and young women.

Career development programs and classes must be shaped and progressed to reduce stereotypes through exposure to a wide variety of work environments, role models in non traditional occupations, mentors, classrooms discussions about occupational stereotypes and gender fair interest assessments.

Counsellors must be open with no preconceived limitations and perceptions on the direction of potential changes or goals in counselling young girls and women. In particular counsellors must ensure that career choice is an open process.

It is important to recognize the significance of gender fair language in all oral and written communication, and avoid using generic adjectives to describe females, to be sensitive to the cultural and all situational factors, which limit the concept of self as well as the inspirations and opportunities available for the young girl.

In order to recognize and be sensitive to the impact of stereotyping prejudice and discrimination and the representation that a young girls produces and last but not least, the counsellor must be aware of and continually review his or her own values and biases and the effects of these on his/her female clients.

The difference in attitudes, interest, attainment, subject choice, parental identification, influence of mothers as a role model and psychological profiles, makes counselling young girls very challenging, recognizing the gender context of this counselling process.

A life's pan-approach to career counselling is crucial. Acknowledging the occupational interest, competencies,

creativity and preferences, may indeed change over time.

Career counselling must also be tailored to the individual needs of a diverse population. A collaborating career counselling effort among counsellors, parents and teachers can help the student develop personal definitions of identity, achievement and career success, after careful self analysis of abilities, life goals and occupational possibilities.

The globalization aspect and life long learning stresses great need for proper guidance, so that young girls especially could have all the necessary information to make and form their decisions.

Early adolescence is a difficult time in the life of students, especially since they are easily influenced by their same-sex peers in an effort of "belonging". Hence it is important for career counsellors to challenge students to become actively engaged in their career development process. According to researchers⁸ "understanding the career development status of middle school students is crucial for developing goals for career development interventions".

It is also stressed that there are indications that the majority of students around 13-14 already start thinking of future jobs. "In fact they tend to associate some school subjects with particular jobs and gravitate heavily towards professions requiring Higher Education diplomas rather than vocational training. This means that it is important to link the educational curriculum with the actual job prospects and issues of the professional world. In order to specify occupational preferences the students need to learn about their options and the learning process should be integrated in the curriculum along

⁸ See A.G Watts, Bill Law, John Kileen, Jennifer M. Kidd and Ruth Hawthorn (1996), Rethinking Careers Education and Guidance. Theory, Policy and Practice Spencer and G.Nilles & Joann Harris Bowsbey (2002), Career Development Interventions in the 21st Century.

with additional assistance from the career counsellor”.

Career counselling programs⁹ should also take into consideration two important factors when assisting students to reach decisions. Firstly during the tender age of 13-14 the young girl or boy is unaware of his/her capabilities and strengths, likes and dislikes. It is still an age where the person develops character and identity. Thus any approach should take this into consideration and proceed cautiously. Additionally due to the limited-or almost always- no experience, a practical approach should be used, bringing the student in contact with the various professions or options and there are plenty of ways of achieving this from career days events to live presentations by professionals.

A way of learning of one’s abilities is through the use of aptitude tests. This is a common enough method used in most junior high school. Aptitude tests can show the student and the counsellor which are the strengths of the student and when combined with personal interests they can prove a useful basis to begin exploring various activities.

“To develop effective interpersonal skills related to the work environment, students can be provided with difficult interpersonal interactions. To increase students’ thinking about the interrelationship of life roles, counsellors can use a group guidance format to help middle/junior high school students examine their current life-role salience by responding to such questions as: how do you spend your time during a typical week? How important are the different roles of life to you? What do you link about participating in each of the life roles? What life roles do members of your family play? What are their expectations of you to accomplish in each of the life roles?”¹⁰

9 ibid

10 ibid

What are the characteristics of an efficient career counsellor?

According to recent literature¹¹ a modern career school counsellor among others must:

- Show accurate and sensitive awareness of student's feelings, aspirations, values, beliefs and perceptions.
- Ensure equity of program access for all students by providing input in school curriculum development.
- Consult with parents and staff on issues and trends relevant to student's welfare.
- Develop close ties with business and industry to increase opportunities for students
- Explore ways technology can extend guidance services, maintaining confidentiality.
- Continually sharpen career development skills and share them with students.
- Conduct discussion groups where parents can ask questions about the school and the counselling and guidance program.
- Conduct parent seminars on concerns about child rearing, discipline and child development.
- Teach guidance lessons cooperatively with a teacher.

In addition to Knowledge and Skills competencies he/she must be ready to proceed to some proactive activities such as

- Organisation of discussion groups with parents and teachers where both could ask questions on counselling and guidance programmes.
- Offer support to teachers through special guidance programmes how to develop teaching methods and strategies for equity such as:
 - ⊙ Use inclusive, parallel or gender-sensitive language,
 - ⊙ Guide students to recognise and eliminate biases and inequalities they observe in school environment,

¹¹ See Dorothy Blum, *ibid*

- ⦿ Treat, boys and girls equally to participate actively in mathematics and science courses,
- ⦿ Help and question male and female students equally,
- ⦿ Design teaching material to explore many perspectives but also relevant to interests and life experiences of both boys and girls,
- ⦿ Encourage and reward female leadership.
- ⦿ Provide opportunities for improving female self confidence.
- ⦿ Presenting issues related to career search for both males and females avoiding differential treatment and
- ⦿ Inform on opportunities for higher education and work by presenting successful role models with a compatible family and career life.

Career counselling of female students

- ✓ Avoid sexist assumptions and stereotypes.
- ✓ Invite experts in gender-equity, women and men role models, including those in non traditional careers, to speak to students.
- ✓ Help female students to locate support systems, role models and mentors.
- ✓ Show visual material (video tapes, films etc) of people involved in non traditional sectors, particularly using mathematics and science.
- ✓ Provide career counselling of female students in groups.
- ✓ Stress the importance of advanced math and science in higher education and career success.
- ✓ Encourage female students to actively participate in advanced math and science courses.
- ✓ Validate female students for their intelligence and talents rather than for their physical appearance.
- ✓ Conduct activities to encourage self-confidence, risk-taking and perseverance.
- ✓ Encourage female students to explore broad career options.
- ✓ Help female students deal with discrimination and sexual harassment.
- ✓ Encourage female students to define their values and goals and then choose career options that are compatible with their values and goals appropriately.
- ✓ Help female students become aware of the increasing necessity for women to be financially independent.
- ✓ Discuss how female students can overcome obstacles in non traditional careers.
- ✓ Provide female students with biographies of persons like themselves for role models in risk taking and career development.
- ✓ Ask female and male students to discuss current

articles about accomplishments of females in different careers.

- ✓ Discuss with female and male students gender limiting stereotypes and effects of messages portrayed in commercials, movies, greeting cards, language, toys, games, and clothing.
- ✓ Help parents become aware of how female students are influenced by stereotypes when considering career options.

As it has been stressed in the IFAC project¹² the way in which role of school professional guidance is designated reflects the philosophy and targeting of this. The main objective of school professional guidance is to support the pupils in the various stages of development courses to take informed decisions according to their specifics, their interests that will allow the pupils to have a very dynamic integration within the social and economic environment. Placing emphasis on secondary education, the main objective of professional guidance is to help investigating various factors in regard to the environment and to the pupils' self and to their own qualifications and skills.

Therefore current trends in education aim at involving in the school professional guidance structures professionals that are more educated and trained on gender issues and how to integrate them in everyday life. In addition to that counselling ethics presuppose commitment of professionals to quality services ensuring equal treatment dropping the barriers, access to opportunities, especially for groups that are socially vulnerable and investigation of young student's personal trends, behaviours and experiences. Moreover gender issues should be brought to the centre of the consultative procedure. Thus, a professional is called upon to investigate tech-

¹² Results of 1st Thematic Workshop, Athens 2006

niques and implement practices that take gender issues into account as a main factor and parameter affecting the educational and professional choices, career plans, the expectations and ambitions for personal and professional developments for both boys and girls and finally, the structuring of the adolescents identity.

The professionals must take into account how the personal experiences of young men and women in the main socialization bodies, the family and the school, established conservative and traditional aspects as to what is male and what is female.

Most analysed projects in the IFAC project's report¹³ found that female roles and ascriptions are contradictory to the masculine image of SET, and this would keep many females from starting a career in SET. IFAC's report quotes career counsellors who observe that many boys and girls have to decide on their future occupation at a very early age (15 to 16) and at this age they would go through fundamental cognitive, social and biological changes and most girls would emphasize feminine behaviour and distance themselves from everything they would perceive as male. This leads to a strong focus on typical female occupations and they would reject typical male professions like SET since these were perceived as contradicting a female identity.

It is also mentioned that the way career counselling at schools is conducted it does not provide all the necessary information regarding education and professions that require specialisation, which could in turn offer better possibilities for professional advancement.

Apart from schools, one of the key actors in providing career information is career counselling agencies. Usually on the management level these institutions seem to be aware of the existing problems. But on the

13 See Doris ARTZMANN and Sara JOHN, *ibid*

level of implementation, where the actual information and advice is provided, there is a lack of understanding and awareness regarding gender inequality on the labour market.

Boys should also be informed on the importance of science and technology for women's career development in order to avoid reproducing surpassed stereotypes regarding female abilities.

In light of the above career advisors must stay updated on gender issues concerning occupational choices and the labour market, so that they would be able to give correct information to the pupils.

As it comes out from IFAC's report gender-sensitive guidelines for career counselling should be developed which should raise awareness of gender-specific patterns and how they could be dissolved. Within the counselling process, special media and methods should be used which could foster girls' interest in a typical occupations¹⁴. There should also be services provided for gender-homogenous groups, so that girls could have the chance to meet women who work in unconventional occupations. And the promotion material for certain occupations should not reproduce common stereotypes.

Many researchers proposed to introduce or support (if already existing) career counselling services for girls only¹⁵. These centres could help girls to discover their abilities without social restrictions. Advising groups of girls and boys together would often have many disadvantages. For example, girls rather miss out within traditional structures because those are usually directed more to boys than to girls. Furthermore, it was observed that,

14 *ibid*

15 *ibid*

within mixed groups, it would be harder for girls to distance themselves from stereotypical ascriptions. Career counselling services targeted at girls could provide more time and space for girls, and these centres would foster a practical approach, since girls are allowed to experience new/atypical fields of occupation hands-on. Workshops, company visits, courses, or meeting role models are activities carried out at those centres. The counsellors would also state that text-based information is often inappropriate for inspiring young people to do new and different things or to go for unconventional occupation or education. But there is an urgent need for these organisations, which provide services for girls for long-term financial support.

However it is useful to point out that the degree of education and awareness programs effectiveness, as regards gender consultation is not necessarily the same for all. The extend to which the concerned experience will be integrated into the daily practice of the centres, depends on a set of factors. Besides the change of attitude and behaviour is a long process.

Finally the usefulness of such recommendations, as described above, will not reach expected results unless they are integrated into the planning and implementation of policies that will enact and strengthen the dissemination, the ideology and the concern for equality between genders in modern school.

As Rosemary Deem¹⁶ said in 1978: "Achieving an education address to men and women that will not limit artificially or wrongfully the thoughts, skills and abilities on the basis of gender differences, is not an easy target within a society. But failure to attempt this because it is difficult is act of cult".

16 Rosemary Deem, *Women and Schooling*, Routledge and K. Paul, 1978

REFERENCES

- ARTZMANN Doris and Sara JOHN (2008), *"Promoting Young Women in SET: Lessons learned- A Cross-National Analysis of Past Research Projects"*, Athens (publication of a final report in the framework of IFAC project).
- A.G Watts, Bill Law, John Kileen, Jennifer M. Kidd and Ruth Hawthorn (1996), *Rethinking Careers Education and Guidance. Theory, Policy and Practice*.
- Bradley, S.(1990), *The Careers Service: Past, Present and Future, British Journal of Guidance and Counselling* 18(2):137-55
- Coopers & Lybrand (1994), *Gateways to Learning National Evaluation: Final Report*, London: Coopers & Lybrand (mimeo)
- Coopers & Lybrand (1995), *National Evaluation of Skill Choice: Final Report* , London: Coopers & Lybrand (mimeo)
- Deem Rosemary (1978), *Women and Schooling*, Routledge and K. Paul, London and Boston,
- Eagle, B.W., *Educational and Career Exploration System* (ECES)
- Gottfredson, Linda (1981), 30, 46-49. *Circumscription and compromise theory*
- McNair, S (1990). Guidance and the Education and Training Market, in Watts, A.G.(ed.) *Guidance and Educational Change*, Cambridge: Careers Research and Advisory Centre/Hosbons.
- Spencer G. Nilles & Joann Harris Bowsbey (2002), *Career Development Interventions in the 21st Century*.

Useful websites

Roadmap for equality between women and men **for the period 2006-2010, and the adoption of the** Pact for Gender Equality
http://136.173.159.21/eplive/expert/shotlist_page/20070913SHL10345/default_el.htm

http://ec.europa.eu/employment_social/gender_equality/index_en.html

http://ec.europa.eu/employment_social/gender_equality/gender_mainstreaming/general_overview_en.html

<http://www.awm-math.org/career.html>

www.epws.org/

www.bls.gov/oco/: Occupational Handbook





INFORMATION FOR A CHOICE:

Empowering young women through learning for technical professions and science career.



SIXTH FRAMEWORK PROGRAMME



Project funded by the European Commission under the Sixth Framework Programme, Science and Society, Women and Science.

www.SET-career.eu

www.IFAC-project.eu