



SAS6 - 036699

IFAC

**“Information for a choice: Empowering Young Women through Learning
for Technical Professions and Science career”**

Instrument: **Coordinated Action**

Thematic Priority: **Science and Society**

Transferability report

Due date of deliverable: **August 2008**

Actual submission date: **August 2008**

Start date of project: **1st October 200** Duration: **24 months**

Organisation name of lead contractor for this deliverable: **KTH**



Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)

Dissemination Level

P	Public	X
P	Restricted to other programme participants (including the	
R	Restricted to a group specified by the consortium (including	
C	Confidential, only for members of the consortium (including	
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1. Introduction

There is an under-representation of women in SET in the European Union today, an issue which affects the whole society. The important question is how to inspire and advise young women to choose a career in SET.

Many attempts, in different countries, have been made but the problem persists. Following this IFAC project "*Information for a choice: Empowering Young Women through Learning for Technical Professions and Science career*" chose to focus its efforts on providing accurate information about SET careers to young women.

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
- EVREMATHIA 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.

The project achieved its aims via the presentation of women from SET professions as Role Models, through the supply of best practices encouraging young women to choose academic and career choices in SET and through research on the role of stereotypes and lack of information affecting choices of young women. Thus the key issue addressed in the project was that of "choice" among young women in their high school years, in the process of selecting a degree and career path.



Among the activities organised in the framework of the IFAC project, a number of workshops and seminars have been implemented. The main aim of these events was to present and analyse the project results i.e. the survey findings but also exchange best practices with the invited participants and extract valuable information for alternative forms related to enticing young women in choosing a technological profession or applying best practices to maintain women in technological and scientific careers.

The seminars and workshops were very informative and offered ideas on how it could be possible to solve the problem of limited participation of young women in SET. As the majority of the European countries face similar problem, the transferability suggestions are valuable to most.

This report will provide recommendations and options on transferring gained experience from selected good practices regarding the promotion of young women to SET. An investigation of suitable best practices has been done within the project. The suggested initiatives or activities have worked well in the countries they originated from. According to report 2.5 it is possible to transfer these initiatives to other countries in Europe, if precautions and necessary steps are taken. However, there are several other points to consider. The points and options for transferability will be discussed in this report.

Workshop papers and seminars are first of all directed to organizations that are responsible for education and vocational training. The material is also meant to be read by people who have an influence on social plans, industrial development and others working on how to get more young women choose a career in SET.

The cases presented during the seminars and workshops of the IFAC project are available through the websites (www.SET-career.eu and www.IFAC-project.eu). The same happens with all related material addressed both to the target group concerned but also to the target audience (decision-makers and politicians, career counsellors, academic institutions).

Before proceeding to transferability options and recommendations it is useful to place some remarks related to the content of the different presentations but also to the different levels of transferability. This will be done in this report.



2. On transferability

Two levels of transferability could be noted. The first one is linked to the local and/or regional level and the second to the European level.

The cases presented during the seminars mainly referred to national and local level actions that took place in the individual countries participating in the IFAC project. This raised some important issues:

1. Whether an initiative would be suitable or not in a region or country different from the one it originated from ;
2. Whether the particular initiative can motivate young women to choose a career in SET and finally
3. Whether an initiative invented and delivered at a university can also work at a secondary school or at another university or institution.

Young women who participate in an initiative or activity want to learn as much as possible and want gain first-hand experience what working in a SET profession actually entails. At the same time they are fully aware that the conditions at the educational visits or demonstrations do not exactly mirror professional conditions. In most cases young girls should find the activities interesting, appealing and educating as to what kind of work in SET they could be involved in. Ideally the initiative should be applicable to different institutional structures, for example from university level to secondary school level with minor adjustments. However often, the restricted or limited use of an initiative at one level makes the initiative inapplicable in other levels.

An initiative found suitable to be transferred means that certain parameters are considered in advance. An initiative that is "copied" might work in a society with similar structure of educational system, "social system" and labour market. However, differences in gender equality status and labour market conditions for women must be taken into consideration. The reason for a low participation of women in SET is very complex and might only to some extent be solved by proposed actions in this coordinated action. It is hard for example to encourage more women in SET in a society where women tend to take care of the household in addition to having a fulltime professional work outside home. When all household work but also children upbringing is left to the wife rather than be shared by both partners, than a career in SET is in practice very difficult and in some cases impossible.



There are of course a number of women who despite inhuman work conditions are working in SET and have made an excellent career. In practice however all the role models with children identified in the IFAC project and portrayed on the database have help with their household. Tax rules, low income for women etc. will make it impossible for some women to employ an assistant at home. Often married women have a husband who is a professional in SET too. It is in these cases next to impossible for the husband to participate in the work at home even if they want to. Even if equal salary for equal work is written in UN's human rights it is not a reality anywhere in the world.

2.1 Assessing transferability options

In order to judge if an initiative or educational activity/programme is transferable or not, there must be an assessment model in place.

First, the characteristics of different kinds of initiatives must be investigated. This is a rather easy task, as this is about fulfilling some criteria on what is a good initiative or activity. One way to setting up the criteria is to use the participant's evaluation. Another one is to form a working group that decides what features a good initiative/activity should have. After the assessment or evaluation of an initiative, more issues have to be taken into consideration

Let us assume that an initiative is considered to be pleasant, interesting, and appealing to young women. The initiative ought to be linked to or contain information about what a career in SET is, information about education in SET, work opportunities, labour market in their own country and in the rest of Europe. Costs on how to deliver such an initiative must be estimated.

However, this is not enough for a successful transfer of an initiative. Even if the pedagogical and work methods are evaluated and found good, more steps have to be taken. It is strongly recommended that there will be a close collaboration between the creator and/or the provider of the original initiative and the authority or organization that will introduce the initiative in their own country. Ideas and work models can of course be transferred as a "paper product or a desk top invention". If the initiative is successful from the beginning, collaboration with someone experienced is needed. If a sponsor, authority or organization should continue to support an activity there is an expectation that everything is working perfectly from the very beginning. Very seldom a second chance is given. Someone working as a project leader can assist on a consultant basis. He or she should be active during all stages from planning details, giving



instructions to students and participate during the first delivery of the initiative. Another possibility is to visit and study an initiative when it is delivered in the first place. The initiator of ideas and the help is often happy to do so. The initiative will thus be disseminated and new users can participate in its development. This way of working can be applied to all kinds of initiatives from initiating "school ambassadors" to laboratory courses.

In short, the most important thing is not what is done and delivered but how engaging and with which spirit and cooperation with the young women, the initiative is delivered.

It is of course important that an initiative is informative and instructional but the real goal is to change young women's attitude to SET and make them consider participating and working in SET. Additionally is important to give the young women relevant information but also keep in mind that too much information might be stressing and the goal to empower women to SET could be lost. A career in SET might look too complicated and too much theory might be more frightening than making the subject more appealing and interesting. Young women often reveal to late in the process (if at all) that they find the theory too complicated and that they cannot follow up with what is explained. In the worst case, the participant will leave with a negative idea of SET and pass on to friends and colleagues an impression of SET as an extremely difficult field, which could potential discourage other women from similar pursues. Therefore, it is crucial to have a gender focus throughout the planning and application of any activities bringing together women and SET.

3. Content of the seminars and workshops presentations

All workshop and seminars presentations made in the IFAC project have been implemented with the aim to provide more/new ideas on how to guide young women toward SET. Another aim of the workshops and seminars was to bring together policy statements, supply written material to decision-makers and to educators wishing to become involved in similar activities. With a focus on the status of female participation in SET and recommended steps to increase the number of women in SET, experts, university professors, project leaders and researchers presented initiatives, policies and projects directly linked to the main issue of the IFAC project. Open discussions were held over the issues encountered, solutions found and opportunities of future exploitation and



potential usage. Problems relating to gender equality were also discussed. There have been guidelines and information directed to parents, relatives and teachers who want to help and give advice to young women concerning a future career in SET while the multimedia laboratory program JOBLAB provided specialised information about vocational and university training/studies.

In brief the presentations fell into the following categories:

1. Projects and programmes directly addressed to young women. Key role in this category played the Role models website and JOBLAB multimedia laboratory, as well as presentations containing training pilot programmes.
2. Information material for decision-makers and representatives of the Educational (HES) and the Governmental Sector (GOV). There are workshop papers that would be suitable for decision/policy-makers and representatives of educational/vocational guidance. These presentations can also be of value for researchers working on gender equality and gender stereotypes matters.
3. Workshop presentations related to the Business and Enterprise Sector (BES), Civil Society Sector (CSO) and Private non-profit Sector (PNP). These presentations contain information on the status of secondary education and vocational training in the different countries, as well as ideas on how to turn work-fields in SET into gender-neutral work-fields. They might be use to stop the shortage of employers and change the reputation of male dominated work-fields.
4. The final workshop contained a separate discussion with some of the Greek Role Models. The IFAC project put a lot of emphasis in that issue because role models can exercise positive powers on young girls. The audience was that offered a different kind of information by listening stories of personal success and drive and sharing experiences about possible careers, how other women pursued it, how they managed to challenge gender barriers that affected or threatened their career development and in general how they succeeded in their studies and career performance.



All the presentations brought also to light some important issues:

1. In almost all European countries there is a trend to undertake innovative actions in order to motivate young schoolgirls towards Science and Technological careers.
2. The most successful ones are those that combine information with hands on experience (such as summer days, summer camps, etc).
3. Universities and in general Higher Education Institutions can play a multilevel role: they can offer their labs for practical experience, motivate their students to serve as role models and contribute to the empowerment of young female teenagers to study in domains that traditionally are classified as male. Academic institutions through their studies and projects can motivate the academic community to produce new means and tools useful to the different stakeholders (teachers, career counsellors etc) in order to better assist young girls in their academic and career choices.
4. The **sustainability** of an initiative or an activity is one of the most important issues. In order to be achieved, funding should be ensured coming from a broad range of sources; state, private, European.

Finally the findings of researches presented showed that the under representation of women in workforce related to SET careers –academia included- is a common issue in all countries regardless geographical areas. The problem still remains even in countries, where initiatives or projects have been implemented. This brought to light how important is the design of policies and strategies that will take into consideration all the aspects of education and improve its quality by involving all actors and stakeholders and by enhancing the mechanisms that will support young children, especially girls receive all the required information in order to make their educational and career choices.



4. Transferability of initiatives and other educational activities

4.1 Information about the chosen initiatives

During the IFAC project different projects and initiatives have been presented. From the collected material, eight (8) successful initiatives, from four countries, have been collected and described in a report of WP 2.5. To enable a discussion on the transferability of different activities, a brief description of these initiatives will follow. More detailed information about the initiatives can be found in the report of WP 2.5 available via the website of the project.

FITwien: Women in Technology (Austria)

FITwien consists of:

- University visits for young women to laboratories and lectures. The visitors take part in experiments performed in laboratories. It is also possible to meet and talk to university students and female staff.
- "Ambassadors", who also work as Role Models, who visits schools and deliver information and answer questions. They take part in "Kick off meetings", coordinate school visits to universities etc.
- "Taster days" where girls and young women can take part in information seminars, special courses like joining giTi (see below), information technology for girls, visits to technology companies, workshops and discussion sessions etc.

giTi (Austria)

The giTi initiative was founded by WIT (Women's Postgraduate College for Internet Technologies, Technical University, Vienna). The initiative works in collaboration with FITwien (see above). The purpose is to motivate and encourage young women to study informatics and/or computer science.



Girlsday (the Netherlands)

"Girlsdays" activities can be found in other countries in Europe and the U.S.A. from where it originated. "Girlsday" is supported by a number of companies in the Netherlands. Companies can join and contribute with different activities on "Girlsday", some of which focus on technology and ICT. "Girlsday" takes place once a year and is directed to 10 - 15 year old girls. There are many initiatives and activities to join on a "Girlsday", with technical solutions and ICT in daily life presented. The purpose of the project is to visualize how interesting and exciting the male-dominated sector can be.

One important project task is to combat professional segregation between man and women and fight gender stereotypes. One goal is to change the view on work in SET.

Summer Schools (Sweden)

The Swedish National Agency for School Improvement has for many years supported summer activities for young women. The authorities have strategically sought to decrease the age for the target group with time. The target group at the moment are primary school girls.

For some sponsored successful courses in science and technology an older target group is accepted. The Summer schools/days intend to bring gender equality, inform about SET and make more young women interested in a career in SET.

Many universities and especially technical universities see summer schools as an opportunity to attract more students in the future as a way of achieving their projections on male/female ration participation-one path also to gender equality in university. This is also a reason why some universities partly fund these activities.

Sensitization of educators and students on gender equality issues and Interventional Programs (Greece)

The main aim of this project is to raise the awareness of teachers, directly, and the pupils and their families, indirectly, on the issues of gender equality in order to:



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- Abolish gender discrimination in the educational and the broader social environment,
 - Integrate the gender dimension in the curriculum of secondary education and initial vocational training. Link the question of gender equality within the procedures of career guidance and the entrance of women in the labor market.

The interventional programs consist of;

- √ Training programmes addressed to active teachers in public schools of the secondary education, general and technical one;
- √ Intervention programmes implemented by the trained teachers in the classes of the school units with the active participation of pupils and students, both boys and girls

The aims of these programmes:

- To promote the philosophy of gender equality in education.
- Introduce broader social environment awareness in education.
- To incorporate the gender dimension into secondary education curriculum.
- To link the issue of equality between genders with the system of vocational orientation.

Technomatheia (i.e. the learning process of technology) (Greece)

The aim is to strengthen the interaction between science, technology and the Greek society. The objectives are to make achievements in science accessible and known by the public and to technical education institutes, primary and secondary education and research institutes. The initiative encourages both men and women to understand and take part in the technical evolution and its implication to society, industry, production methods, economy and everyday life.

Technology around the corner - Techniek om de hoek (the Netherlands)

The purpose of the project was to develop a powerful learning environment taking into consideration learning problems for groups of children and to promote



an orientation in technology. It is also helpful for parents and their children in their choice of future studies and occupation.

The initiative focuses on training in SET, for groups with boys and girls.

The goals of the initiative are:

- Technology is for both boys and girls and not just for boys
- To increase the interest in technology
- Make technology available for children from areas with a weak economy
- Introduce environmental questions to schools
- Develop "after school activities" for children
- Teach children that boys and girls can work together
- Improve communication and language skills to the target group

KomTek - Municipal Entrepreneurship and Technology Centres (Sweden)

The target sector for KomTek is primary and secondary school children. The idea was to establish "after school activities" for children. The children should be able to go to a "centre" and make laboratory experiments, see demonstration in science, listen to talks about science etc. One of the ideas was to get more successful scientists, get more men and women in SET, introduce gender equality discussions etc. The KomTek centres have also become a centre for teachers, parents, innovators, entrepreneurs, local community staff, researchers etc. These technology centres have also been helpful for schools that teach science and technology.

4.2 Questions related to transferability of initiatives

There are a number of questions to be asked and answered, as well as solutions to be foreseen for problems that might be encountered before a successful transfer of an initiative.



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1. Are there any differences in the school curriculum between the countries from where the initiatives come and to the country it is supposed to be transferred?
 2. Will the initiative be implemented to a special enterprise or industry structure? Some initiatives are more or less unique for one country. Will they be suitable for a transfer?
 3. Will the initiative be easy to implement and will it be regarded as an earnest attempt to make young girls choose a career in SET?
 4. Will the original purpose of the initiative be respected or will it be used by local policy-makers? Will the initiatives be used as conceived?
 5. Is the initiative in accordance with policy statements in the receiving country?
 6. Will there be problems that can be referred or linked to gender stereotypes? Will organizations or religious groups make it impossible to accomplish a course?
 7. What are the chances for sustainability and durability of an initiative in a new environment? This question is linked to the possibility for funding of the initiative in future. Even if the initiative is strongly linked to the official policy of a country it does not imply that it will have a safe economic support in future.
 8. For how long will the initiatives be adequate solution for the existing problem? Is the information or intentions already obsolete in some countries?
 9. Is there a pressure from other families with girls of the same age on how suitable an initiative is? Are there expectations of what kind of profession a young girl should choose? Through the parents' ideas and comments,



new thoughts can come up, which can lead to development of a new activity.

The above questions have to be treated with caution and generate reliable answers to ensure an accurate transferring of an initiative from one country to another. The efforts in the implementation are strongly linked to the expected result.

4.3 An attempt to answer some questions above

4.3.1. School systems in Europe

Students of 16 to 18 years old are studying at the upper secondary general schools defined as ISCED 3. This applies to all Europe countries according to Eurydice. As all young women are at the same study level differences in the scholar system do not offer problems in transferring an initiative or an activity from one country to another. The specific curriculum for different countries at upper secondary school level is outside the scope of this report. The degree of discrimination open or hidden is different in different countries. A general plan how to combat that is not easy. The most important is first to visualize problems of this kind, make a policy plan how to get rid of the discrimination, perform actions and have a follow up plan with reports to reveal changes made in the educational system. This issue was made visible in some workshop presentations and seminars.

4.3.1.2. Structures of industries, enterprises and public service in Europe

This question is particularly difficult one and only very general comments can be given. Countries in Europe have public service organizations as hospitals, tax authorities, the police, fire brigades and these authorities all have rather similar structures in Europe. Companies for energy delivery, heating, ventilation, sanitation, maintenance of roads and bridges etc might be operated by private enterprises in some countries and public in others. If a private company is funding a project they might have a vested interest in how the initiative looks like and how it is delivered.

How such a company can exercise influence on an initiative can be visualized with a simple example. Let us assume an electricity energy supplier, from a



country leading the energy field is supporting an initiative. They will in all likelihood ask for a focus on experiments and information about energy and energy delivery. The initiative will be seen relevant in the country from where it originates but for a country based on agricultural products and production of textile and clothing the initiative might be seen as targeted on a product they do not produce. Electricity might be imported from neighbouring countries. In this case the initiative will not be seen as interesting by the young women because of the choice of experiments as it is not linked to an existing industry. A sponsor in a receiving country does not see the point in supporting such initiative.

The service sector is dominant in all capitals or metropolises in Europe and employs an average 80% (65% - 90%) of all employment. Of this, about 30% is public administration and public service. The service sector in capitals is the dominant work supplier and initiatives with service relating activities would be easy to transfer to secondary schools or universities in larger cities in Europe.

For towns with mainly production/manufacturing work-fields no easy rules exist for what is produced and how the production is linked to the size of a city. However, larger and fast-growing cities with car, textile and machinery industries seem to be the most economically powerful and dynamic ones in Europe. These cities will provide many positions in SET in the future. There will be no risk to transfer initiatives to and from these cities in Europe if it is supposed that initiatives will be sponsored from local industries or authorities.

An interesting matter is the choice of work field is, what women in southern Europe prefer compared to women in the Nordic countries. For example, the chemistry sector is very popular for young women in the Nordic countries whilst electricity, IT and computing is very popular for young women in the Mediterranean countries. There are rather few women studying electricity, IT and computing for example in Sweden and rather few women studying chemistry in Spain and Italy. There seem to be no easy explanations for that. One possible answer might be that it is rather easy for women to get well paid work and high positions in the fields they have chosen. These tendencies are worth considering when looking for initiatives to transfer.

Furthermore a new tendency exists where young people's choice of work is often limited in certain countries and they are led to choose jobs based on availability rather than what they would like to do in the future. At the same time the mobility of workers is increasing and young people prefer to move to countries



where an interesting and well-paid work is rather easy to get. The European labour market policy has had an impact on what and where young people get their education and where they go to find a position after their education. There are "countries" that are not happy with the burden of too many expensive students and that the students leave the country after finishing their education. If a country can deliver a popular and good education in engineering and the industry has few positions or low salaries for engineers then it is natural that graduate students move to other countries in Europe after graduation. The shortage of engineers will not be cured or eliminated by transferring successful initiatives if there are few positions for engineers and salaries are low. These circumstances will most likely influence more on young women's choice of career than what kind of initiatives that will be transferred.

4.3.1.3 Problems due to gender stereotypes and pressure groups

Problems due to gender stereotypes refer to the type of the initiative chosen. There might be a risk when an initiative is regarded to be more male rather than female oriented. The selected good practices have been judged with the intention of breaking through gender stereotypes. Even if the policy at a school or university seeks to bring advances towards gender equality, this does not imply that there are no gender stereotypes. Initiatives for young women could be banned from school authorities for not being correct mainly because they are not in line with what is thought to be proper for a young woman. There could also be religious associations, labour unions, political fractions that might have a word when choosing initiatives and these groups may try to stop initiatives from being delivered, pretending to save the young women from unpleasant surprises or save them from being the only woman in a male dominant work field. One way to tackle these problems is to exclusively supply initiatives that fulfil the requirements of gender equality. A possible and smart way is to deliver a well chosen workshop presentation first and then choose a suitable initiative.

4.3.1.4 Sustainability

The only way for an initiative to "survive" is to secure that the first implementation is a total success. In the preparation of the first delivery of an initiative one can never be too careful. It is as important to teach assistants how to work with young women as it is important for the assistants to know the



theory of what they are working on. When the delivery times comes or information need to be given, the content of what is said but also they way its presented is crucial. If a performance is well done the young women will give positive answers at an evaluation and there will be chances for continuing support and funding.

4.3.1.5 Misuse of initiatives

There are head masters and principals of some schools who are fully aware of their inferior education quality in science and technology compared to other schools. The economy is often too poor to employ more skilled personal or to make other changes. Sometimes there is no possibility to find a teacher with the desired qualifications. These leaders alone or together with their staff might see a possibility to raise the standard of education or want to draw attention to their new way to solve educational problems by using "others'" initiatives or transferred initiatives. Their students will appreciate the new pedagogical method. The school has got an educational help free but the purpose of the initiative will be wrong. There is also a possibility that money for gender equality matters will be used for ordinary education for both men and women. This misuse of money could stop the financing of initiatives aimed for young women.

There exist other risks. Some sponsors and authorities work together and finance initiatives, not because of what the initiative will lead to, but to draw attention to their good judgement and modern thinking or simple put, good PR. As long as the purpose is right no damage is done. If the strategy is to get more women working into SET it is good. Unfortunately this is a seldom case. If it is used to display political power in educational matters then the outcome could be questioned as well as if it is used for advertisement of a political system. The evaluated initiatives should be clearly addressed to activities for young women.

4.3.1.6 Pitfalls

A major mistake at the introduction of an initiative will in practice be fatal for a mission to get more women in SET. There will be fewer possibilities for a second chance to repair a damage already done. However good the intentions are a severe loss in credibility can be caused. Problems with funding institutions and/or sponsors will most likely follow. Of course the transferability of an initiative is not



about how an initiative is delivered. Looked from another angle, there is no point in transferring good initiatives if the mission is ruined by mistakes from the very beginning.

Some case studies on what can happen

Physics workshop in Sweden

At a physics- teacher conference in Sweden, some workshops were carried out. The intention was to demonstrate how easy a popular university initiative could be transferred to secondary school education. The leaders or assistants were university students and the pupils came from a nearby secondary school. In order to make the demonstration as realistic as possible the secondary school pupils had not been introduced to the assistant earlier. The same conditions should be present at a real performance in school. The pupils and university students greeted each other and the project started. The demonstration went very well and the audience, secondary school and university teachers regarded the initiative as a good example of a successful experimental session. A closer reflection on what was going on, gave a totally different picture. The intention and the purpose of the demonstration were as good as they could be. The outcome of performance could be questioned. Experiments that were performed were in practise performed by the university students. The pupils revealed no enthusiasm or interest. The outcome of the experiments was mainly to take some measurements and then forward them to the university students. The university students were happy to demonstrate how clever and brilliant they were. The assistants appeared patronizing and the students felt ignorant. During the Q&A session the responses of the university students were technical, failing to elicit understanding from the school students. In the end the secondary school attendees had very little understanding of what they were presented with..

The performance was praised by observing teachers. They thought this was a good example on a new method that could be used in education at secondary school level. On a second thought the demonstration revealed what would happen if the university students are not properly trained. On top of the poor performance there were wrong interpretations of what the experiment should reveal. Even from a theoretical point of view the whole demonstration was not a successful case study. Overall the majority of these secondary school students would leave the experiment with a misconception about what science and technology entail. The secondary school students did not get anything of the



session. The conclusion is that without proper theoretical instructions and pedagogical training even the best intentions will fail. Help from expertise before a delivery is essential. The next example is about what happened at a "Summer School".

Summer school

A new idea was introduced in a course to make young women interested in a career in SET. The new idea was to let the young women meet women in leading positions at their workplace. Meetings with a contact person for the company were held and everything was planned in details. First there should be a welcome session, then an introduction on what the enterprise was doing and a presentation of her work at the company.

The visit took place. After the information part of the meeting there was a visiting tour of the company. Most of the young women made remarks along the lines below;

- How is this visit relative to me? When I will start working, conditions will be totally different!
- The women did not talk much about how it was to have young children at home and work at the same time.
- Did we really come to her work place? Is she working in the company's board room?
- The environment was dull and boring. I do not wish to work at that place.
- It was a waste of time, it would have been better if we had stayed in the laboratories.

The significance of this case study is that the company failed to utilize the initiative not only as a way to attract women in SET but also as an opportunity to "promote" their company and work. The "role models" were not given time to prepare their presentations. The employed women were not used to speak in front of young people. No information of the intentions and plans for the meeting was given to the women who gave the talks. Conclusion; all "links in a chain must be strong" for a mission to succeed. The women at the company should be better informed about the visiting young women. The company should have given more time for preparation of the meeting. An excellent opportunity, to



promote the company and a way of learning new things for the young girls, was lost.

Another **initiative, with good intentions, that also failed** follows below.

Three buses filled with young women came to a technical university. The young women were invited to make experiments at the physics student laboratories. As there were no available students who could help with instructions and practical parts some older lecturers and senior lecturers were asked to help. They found the initiative highly interesting and worth working with. All lecturers were used to supervise university students at the laboratories. None of the lecturers had time for a discussion on what to do. They saw themselves as experts in teaching and did not understand why a meeting was necessary. The young women came to the undergraduate students laboratories and were introduced to the lecturers. After a short introduction about education at a university, experimenting started. When the young women came with basic questions that the lecturers had never heard before they did not know how to answer. When the lecturers were asked to give a helping hand they didn't know what to do. After a while the lecturers began to do most of the experimenting themselves **and the activities turned into demonstrations**. The girls were told they should perform experiments but instead they saw demonstrations, which did not require their participation. An important lesson from this is that even those who think they know how to work together with young women need instructions and special training. Teaching at a technical university and instructing young women are two very different things. A long career as lecturers at a university does not guarantee that they will make an initiative successful.



5. Recommendations concerning transferability

During the IFAC project, innovative actions and initiatives have been presented that could be transferred to other countries. There are many important steps to be taken prior to a transfer of a successful initiative and some recommendations on this issue follow below.

1. It is recommended to focus first on why a transferred initiative should be put into action. The most important reason is to make young women interested in SET and choose a career in SET. Let other aspects, like learning and improved competence, come second.
2. It is important to find collaborators with adequate qualifications. Head masters and principals of some schools in Europe are fully aware of their inferior education quality in science and technology compared to other schools. The economy is often too low and doesn't permit to employ more skilled personnel or to make other changes. Sometimes there is no possibility to find a teacher with the desired qualifications. These leaders alone or together with their staff might see a possibility to raise the standard of education or want to draw attention to their new way to solve educational problems by using "other" initiatives or transferred initiatives. Their students will most likely appreciate the new pedagogical method. The school has got an educational help free but the purpose of the initiative will be wrong. There is also a possibility that financial help aimed at gender equality matters and to get more women in SET will be used for ordinary education for both men and women. This misuse of money could stop the financing of initiatives meant for young women.
3. It is significantly important to involve not only the target group concerned but also as many stakeholders as possible. Parents and family members can play a crucial role in young women's future choices, therefore organise informative sessions for parents. In progressive countries or in progressive parts of a country, research has shown that it is mostly parents who give a helping hand to their daughters. The parents give their daughters encouragement and support them in their choice of a career. In these cases it is similarly important to give information about what possibilities are available for young women to both parents and daughters.



Information to both will be more efficient than offered only to the young woman. Parents and daughters are recommended to visit IFAC websites www.set-career.eu together and discuss a good planning or strategy.

4. Assist family members to help young women to participate in out- of-school learning. In some countries families do not dare to send their daughter to courses outside school or let them travel long distances. It is also considered too dangerous to let young women being outdoors late and this can be dealt with if the school in question can run activities on daytime on weekends and let available rooms be used for carrying out experiments. Family members must help young women in order to participate in educational activities that will assist them in their future academic and career choices.
5. Academic institutions should use assistants and supervisors, who are as close in age with the young women as possible. Young women seldom dare to ask old teachers or lecturers for help and the interaction between the older people and the much younger women resembles too much the ordinary education in school. With young university students young women feel more accommodated to ask about education and what it is like to be a university student. It is easier to create a more relaxed atmosphere with younger assistants.
6. If an initiative undertaken by organisations of educational activities such as summer schools or summer camps, it is strongly recommended to have adequate personnel number. In order to obtain a professional team and ensure their commitment it is also strongly recommended to sign work contracts with all assistants and stand-by personnel, in order to accomplish their tasks successfully. The work should be paid as any other professional work and work conditions should be described in the contract. For professional work (as this is), work certificates can be given to the assistants. They must also be involved in the review processes. The work should be regarded as serious work and be delivered under professional conditions. Most likely there will not be any support from sponsors or fundraiser for a course run under unprofessional conditions. The only way to get sustainability and have economical support is to work professionally. There are, however, some universities and university colleges as well, that expect students to work on voluntary basis. This might affect the sustainability of the projects.



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7. Consult or invite the expert/s who have delivered the course or initiative that is being transferred. Train the leader and the assistants chosen for the activity carefully, before the activities are delivered. The attitude and skill of the leader and the assistants are crucial, if the activity should have a prosperous future. Do not forget to train the assistants in what to do if something goes wrong or if there is an accident.
 8. Find a suitable work place for experiments/activities or seminar rooms that are easily accessible for the target group. Using a room at the ordinary school of the young women could spoil the sense of exclusivity of the activity. When asking for a room at a university use arguments like the activity can be seen as PR for the university and as a long term recruitment activity as well. At the same time recruit university people that can act as “welcoming committee” to the university and also demonstrate the importance of the initiative. As university principals and university boards see an opportunity to get PR for their effort to help or perhaps get more students in the future, rooms are mostly lent for free as long as they are not needed for education or research during the course.
 9. Questions about the legal background for a transfer may be raised. Make sure the initiative to be transferred is not copyrighted or protected from use by other users than it was intended for. There are supporting companies or organizations that want a contribution from potential external users who have not participated in or funded the production of the initiative. Normally initiatives produced by a public entity or funded by the state authorities are free for use within the country from where it comes. An agreement and/or permission with sponsors/fundraisers and the producer of an initiative must be established or requested in order to avoid future implications, especially in cases the initiative becomes a success and large money is involved.
 10. The preparation of a budget for an activity is not simple and should be carried out carefully. There are many factors that will affect how it ought to be done. Sponsors and/or authorities give instructions on how it should look like and what sums are realistic. The way budget is followed as well as how the initiative works will have an influence on the durability and sustainability of the initiative.



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11. It is strongly recommended that there will be a close collaboration between the creator or deliverer of the original initiative and the authority or organization that will introduce the initiative in their own country. Ideas and work models can of course be transferred as a "paper product or a desk top invention". In the long run it might work. In order the initiative to be successful from the beginning, collaboration with experienced people is needed.
 12. Advertise the activity and invite journalists and local newspaper representatives. It is rather simple to attract women to the first time meeting or when an activity is already delivered at another place. Make a plan for how to get participants for the future. Rather soon the most interested young women will have passed the activity or joined the seminars. At a later stage, more detailed and professional advertisements must be used.
 13. Examine safety rules and meeting regulations for seminars or practical activities, like experiments. Prepare a plan what to do if something goes wrong. Make sure insurances are valid and will cover costs for mishaps. Prepare also what to do if someone or a group of people is trying to disturb an activity.
 14. Interview the young women after each seminar or course in order both to get statistics as well as to find out how the activity worked and to get input on how to improve it. Most sponsors want some statistics, if they are going to support more courses or seminars. Use short questionnaires or sit and listen to the young women and write a report later. This feed back should not be regarded as a burden or a tedious work by the young women. One side on one paper is enough both for questions and answers.
 15. Encourage the Use of New technologies to distribute accurate information to the target group concerned. IFAC project largely used New Technologies. Not only developed two websites in order to disseminate the project's results and research deliverables but also made use of a multimedia program addressed to many stakeholders: young girls, parents, teachers, academic institutions, career counsellors. JOBLAB Multimedia Laboratory is for example suitable for transfer to other countries in European Union, of course with some adaptations and always



upon agreement with the producing company. A translation to a native language and research on what vocational and university programs are available must be done and adapted in the laboratory program. Flexibility and possibilities for young women to their own choices differ from country to country. It is therefore advisable to give a hint on how the present labour market is and what it is predicted to be. It would be good to give some information about present salaries, conditions for a maternity leave, flexitime and career steps etc. In that sense JOBLAB is unique since it offers video-clips of women presenting and describing their professions and what their work consist of. The program is useful for all students. It is good for men to see women in advanced positions. Most professions in SET are covered. The program is excellently designed, easy to use, interesting and will hopefully be seen as most relevant for young women. The demo version is interesting and is working well.

16. Finally targeted workshops and seminars on gender equity in education can work as eye-openers and attitude changers for politicians in the educational sector, heads of governmental departments and leaders of universities and secondary schools. The information provided in these events must be related to the conditions in the country from where the presenter comes, in order to give the possibility to the audience to understand if the idea presented can be transferred or not and if adaptations are needed. As the need of more women in SET is universal figures concerning the labour market and the participation of women in SET must be included. It is advisable to add information about work conditions and possibilities to gain a high position in different work fields.

Business and enterprise sectors might be sensitised and also support, finance and help initiatives mentioned in the workshops. Information about the status in secondary education and help with vocational training might be interesting for enterprises, civil sector and private sector. The interest to get more female employers or collaborators in the industry is increasing. In some cases there is a need of a more "personal touch" from enterprises owners in order make more young women interested to work in SET. These sectors have normally rather narrow work fields.



6. Conclusions

The overall purpose of this report was to discuss the issue of the effective **transfer** of practices across institutions and organisations both private and public based on the experiences gained throughout the development of the IFAC project. Successful cases have been extracted from national projects and initiatives that could support the development in embedding successful approaches to young girls' academic and career development.

Transferability is not an easy issue. It entails different factors and components and it is largely determined by **quality**. High valued practices and actions are usually linked with high transferability. However transferability does not alone determine an initiative's or a project's worth. There are many issues that must be considered. Generally transferability presupposes similar environments. IFAC project proved that experience can more easily be transferred between similar environments; organisations or end users (public administrations, government bodies, ministries, decision makers, managers etc). However, not all components of an initiative or a project can be transferred; those that are tailored for specific educational or geographical environments are less transferable than others. In order to accurately transfer an initiative to their own, the new deliverers need to know as many details as possible and have a complete description of the situations under which it has been designed and implemented in order to avoid misperceptions. The ability for the transfer of an initiative is highly depending on the working methods and it is linked with the issues of applicability (how relevant it is), adaptability (to the local circumstances) and complementarity (to existing policies and strategies).

The workshop and seminars presentations of the IFAC project focused on gender equality problems and lack of women in SET in the author's home country. The themes and conclusions drawn from them are not necessarily valid as a whole in other countries. Adjustments to local conditions must be done. The presentations give information about what can be done based on the experiences of the participating countries. They also show that initiatives must be well prepared before they are delivered. A poor performance will convince young girls that a career in SET is not suitable for a young woman. The selected cases also showed that an initiative could be used to give good PR for a school or company instead of making young women interested in a career in SET. One mission must not exclude the other and a combination of the two aims is advised. When it comes to initiatives directly addressed to young girls, attention should be paid to those who want to complement ordinary education with an initiative. In first part the



initiatives should appeal to young women. Convincing work and information about a career in SET is most important for young women and comes first. The educational part, however important, comes second. Make sure that the goals for an initiative are reached.

Why is transferability of initiatives important? Transferability provides resources, knowledge and experience to meet the needs of young girls concerning their future educational and career choices. It can be a powerful tool in assisting all stakeholders in pursuing their own strategies for raising student awareness towards gender issues, educational and career options. It facilitates the development and implementation of integrated approaches for addressing more effectively gender issues, educational needs and priorities. Teachers, career counsellors, researches, can compile good practices, experiences, implemented ideas, projects and initiatives and use them as an ongoing process to Lifelong Learning and Continuing Professional Development.

Finally, as it came out from all the presentations of the workshops and seminars of the IFAC project the educational systems have interesting similarities in regard to gender equity. In most countries a change of the educational system is required in order not only to assist girls in non-stereotypical roles, but also to promote among boys the different concepts and thinking processes in gender equality. Initiatives, educational activities, events that encourage broader collaboration between public and private institutions, companies and NGOs, both on national and transnational levels could create the necessary framework for both sexes to pursue successful education and career paths.



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More information about KomTek can be found on:

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