TWIST

Towards Women In Science & Technology

PROJECT FINAL REPORT

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4.1 Final publishable summary report

TWIST Executive Summary

The TWIST (Towards Women in Science and Technology) project has raised awareness about the role and representation of women and men in science, with a specific focus on women in science, through programmes and activities in science centres and museums. TWIST is financed by the EU 7th Framework Programme and has 11 European partners. It has been coordinated by Experimentarium, Denmark.

The TWIST project has looked at the stereotypes and biases regarding societal roles of male and female scientists and aimed to create dialogue, debates and ignite ongoing discussions on issues of gender and science. To achieve this, progressive programmes and activities have been developed in science centres and museums, such as the TWIST exhibition, Gender Day activities and teacher training. These have targeted visitors, students, their teachers, schools and parents as well as members of the general public. The objective has been to create dialogue, debates and ignite ongoing discussions on issues of gender and science.

This wide variety of activities and programmes has ensured that the gendered nature of stereotypes in terms of scientists is better known by a wider public and in turn helps people to recognise gender stereotypes in society. The European added value has also been the arising of new networks between scientists, media and ministries all with a common goal of raising awareness of the importance of gender diversity and of motivating young people to have a career in science.

Partners of the TWIST project have learned and gained inspiration and found new ways to attract visitors in science institutions and motivate them to participate in science activities. Visitors and stakeholders such as teachers and students have been challenged on their gender biases and gained knowledge that will help them to reflect on their future practice in relation to gender awareness. Perhaps most importantly, we have raised staff awareness on the importance of gender mainstreaming exhibits and activities. This may have a significant strategic importance in bringing a larger and more diverse audience to our museums and science centres and

many of these visitors will also in the future become aware of their gender biases and be able to act on them. These changes, along with the gender-mainstreaming policies implemented in partner institutions, would not have occurred without the TWIST project.

TWIST Summary Description of project context and objectives

The TWIST (Towards Women In Science & Technology) project has raised awareness about the role and representation of women in science through ambitious programmes and activities in science centres and museums. TWIST has 11 European partners and is coordinated by Experimentarium, Denmark.

TWIST focuses on the stereotypes and biases on societal roles of men and women and their career paths. The main objective has been to create and develop innovative activities and exhibitions in science centres and museums targeting students, their teachers and parents to create debates and ignite on-going discussions on issues of gender and science.

TWIST has addressed this challenge with an ambitious programme of co-ordinated activities throughout science centres and museums across Europe to raise awareness about the role and representation of women in Science & Technology in Europe. The programmes have targeted young people and their teachers and parents as well as the general public, with a focus on the outdated stereotypes and prejudices concerning male and female societal roles and career paths.

Activities organized involve the creation of an exhibition in seven European science centres, on-going discussions among citizens, teacher trainings, scientist speed-dating and much more. A new national way of focusing on the gender in science theme in each country called “Gender day” has also been established.

Partners in the TWIST project:

- Experimentarium, Denmark who is the coordinator
- Science Center NEMO, Netherlands
- Fondazione IDIS-Città della Scienza, Italy

- Teknikens Hus, Sweden
- House of Experiments, Slovenia
- Bloomfield Science Museum, Israel
- Trinity College, Ireland in close collaboration with Science Gallery
- King's College London, United Kingdom
- ASDO, Italy, The Assembly of Women for Development and the Struggle against Social Exclusion
- Ecsite, Belgium, The European Network of Science Centres and Museums
- E-tica, Italy in charge of the software for the virtual puppet and database

The first 7 represent science centres and have all hosted the TWIST exhibition and the multitude of activities that have been developed through the framework of the TWIST project.

Objectives and background of the TWIST project:

TWIST has highlighted the importance of gender within science research and celebrated the role of women in science.

Gender equality in science and technology is an issue of increasing significance, insofar as demand for knowledge and technology is growing. Producing knowledge, applying its results and turning scientific views of reality into a shared culture requires an expanding number of science and technology graduates, science communicators and scientific personnel so as to reflect the global nature of scientific endeavour and a broadening interest and engagement of the public at large on scientific and technological research. None of this can be done without the full involvement of women in science. The TWIST project has been developed to face exactly this challenge. Its aim is to raise awareness of the role and representation of women in science and technology throughout science centres and museums in Europe to enhance their capacity to contribute to the need for a gender-inclusive science.

The fields of science, engineering and technology are facing the lack of diversity in gender, as women are significantly under-represented in these areas. A major aim of the TWIST project has therefore been to develop and launch innovative activities,

public activities and exhibitions in the science centre targeting the general public and schools on the role and representation of women in science.

The TWIST project's objectives have been to disseminate these new practices to other science centres and museums throughout Europe and also towards stake-holders in the specific science centres.

Results and outcomes:

The TWIST collaboration has developed and held a wide variety of activities focusing on challenging our gender biases as well as celebrating women and men in science. A good practice manual has been produced describing in more detail these activities. One major activity has been the development of an IAT test – a gender test – that can be taken on the TWIST website, but many partners also have a computer dedicated to this in their science centre. The test shows your unconscious gender biases and the objective is that when you recognise your biases you are able to act on them.

Guidelines on gender equality in communication activities implemented by science centres and museums were one of the main outputs during the first half of the project. The main objective of the guidelines is to provide science centres and museums with a set of recommendations and examples of strategies and tools for activating or enhancing their commitment to gender equality. There has also been produced a version with so-called "Light guidelines". Both of these can be found on the TWIST website.

Another large output is the creation of a TWIST exhibition, which holds a virtual puppet that has been developed for the sole use of the TWIST project. The puppet is manned by an explainer – which the visitor can not see – and it challenges in a direct dialogue the visitors' gender biases and any stereotypical views on gender. The exhibition also holds a database that comprises of 42 female scientist role models – 6 from each science centre country.

Two Gender Days have been held in each science centre country on or up to Wom-

en's International Day.

Last but not least, teacher training courses have been held in the 7 science centre countries targeting at least 200 teachers in each country. The teacher-training manual has been developed called "One size fits all" and disseminated amongst participants at the TWIST-ON event and at Directors' Forum 2012.

Dissemination of the outputs and activities is an important outcome of the project and this has been done nationally and globally. European wise it has mainly been done through the Ecsite network, which enables the TWIST project to reach hundreds of science communication professionals. Furthermore TWIST partners have participated in national and European conferences on gender in science as well as other conferences on science communication where the TWIST project and outcomes have been broadly disseminated. There has been a huge interest for the outcomes when we have participated in conferences and meetings regarding gender and/or science communication.

The project is ending now, but the TWIST exhibition —with a database of 42 female scientist role models as well as a 'virtual puppet' that challenges the visitor's gender biases — will be continuing in each of the science centres that were partners in the project. Furthermore, many of the activities and ideas that have been implemented will continue in various museums and science centres. And finally new networks and collaborations together with female scientists, policy makers and industry have been established due to the TWIST project and these will bring new possibilities in the future.

Science centres and museums have through the TWIST project created examples of gender mainstreaming within science education, innovative activities and scientific systems– examples which may prove invaluable to Europe and to the future of its scientific innovation. TWIST partners have done the TWIST for 3 years now and confronted gender imbalance for the public, schools, parents, universities and policy makers.

TWIST description of the main of the S&T results/foreground

The primary aim of the TWIST project has been to raise public awareness of the role and representation of women in science and technology. TWIST has sought to challenge out-dated stereotypes and prejudices on societal roles for both men and women regarding gender issues and career opportunities. Over the course of the project, the TWIST partners have developed and implemented a number of initiatives designed to address these challenges.

The main focus has been on helping girls to see themselves as the scientists of tomorrow and the methods to reach this goal have been to approach girls at several points of influence in their lives – such as primary school, when choosing secondary education and before choosing higher education. Girls tend to undervalue their own performance, and thereby their ability to pursue careers in science and technology. The reasons are many, complex and varied but a lack of role models and self-efficacy seem to be part of the problem. Methods that can help build self-efficacy and create self-esteem have been employed. There has been a broad collaborative work during the project in several circles of influence relating to girls in their decision point on their future. Key figures like parents, science teachers, school career councillors and their peers have been targeted directly.

How has awareness been raised within young people?

Young people and specifically girls have been targeted on their own terms in order to successfully strive to change stereotype attitudes of scientists. This has been done by meeting them in person in their schools and in the science centres, through direct dialogue and by using role models that they could identify to. Furthermore this has been done in science centres and museums by using science students working as instructors and educators using modern technology and by letting young people and indeed other visitors meet scientists and researchers in person. Female and male science students working as guides in science centres have also become role models for young people.

In raising gender questions within science and technology the TWIST project has sought to build gender awareness in both genders, using the pedagogic methodology of colleague- and peer-learning as one of the methodologies that promotes collaboration instead of competition.

An important way of reaching the objectives of the project has been to build on already established collaborations between the informal and formal learning sectors. This has enabled us to develop new methods and ways of approaching gender issues in schools and to ensure the project's sustainability after the end duration. The project has also worked closely with teachers in order to develop a method of awareness where teachers become catalysts and spark an interest in science and technology in young people.

Programme of Activities

A series of events was developed for the general public and young people who attend science museums and centres to:

(1) challenge their assumptions of what men and women in society are expected to do, with a focus on (Science, Technology, Engineering and Maths) STEM research disciplines and

(2) educate children and young people about the wide ranging roles of men and women researchers within STEM

(3) encourage young people, especially girls to embark on a science career.

Apart from encouraging young people to consider careers in science, technology and engineering, the programme of activities was also about celebrating science and the people who positively contributed to research and development. The activities additionally focused on showcasing women scientists and their knowledge and how this knowledge is contributing to scientific discovery.

The activities also sought to identify potential role models, both women and men, within the fields of science, technology and engineering. People who are trailblazers and role models are uplifting and inspirational; they demonstrate courage and human spirit. However, TWIST uses the word 'role model' to show a number of women with a broad range of characteristics. This gives girls reason to think that they can fit in too. If a profession is open to people of different backgrounds, experiences and personalities, it might be open to a 'you' – the young female visitor to a science museum.

In developing these activities we considered a number of key questions and investigated what was the key message we wanted to disseminate through the TWIST project. Primarily, why do we need to encourage more young women to consider ca-

reers in science, technology and engineering? Asking this question of our peers and partners the general consensus centred on the aspect that creativity and innovation are at the core of science, technology, engineering and mathematics (STEM) and a strong belief that diversity is essential for creativity and innovation. Through diversity, STEM fields benefit from the richness and varied perspectives and expertise which individuals from different genders and cultures bring to problem-solving. Promotion of diversity among people engaging in STEM leads to a greater diversity of ideas.

The activities aimed to raise awareness of the wide ranging roles women play in science, technology, engineering and mathematics, along with the gender biases people bring to STEM disciplines. The activities were designed to appeal to both males and females and to take into account the motivational factors with regard to their interests and participation in science.

Through introducing an interactive programme of events to the public about gender and science, the aim was that each attendee would become aware of the complexities of the issues and what measures and actions an individual, organizations and governments could make to address gender and science.

The overall theme of these activities referenced and played on the female genotype - XX. Below is a list of the TWIST activities that occurred in the different science centres:

1. Implicit Association Tests is a web based tool developed to illustrate the degree of unconscious bias we hold in relation to gender
2. XX Labs celebrates the role of women in STEM through a variety of participative and interactive research experiments and research projects
3. XX Factor/Speed is a series of short talks by creative and passionate scientists who speak for 5 minutes around a key object, person or place that has inspired them & then meet scientists after
4. XX Talk 'in conversation' with senior woman scientists & include videos of women scientists & gender experts
5. XX Business connects female students and technological companies

6. XX Theatre is a theatre work either illustrating women scientists from history (e.g. Marie Curie) or a modern theatre work raising the issues of combing a science career with a family for men and women
7. XX Rate the Statement Invites participants to vote on gender and science related statements
8. XX Discovery is an exhibition which highlights the groundbreaking scientific discoveries by women
9. XX Debate offers a lecture from an expert on gender and science and discussion panel
10. XX Film is a film about gender and science & discussion after

The objective of the activities have been to:

- engage the public on gender issues relating to women in science
- demonstrate the passion behind those who conduct research
- indicate that science is about passion and people
- target the assumptions around stereotype messaging about what scientists and engineers actually do and how this science impacts society
- motivate girls to choose the science and technological subject through hands-on experience
- give girls an opportunity to experience the exciting challenges and possibilities science and technology can offer

These events are described in more detail in the manual with objectives, necessary materials, logistical details and target audiences listed. The events are also documented on the TWIST website.

Good practice Manual for Programme of Activities

A good practice manual on organizing "Women in Science" Programme of Activities covers a range of activities designed, developed and implemented by the TWIST partners. This manual gives an insight into the breadth and variety of events that have been run across consortium partners for the TWIST project.

The handbook is for inspiration and illustrates some successful practices and ideas implemented in science museums and science centres to encourage young people,

especially girls to consider science careers. The handbook also outlines the concepts of designing a 3-day event with specific details from members of the TWIST consortium.

The manual is a modular system and provides a basic framework of instructions and ideas that institutions and centres can combine in ways that best suit their needs in their specific cultural context. The manual is intended as a helpful reference point and includes a checklist of logistical concerns around event organisation, as well as background on how gender issues, and gender awareness can be integrated into the design of an event so that it appeals to both girls and boys.

Gender Day

A national Science Gender Day has been established in coherence with the International Women's Day in each science centre participant country entirely dedicated to science gender issues in society. The gender issues particularly focused on science professions. The objective of the Gender Day is to achieve awareness about stereotypes and outdated perceptions about gender roles and career paths within the field of science and technology.

All 7 science centre partners created and structured a program of activities to coincide with Gender Day in 2011 and 2012. The activities held during the Gender Days spanned from female role models to debates, workshops and science speed dating. Thousands of visitors visited science centres on Gender Day and experienced the science gender activities. Especially high school students were targeted and many participated in the debates and other activities. Students were very active in posing questions to scientists and science communicators and it proved to be a welcomed opportunity for teachers to bring gender and equality issues into the classroom. Male and female students alike participated in the discussions.

The TWIST exhibition

A TWIST exhibition has been created and set up in all the science centre and museum partner institutions. The TWIST exhibition composes of a multimedia exhibition module that is integrated into partners' permanent exhibitions. The exhibition integrates technological aspects with an artistic dimension in order to motivate and inspire the public to interact and engage with the exhibits and thereby stimulate the reflection of visitors on topics of science and gender.

The objectives of the exhibition have been many folded but the main objective has been to make the general public aware of gendered perceptions in science and research and ensure that men and women, boys and girls learn to recognise stereotypes when it comes to gender roles in society. Furthermore the exhibition aims to make young people aware of the variety of career opportunities within science and technology and especially to make young women aware of their career opportunities.

The TWIST exhibition has enriched collections in the science centres and museums with this specific exhibit on gender issues and the aim has also been to encourage the uptake of similar activities after the end of the project and its replication in other science centres outside the consortium. Focus has therefore been on raising awareness of the exhibition and programme of activities at conferences on science education and communication

The exhibition integrates two principal elements:

- A virtual puppet, which is the interface to catch visitors' attention and stimulate dialogue. The puppet is not only virtual, as behind the puppet on the screen there is a real life person (usually an explainer from the science centre) challenging and discussing stereotyped gender attitudes with the public. The puppet has been a facilitator in order to create dialogue with the public and stimulate debate on gender differences in science.
- A European multimedia database of 42 female scientist role models from throughout Europe. Texts, pictures and videos present women scientists in their daily work, illustrating their opinion of the gender perception of science, and how they share the work with their societal roles.

These two main elements are integrated in an exhibition module containing other general information on women and science such as history, gender studies, statistics, etc.

TWIST Teacher Training

One of the aims of TWIST has been to ensure that teachers and student teachers are better equipped to deal with stereotypes and prejudices regarding gender issues and career opportunities. The TWIST professional development programme has aimed to show girls, through their teachers, not only that science is fun, but also that

the STEM (science, technology, engineering and mathematics) field is both a possible and an interesting career option. It has focused on engaging parents, teachers and peers so that they understand their role regarding women in STEM. "Gender awareness in school" was chosen as the topic for the training course.

The gender knowledge will be translated into the classrooms by ensuring that teachers focus on involving students in decision making on content and context of science lessons. This in turn will ensure that girls' and boys' interests and experiences are heard and constantly taken into account. The aim therefore is to create a more gender inclusive atmosphere and to make science education more appealing for both genders.

The core of the teacher training was on creating dialogue and discussions in workshops with teachers and pre-service teachers as to how much stereotypes and outdated traditions influence the perceptions of women in science and focus on what can be done to challenge and change these biases.

Focus has been on primary school teachers and student teachers in science that often don't have much affinity with science and technology. Through special trainings at the different science centres using informal means their gender roles with regard to science and technology has been challenged and teachers have learned methods to motivate boys and girls. This way teachers have also become great role models for the children they teach. The developed database and exhibit was used to change the images that teachers have of the roles of women (and men) in science and technology.

Over 1,000 teachers participated in the programme with very positive and interesting results. They are now in a position to influence more than 25,000 students, to support them in their choices and to address their talents.

Furthermore students must be made aware of and have a clear understanding of the goals and aims for their future science lessons. This will help ensure an open dialogue-based communication between students and teachers. This will also help creating an environment where it is natural to involve students in taking a responsibly for their own learning.

All teachers have the potential to be very good role models. Most, however, are unaware of the influence they have. They subconsciously perpetuate stereotypes in

their teaching, and underestimate the significant role they can play in inspiring their students. TWIST has tried to change that.

The TWIST project has developed and produced a publication called "One Size Fits All – Enhancing Gender Awareness in Teaching". The publication is a source of inspiration for other science centres and museums that would like to offer a programme of professional teacher development on gender awareness in schools. It offers information, guidelines, good practices and tips to inspire others to develop an effective programme. The professional programme described was designed for teachers working with children.

The publication is divided into five parts; the introduction, practical inspiration, gender background, team and classroom activities and further reading. Each tab provides information in brief, illustrated with tips, quotes and good practices derived from the experiences of the collaborating European partners.

TWIST Guidelines

Reaching gender equity in science, technology, engineering and maths is an important challenge for our society. A balanced ratio of men and women in scientific fields and across all decision-making activities ensures greater creativity and effectiveness. Recent policies designed to support gender equity in science recruitment and employments have had some impact. But yet, a gender imbalance still remains. It was therefore a key commitment within the TWIST project to develop guidelines for science centres and museums on how to integrate and address the gender dimension in organizations and how to move towards greater gender equity.

The TWIST project has developed guidelines for science centres and museums based on an ambitious survey. A survey on gender, science and society was conducted through an extensive questionnaire involving 74 European and non-European science centres and museums in order to create a knowledge base for developing activities. The survey provided an overview of the mission, communication strategies and gender commitment in science centres and museums and identified best practices on how to address girls and women.

The survey resulted in a set of Guidelines targeting professionals working in science centres, museums and other science outreach organisations interested in gender

mainstreaming when developing exhibitions and other activities. The guidelines are available for download on the TWIST website: http://www.the-twist-project.eu/en/guide/exhibition/.

10 Key Steps for Science Centres and Museums

The commitment of science centres and museums to issues of gender equity in science is broad and growing. Therefore a shorter version of the guidelines was developed by TWIST as there was a need to have a version that could be easily disseminated and that would provide institutions with important key points they could take into account in their professional development. This version was based on the outcomes of the study and on further research. It was made as a 4-page brochure shaped as the TWIST suitcase and titled "Towards Gender Equity in Science – 10 Key Steps for Science Centres and Museums" and offers inspiration, ideas and best practices on how to integrate and address the gender dimension in organizations. The following quotes the 10 most relevant key points towards greater gender equity in science for science centres and museums:

1. Actively challenge stereotypes – We all harbour unconscious assumptions and prejudices about the roles and capabilities of men and women. You can change perception by raising awareness of unconscious assumptions and by challenging traditional stereotypes in your exhibitions and programmes.
2. Actively target girls, but design for both boys and girls – Have you ever noticed that more boys than girls engage at your exhibits and programmes? The design of your environment may implicitly appeal more to males than females. To attract more girls incorporate the following design features: create opportunities for social interaction and collaboration; connect content to social contexts; ensure an equal representation of men and women in the content.

   But, the real challenge here is one of gender mainstreaming. The most successful initiatives for gender equity are those that stimulate both boys' and girls' interest to the same extent.
3. Address women's invisibility in science: highlight women scientists – Research has shown that women rarely attain senior positions in their fields

even when they have the ability. As a result, there are few role models for young women thinking about starting their careers in science and engineering. To counter this, several successful exhibitions have been developed to highlight the work of women in science.

4. Promote 'mentors' and provide 'role models' – Provide opportunities for visitors to meet and connect with female scientists in order to change perceptions about who can and does work in science. "Science speed-dating" events in which visitors may talk face to face with women scientists about their career plans, private lives and challenges have been shown to be particularly effective for promoting opportunities and challenging misconceptions.
5. Target parents – Research has shown that parents are up to three times more likely to explain the science content of an exhibit to their sons than to their daughters. Support girls engagement by helping parents to facilitate their children's learning whatever their gender.
6. Provide training and resources for teachers – When scientists are asked why the chose their field of study, they often mention and inspiring teacher who was enthusiastic about the subject. Science centres and museums can support teachers gain specialized content and teaching knowledge through unique professional development programmes.
7. Adopt participatory design approaches – Mixed male and female design teams, that also involve target audience groups in prototyping ideas, have been shown to lead to exhibitions and programmes that are less stereotypical and more representative of both genders.
8. Integrate gender perspectives / gender research into evaluation – The figures emerging from the TWIST survey show that science centres and museums still lace specific programme for women and girls despite our growing understanding of gender equity. Formative and summative evaluation studies, which explicitly address issues of gender imbalance, can highlight design deficiencies and help inform solutions.
9. Promote and participate in new partnerships – Develop partnerships at European and local level with organizations working on gender issues. In

collaborating with these organizations and initiatives you benefit from their expertise, while they benefit from your profile, space, and access to audience.

10. Mirror gender equity in your own institution – A gender balance should be promoted not only in your exhibition and programmes but also in the composition of your staff. The survey for the TWIST project suggests that men occupy double the number of managerial positions than women in our institutions.

    Effective gender oriented strategies, which help staff to manage their work-life balance more effectively include: facilitating access to childcare services; fair parental leave policies and flexible working hours for mothers; a constant monitoring of the gender composition of the staff and pay conditions; internal working groups; and the inclusion of gender and equity issues in the institution's Action Plan.

Both versions of the TWIST Guidelines have been disseminated/distributed at several events, including 2 Ecsite annual conferences with almost 1000 participants per conference and the Ecsite Directors Forum 2012, where 100 directors and managers of European science centres and museums participated.

The result of evaluation

TWIST partners have used an array of evaluation tools. The specific tools have been used to examine change in visitor attitudes, but also to assess the practical implementation of activities designed and shared by the partners.

The approach to evaluation throughout the project has been to see evaluation as a tool and a process for planning. Evaluation is often considered to be synonymous with the measurement of outcomes. Whilst evaluation tools can be used to assess the results of a programme, they also offer a mechanism for monitoring process and progress and as such enable reflection amongst practitioners leading, if necessary, to changes and developments in programme structures. Opportunities for reflection engendered by evaluation techniques can also help the programme developers identify unanticipated outcomes, or factors for success not previously recognized.

All TWIST partners participated in a training workshop for exploring types of evaluation tools. These included participant observations, snap-shot interviews with visitors, and reflective 'journaling' – notes made by TWIST partners regarding the nature and structure of observed events which build upon the individual's own professional knowledge and experience as a science centre practitioner. The training session also highlighted the methodology of 'action evaluation' in which evaluation is seen as an on-going and natural component of any programme development (Stroud et al, 2007). As part of the action evaluation approach, partners discussed the need to firstly identify their aims for an event, exhibit, or programme and then to explicitly identify the methods and evaluation tools that could be used to monitor the process and progress towards this aim. As a result, the mechanism for monitoring the activity – i.e. the evaluation – became an integral part of the activity's implementation.

All the TWIST partners acknowledged the value of this approach and incorporated evaluation as a key component of their planning.

Partners shared insights and lessons learnt from their Gender Day events and programme activities on-going throughout the project. Key points were shared by partners and instances of good practice were identified in embedding evaluation and amending programme structures as a result of evaluation findings.

TWIST partners collected a variety of summative data to evaluate the impact of the project. This approach to evaluation – known as Action Evaluation – means that the efforts of TWIST will not be short-lived, but will have instead been embedded into the working practices of each partner ensuring that the TWIST objectives and programmes will be sustained into the future.

In addition to this list of indicators above, the TWIST project added a further indicator: that gender equity initiatives are mainstreamed across institutions. In other words, the design of activities and programmes that promote girls' engagement with science and technology and address inequalities with regards gender becomes standard rather than something special. For the most part, this has been the case for all TWIST partners.

<u>How can science centres and museums meet this challenge?</u>

<u>Gender Workshops for Directors of Science Centres and Museums</u>

The 2011 Directors' Forum hosted a presentation on gender as well as a general presentation of the TWIST project in order to introduce the topic and the complete agenda for 2012 Directors' Forum was gender and diversity.

In 2011 the Directors' Forum was held in Cologne, Germany and Kerkrade, Netherlands on November 24-25 2011. Forty-five directors of science centres and museums from across Europe took part. The topic was "Crossing Borders" and the two-day event focused on reflecting on how "crossing borders" can happen within the field of science centres/museums and with regard to reaching out and learning from other sectors. One entire session of the programme was dedicated to gender issues:

> "WOMEN AS AGENTS OF CHANGE: Gender equality is one of the most contentious issues in modern society, particularly with regard to the share of women in science and research. Science centres and museums play a crucial role in overcoming prejudices on social roles and careers for girls and boys. Activities and exhibitions in science centres/museums, along with their commitment to innovation and engagement, can provide forums for young people and general visitors to consciously and subconsciously overcome gender stereotypes. This inspirational presentation will cross over conventional views into a new way of perceiving gender equity in the science centre / museum context".

Vanessa Campo-Ruiz, Science Officer to the Chief Executive of the European Science Foundation, gave the keynote speech on gender issues entitled "Diversity in Science and Technology as a Tool for Prosperity and Growth", in which she highlighted the TWIST project as an excellent example of raising gender awareness. The 2011 Directors' Forum was therefore a key occasion to introduce the topic of gender to all the participants, set a common ground for reflection and raise the interest for the 2012 Directors' Forum.

The 2012 Directors' Forum was held at Teknikens Hus Lulea, Sweden, partner 4 of the TWIST project, and the theme for the entire two-day event was Gender: Rocking The Balance. Almost 100 directors and managers of science centres and museums participated; notably more than in previous years. The two-day event was organised by Ecsite in conjunction with the TWIST consortium in order to provide the maximum possible impact for the project.

Olle Nordberg, director of Teknikens Hus, welcomed participants to the event. Teknikens Hus included the issue of gender in its mission 25 years ago when it was founded. Now he raises the question: by identifying this imbalance between boys and girls, do we, in fact, contribute to maintaining it? Do girls and women have any less interest in science and technology than men? Perhaps they just express this interest differently. Nordberg emphasized the importance of rocking the gender balance for Teknikens Hus as an institution.

The first keynote speaker, Toni Dancu from the Exploratorium in San Francisco, US, addressed the topic: Considering gender in science museums. Her research indicates that parents talk differently to their daughters about exhibits than they do to their sons. Parents are three times as likely to provide meaningful explanations to their sons. First time visitors were equal girls and boys, but there were 30 000 more boys as returning visitors than girls. This suggested that the museum experience was not encouraging them to come back. Dancu confessed that she did not believe in the gender gap before beginning her research. She believed that the gender gap had already been overcome. But research still shows that this gap is very much present. Her research is grounded in literature, and she looked for female-inclusive design goals: Balanced Representation, Social Context. They tested these goals by making changes to an exhibit and seeing how interaction changed when they made changes to the exhibit. The Exploratorium CEO expressed a strong interest in gender equity, and this effect trickled down the organization. It was always part of the conversation, and it was required. Discussing the literature in team settings also had a great effect. Staff had to discuss gender equity. These conversations were open, deep and honest and helped staff connect personally with the issues.

An in-depth discussion among directors followed the presentation, looking at good practices, other research results, gender-friendly topics and other areas.

For the day's second keynote speech, Marzia Mazzonetto, Projects Coordinator of Ecsite, introduced Caroline Roughneen, the director and founder of WiSER, the Centre for Women in Science and Engineering Research at Trinity College, Dublin, and a partner in the TWIST project. She looked at the gender gap, which appears at higher levels of education. In science and engineering, the gap is present from the beginning and simply gets bigger at higher levels. Why does this matter to research? We

need a robust, sustainable economy during these times of crisis. Research and innovation drive this economy and Europe is competing with new emerging markets. The EU wants to stimulate "smart, sustainable and inclusive growth" as part of the 2020 strategy. The number of researchers across Europe needs to increase by a million. The economic argument is therefore that female human capital has to be deployed more effectively. In science museums, gender has to appear on the agenda both for staff and for visitors. A gender action plan requires leadership commitment, data collection, good practice review and bringing in gender knowledge from experts. The Integer project is working on just this. The European Research Council has a gender action plan. An action plan must include demonstrated leadership at the top. Gender policies have to be equal and effective. Communication has to be fair and open. Good working practices should be promoted. Professional development needs to be considered. Data collection is important. Museums need to rethink exhibits, programmes and audiences.

The subsequent discussion looked at what museums currently do regarding gender, and how to push to ensure the gap is addressed.

Sheena Laursen, TWIST coordinator, presented the TWIST project on the final day, discussing the closing event in Dublin which was a significant success. She mentioned its key findings, such as how the activities were raising the self-esteem of the young people involved. Laursen invited four science centre and museum directors to speak about how they found TWIST activities had changed their institutions.

Eva Jonsson as a Board Member of Ecsite ensured that the gender perspective was reflected in the science centre and museum network. Jonsson said that TWIST had brought gender back onto Teknikens Hus' agenda, and it gave the centre the opportunity to stop, reflect, work internally with the staff and make this agenda sustainable throughout the institution, with a lot of input from the project research.

Anne-Marie Bruyas of Città della Scienza, Naples, highlighted three main learning points. The first was that it was a crucial platform to share experience and ideas from different countries. There is such a variety of gender perspectives according to cultural and social identity and this brought a great richness to the project. The second was the work with women scientists. This was a chance for CdS to really actively involve women scientists and it resulted in a very good relationship with the

network of women researchers at the University of Naples. They came to work as explainers in the science centre and gave their perspective as scientists. The public have to see these positive new role models, and the TWIST database served this purpose. The third main impact was institutional: the Italian Minister of Research visited and saw the TWIST exhibition, as did the EU Commissioner for Industry. This showed policymakers that science centres can be key players on issues like gender in research.

Asger Hoeg, CEO of Experimentarium found that, due to TWIST, it is important to update our methodologies in order to reach boys and girls. Social inclusion has improved in Experimentarium as a result of the project, and gender mainstreaming has become part of the institution's strategy. A corporate branding process is currently underway, and Experimentarium aims to increase its societal role for Denmark, holding a key position. Part of this branding has to include gender balance.

Michiel Buchel, CEO of NEMO talked about the teacher training workshops and guidelines, produced by the NEMO Learning Centre. TWIST brought gender to NEMO's internal agenda. Safety, creativity and sustainability are all issues for NEMO, and gender has now been added to this list. When the NEMO management team was discussing NEMO's future development, gender came to the table thanks to TWIST. NEMO employs a large proportion of women, around 60% of the 200 employees, and this is reflected in the management team but not yet in the board of directors, but the focus on the gender balance of the board is now also an issue. Another result was in terms of the Dutch national science centre network, which distributed the outcomes to all the institutions in the network. Other types of museums have also requested the guidelines. This has been good for NEMO's role in the country. He added that to find good female role models it means looking beyond the usual contacts, and that is one big advantage to the science centre as an institution.

Laursen took the floor again to state that visibility of women in STEM has to be present at all times, in all our activities. TWIST is a project, which has stretched far beyond the funding allocated to it by the European Commission – it has changed science centres and museums for good. These institutions can't just disseminate science – they have to play a societal role. A focus on gender can help science centres and museums reach out to all kinds of organization, and these relationships can be

incredibly fruitful. Laursen emphasized that the most important outcome of the project is the change in mind-sets that she has seen across TWIST.

Why Science Centres and Museums?

In the last years, science centres and museums have played an increasingly active role in communication and promotion of scientific culture and, hence, in the "socialization" of scientific and technological research. In this framework, science centres and museum activities are not limited to the divulgation of the most important advancements of sciences, but also to make known the very process of scientific discovery, including the actors involved in it.

For this reason, the need to give a stronger representation of the role played is felt by women in scientific and technological research. Such a representation is important – among other things – in order to favour the choice of scientific career by young women. This choice is also necessary in order to reach the pool of researchers that, according to the Lisbon Strategy, are necessary for making the European economy able to compete on the international markets.

The TWIST project has addressed issues of equity and social justice, and of fairness and freedom. It has sought to challenge attitudes towards gender on behalf of individuals, institutions and across nation-states more widely. TWIST partners have developed activities and resources that have contributed to challenging gender-based stereotypes around science and technology across a number of countries. More significantly, TWIST has raised awareness at both an institutional level and a national level of the importance of this topic, meaning that the work of TWIST will be continued in the future. In short, the TWIST project may be considered to have laid much of the groundwork for further projects that aim to support greater gender equality in science and technology. Indeed its success should encourage more institutions to implement similar initiatives, and prompt more policy-makers to realize that the museum and science centre sector has much to contribute in this arena.

TWIST potential impact and the main dissemination activities and exploitation of results

TWIST aimed at engaging professionals in science communication (mainly science centres and museum directors, exhibition designers, explainers and educational content developers and managers) as well as visitors in the science centres and museums, teachers, network organizations and policy makers in the elaboration of a European strategy that could be implemented by science centres and museums to address the gender gap within their institutions.

Educating individuals about gendered perceptions in SET and getting these individuals to recognise stereotypes between gender roles in society; and individuals will understand their behaviour; stereotypes and influence relating to gender and science and will learn how to challenge and change their thought process and behaviour. This was described as one of the key impacts in the European programme and in the TWIST proposal. This has had the key focus during the project and served as a foundation for the development of the activities and programmes.

TWIST has ensured that the gendered nature of stereotypes in terms of research scientists is better known by a wider public, and that men and women, boys and girls learn to recognise stereotypes when it comes to gender roles in society A variety of products and programmes have been specifically developed to this effect thanks to the common effort of the consortium during the project. It has been the intention of the project partners that visitors would open their minds and be challenged to consider their attitudes about gender issues related to science and society.

Gender Guidelines

The outcomes of the TWIST project have contributed to the formulation of new guidelines for discussing gender issues within science and encouraging dialogue between teachers, parents, scientists, the public in general and especially the younger generation.

The TWIST project conducted a survey on gender, science and society through an extensive questionnaire involving 74 European and non-European science centres and museums in order to create a knowledge base for developing activities. The survey provided an overview of the mission, communication strategies and gender

commitment in science centres and museums and identified best practices on how to address girls and women.

The survey resulted in a set of Guidelines targeting professionals working in science centres, museums and other science outreach organisations interested in gender mainstreaming when developing exhibitions and other activities. The guidelines are available for download on the TWIST website: http://www.the-twist-project.eu/en/guide/exhibition/.

Based on the outcomes of this study and on further research, project partners Ecsite and King's College London produced a brochure, which represents a shorter version of the guidelines. The brochure presents in a visually appealing way the most relevant 10 key points of gender equity in science for science centres and museums, and it has been disseminated/distributed at several events, including the Ecsite Directors Forum 2012 (where around 50 directors and 30 managers of European science centres and museums participated).

The TWIST exhibition

TWIST partners have developed and implemented the TWIST exhibition in order to go in depth with gender issues. The exhibition aims at stimulating the interest of visitors on gender issues and raising awareness of the wide-ranging roles played by women in science and technology, highlighting the importance of gender issues within science research.

The permanent exhibition interface is the container of two main exhibits:

- a virtual puppet: a graphic interactive interface aimed to have dialogue with visitors and stimulate discussions on gender issues and stereotypes;
- a multimedia database with 42 European portraits of women scientists to arouse the interest of young people to scientific careers and provide counter-stereotypical role models.

The virtual puppet

The interactive puppet in the exhibition has stimulated and challenged thinking and reasoning of visitors about gender stereotypes and roles in an interactive way. The

puppet was to interest individuals who were curious about science and then challenge them about specific issues relating to women in science. We found that the puppet did more than that and discovered that groups of visitors became engaged in discussion with each other and with the puppet on gender issues in science and that long queues would often form in front of the puppet in the different locations of the exhibition.

The European database

The database illustrates diverse types of women scientists from the European partner countries in order to show that many types of people engage in science. The European database of women scientists has challenged the perception that only those actively engaged in science are men. The women scientists involved have acted as role models to female students and influencers to parents and teachers. The male opinion on gender and science is often overlooked and men's experiences need to be shared in order to ensure that the societal expectations of both men and women are addressed, if real change in opinion is to occur. The inclusion of male scientists, parents and teachers discussing their opinion and experiences of gender and science has ensured that the dialogue was inclusive of all actors and that stereotypical male roles in society became highlighted.

The Gender Test

Furthermore many partners have included the IAT gender bias test in the exhibition and provided a computer screen where visitors can test their gender biases. The gender test is also available for all on the TWIST website.

TWIST Activities

Many dialogue activities and programmes (gender days, on-going programmes and teacher training) targeted to different audiences have been implemented in science centres and museums. The TWIST project has involved and inspired many different target groups through these activities and programmes:

- Scientists, both men and women: by valorising the presence of women in science, their research work and their engagement with the public.

- Young women scientists by encouraging their effort to pursue science careers.
- Teachers by challenging their role and how they can better their competences to encourage girls in science, challenge stereotypes in the classroom, assume better models and take into account the gender diversity in science classes.
- Parents by challenging their social and cultural stereotypes and informing them of their influence in their children's career choice and the option of pursuing untypical roots in science and technology.
- Young students, primary and secondary schools, by opening their eyes to unknown fields or fields that have been "narrowed" by social or cultural obstacles leading to stereotyped perceptions.

The materials produced from this project have encouraged uptake of similar activities by key actors in public engagement (media, schools, journalist, museums). The launch of a Gender Day and gender in science programmes in science centres and museums can continue to be a yearly event not only in the TWIST partner countries, but also in the countries that have shown an interest in these new ideas and can see the possibility of such events bringing science together with societal and philosophical issues.

Teacher Training

Parents and teachers, in particular science teachers are seen as positive and negative influencers for students who are considering science careers. The TWIST teacher training has specifically focused on these key influencers to work towards changing the stereotype perceptions that may exist. Research shows that it is important to address gender in science at an early stage (primary school) and recognise that teachers can treat boys and girls differently in the classroom. Teachers have been given time to reflect on their practice through the teacher training developed in the TWIST project and to see themselves as facilitators of change. Furthermore they have come to see parents as potential partners in entering dialogue with the younger generation on gender stereotyped biases. Thereby the teacher training has had an impact on teachers, parents and young students.

The guidelines for teachers "One Size Fits All" has had a broad impact throughout pre-service and in-service teaching education. It has been broadly disseminated to teacher colleges, teachers and schools as well as linked to on each science centre website.

Programme of activities

The 3-day programme of activities has challenged stereotypes at many different levels, from addressing the number of women participating in science and causes of such, to understanding the impact gender has on scientific research. The programme of events has highlighted women's involvement in science, challenging the stereotype that only men engage in science. The intent has been that these activities would affect audience members' awareness and their behaviour towards gender and science. The impact of high-profile female scientists speaking about their science but also about their experiences as a woman in science has influenced both men and women, especially those working in the scientific area. The impact of the programme of events has been to raise awareness and help audience members understand the complexities of gender, science and society.

A good practice manual on organising "Women in Science" programme of activities was developed by TWIST partners on the background of the activities developed over the project. The manual has been distributed at the final TWIST event in Dublin City of Science 2012 and disseminated through the Ecsite organisation to science centres and museums throughout Europe and indeed also internationally. The activities in the manual have also built on a strong foundation of research about women in science and gender issues in general.

Gender Day

The Gender Day implemented in science centres and museums in 2011 and 2012 had a large-scale impact nationally in each science centre country. The impact was particularly with the young generation and their parents. Gender Day gained a broad coverage in the media nationally in each country thereby reaching out to the general public and showing that science centres also take an act on societal issues of gender and gender stereotypes in science and research.

Dissemination

The two main objectives addressed under dissemination have both been aimed at the European community of science centres and museums, museum professionals and science communicators. Notable from the results is that TWIST has received a particularly wide dissemination through the project partner channels, resulting in a successful impact across Europe. The impact of the project was maximized by communicating its activities and outcomes to the more than 400 members of Ecsite (The European Network of Science Centres and Museums) and further beyond and by managing to engage them on the issues central to the project and provide them with action plans nourished from the TWIST project.

Partners have worked intensively on different aspects in order to reach the established objectives. The project not only reached museum directors, educators, exhibition designers and explainers, but through the science centres and museum partners it also reached visitors and teachers across Europe.

Specific actions on gender issues for European directors / CEOs of science centres and museums have been organized which have occurred during and aside of the Ecsite Directors' Forum in 2011 and especially in 2012 where the main focus was gender and diversity. This involved in total around 100 directors / CEOs of European science centres and museums. The TWIST outcomes were presented at these two events and directors of 4 of the TWIST partner institutions spoke about the important impact TWIST had had on their institutions at the Directors' Forum in 2012.

The impact of the consortium and targeted audiences

The TWIST consortium has included seven medium and large science centres in Europe. The impact of science centres in the communication of science to the large public is today well known as they address a wide audience of people with an efficient approach. Respect to other communication tools and the presentation of science and technology with hands-on and minds-on displays has an important impact toward the public in terms of interest, curiosity and emotions. Science centres are considered today as an important support to society at large, as a place where people can find opportunities of informal learning experience in science and technology. Science centres have used these innovative tools in TWIST by promoting activities in their programmes such as through hands-on exhibits, science demonstrations done by explainers as well as scientist, theatre performances in exhibition areas or

in specific auditoriums, displaying of films, participatory games, scientist speed-dating, etc. All these activities have had a main goal to stimulate the interest and curiosity of visitors through emotional, spectacular and unexpected effects. The immediate results are the questioning of visitors and the entrance into inquiry based learning process. Considering the number of visitors and members from science centres and museums involved in the TWIST project and the duration of the activities and programmes among the public, TWIST has certainly had a significant impact for the high number of informal educational practices implemented.

A substantial amount of people have also been reached through outreach projects where project partners have visited institutions such as schools, other museums and teacher training colleges. Some of the TWIST products and activities have been permanently displayed in exhibition areas and able to be visited by visitors at any time, but specific programs have been run regularly in the science centres addressing different typologies of audiences.

Added value

The European added value to TWIST has been combining the national diversities together in a common goal for the valorisation of women in science. Europe presents today a great diversity in terms of social and cultural origins among our member states and due to the integration of immigrants in the past decades. Sharing role models of women scientists and practices in tackling gender issues from different countries in Europe, has offered a unique opportunity to show our public the many facets of Europe, how other countries overcame obstacles related to gender issues but also how to valorise the excellence of our own practices.

The impact on professionals of science centres and museums (educators, concept developers, curators, managers) has been important and thanks to TWIST, many have acquired capacities and competences in order to integrate the gender perspective in their agenda, both exhibitions and programmes. Their experiences have and will be transferred to other sciences centres and museums in Europe.

Finally, the TWIST project has addressed issues of equity and social justice, and of fairness and freedom. It has sought to challenge attitudes towards gender on behalf of individuals, institutions and across nation-states more widely. The TWIST partners have developed activities and resources that have contributed to challenging

gender-based stereotypes around science and technology across a number of countries. More significantly, TWIST has raised awareness at both an institutional level and a national level of the importance of this topic, meaning that the work of TWIST will be continued in the future.
In short, the TWIST project may be considered to have laid much of the groundwork for further projects that aim to support greater gender equality in science and technology. Indeed it can hopefully encourage more institutions to implement similar initiatives, and prompt more policy-makers to realize that the museum and science centre sector has much to contribute in this arena.

Science centres and museums are able to create examples of gender mainstreaming within science education, innovation activities and scientific systems and institutions – examples which could prove invaluable to Europe and to the future of its scientific innovation. The TWIST professional development programme for teachers exemplifies this approach by showing how schools can become more aware of the diversity of their students.

The main objectives of the programme are to initiate and develop debates and to ignite an ongoing awareness of the way we approach the two genders. We know that we do not have “the right answers”, and also had to consider the fact that we are not all experts on gender issues.

It was clear from the outset that we needed to prompt the teachers into talking about their attitudes towards boys and girls. We wanted to avoid a situation in which they looked to us for answers. In the workshop we took time to point out that we would not be explaining how to teach science to boys and girls, but instead challenging participants to explore their own beliefs and stereotypical views on that issue.

Our experience of the programme is that teachers have started to think about the ways they approach girls and boys, and specifically about the “gender boxes” they put children into. The programme has definitely been an eye-opener for participants, with quite a few stating that they have since “thought a lot about their part in

gender stereotyping".

"I now realise that the major differences between boys and girls are found in my perception of them – not in their cognitive skills" – participant in the PD programme at Experimentarium, May 2012.

Address of TWIST public website

www.the-twist-project.eu

4.2 Use and dissemination of foreground

Section A

Dissemination has been a core part of the work packages between TWIST partners and outwards towards institutions throughout Europe. The TWIST website has given partners, policy makers, young people and public in general the possibility to acquire knowledge and gain inspiration from the outcomes, activities and programmes developed in the framework of the TWIST project.

Dissemination has taken place in relevant conferences, nationally and European where the focus often has been on education, learning and science communication. TWIST outcomes have been very relevant in the topics of these conferences.

All partners have worked intensively to develop new networks with universities and other institutions and share the findings and knowledge developed through TWIST.

Disseminating and reaching out towards teachers has also been a key dissemination factor as they are in close contact with the younger generation and as such role models and facilitors for the younger generation's choice in career and challengers of gender stereotypes.

The TWIST exhibition (installed in each of the TWIST 7 science centres and museums) and gender test (accessible through the TWIST website) have also served nationally and European wise as key disseminators.

And finally the guidelines for teacher training "One Size Fits All" and the 2 set of guidelines for science centres and museums on gender in science issues that have been developed through the TWIST project have all important dissemination value in spreading the outcomes of TWIST as well as sharing inspiration and ideas. These also serve as sustaining the impact of the project after the end of the TWIST project.

The Template A1 is not relevant as there has not been scientific peer reviewed publications relating to the foreground of TWIST as it has not been a research project.

The following is a description of the dissemination measures undertaken listed in Template A2.

Template A2: List of all dissemination activities (publications, conferences, workshops, web sites/applications, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters).

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
1	Web sites/Applications	Center for formidling af naturvidenskab og moderne teknologi fond	Creation of the project website (http://www.the-twist-project.eu/en/)	26/02/2010	Internet	Scientific community (higher education, Research) - Policy makers		Europe
2	Workshops	Center for formidling af naturvidenskab og moderne teknologi fond	Partnership with the Danish Ministry for Gender Equality on schoolgirls on a day-internship	20/09/2011	Denmark	Scientific community (higher education, Research) - Industry	300	Denmark
3	Press releases	Center for formidling af naturvidenskab og moderne teknologi fond	Partnership with KVINFO, the Danish Centre for Gender, Equality and Ethnicity. The KVINFO newsletter	10/03/2010	Denmark	Civil society - Policy makers	7000	Denmark
4	Conference	Center for formidling af naturvidenskab og moderne teknologi fond	Experimentarium presented TWIST at the Nordic Network for Women in Physics annual meeting	20/05/2011	Experimentarium	Scientific community (higher education, Research)	200	Denmark, Sweden, Finland, Norway
5	Web sites/Applications	Center for formidling af naturvidenskab og moderne teknologi fond	Experimentarium website presents updated information about TWIST	01/04/2011	Internet	Scientific community (higher education, Research) - Medias		Denmark
6	Flyers	Center for formidling af naturvidenskab og moderne teknologi fond	Gender Day 2011	08/03/2011	Experimentarium	Scientific community (higher education, Research) - Civil society		Denmark
7	Flyers	Center for formidling af naturvidenskab og moderne teknologi fond	Gender Day 2012	26/03/2012	Experimentarium	Scientific community (higher education, Research) - Civil society		Denmark

8	Publication	Association europeenne des expositions scientifiques, techniques et industrielles	7th European Conference on Gender Equality in Higher Education	28/09/2012	Bergen, Norway	Scientific community (higher education, Research) - Policy makers	400	Europe
9	Publication	Center for formidling af naturvidenskab og moderne teknologi fond	ASTC Dimensions	23/11/2011	US science centre and museum journal	Scientific community (higher education, Research) - Civil society		International
10	Conference	Center for formidling af naturvidenskab og moderne teknologi fond	World Science Centre Congress	06/09/2011	Cape Town	Scientific community (higher education, Research) - Civil society - Policy makers - Medias		International
11	Conference	Center for formidling af naturvidenskab og moderne teknologi fond	World Science Centre Congress	06/09/2011	Cape Town	Scientific community (higher education, Research) - Civil society - Policy makers - Medias		International
12	Conference	Stiftelsen teknikens hus	Gender in Science Education	10/04/2012	University of Copenhagen	Scientific community (higher education, Research)		Denmark and Sweden
13	Conference	Association europeenne des expositions scientifiques, techniques et industrielles	Gender Summit	30/11/2011	Bruxelles	Scientific community (higher education, Research) - Policy makers - Medias		Europe
14	Conference	Center for formidling af naturvidenskab og moderne teknologi fond	Gender Summit 2012	29/11/2012	Bruxelles	Scientific community (higher education, Research) - Policy makers		Europe
15	Videos	Center for formidling af naturvidenskab og moderne teknologi fond	Breaking science's gender barrier	08/03/2012	Futuris, Euronews	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias		Europe
16	Conference	King's college london	Ecsite annual conference 2010	28/05/2010	Dortmund, Germany	Scientific community (higher education, Research) - Civil society		Europe
17	Conference	Association europeenne des expositions scientifiques, techniques et indus-	Ecsite Annual Conference, 2011	02/06/2011	Warsaw, Poland	Scientific community (higher education, Research) - Civil		Europe

		trielles				society		
18	Conference	Center for formidling af naturvidenskab og moderne teknologi fond	Ecsite Annual Conference, 2012	01/06/2012	Toulouse, France	Scientific community (higher education, Research) - Civil society		Europe
19	Conference	Association europeenne des expositions scientifiques, techniques et industrielles	Directors' Forum 2011	07/12/2011	Cologne, Germany	Scientific community (higher education, Research) - Policy makers		Europe
20	Conference	Association europeenne des expositions scientifiques, techniques et industrielles	Directors' Forum 2012	22/11/2012	Lulea, Sweden	Scientific community (higher education, Research) - Policy makers		Europe
21	Presentations	Association europeenne des expositions scientifiques, techniques et industrielles	Science and Technology in the feminine event	29/04/2011	Bordeaux, France	Scientific community (higher education, Research) - Policy makers	30	Europe
22	Conference	Association europeenne des expositions scientifiques, techniques et industrielles	Scientix Conference	06/05/2011	European Schoolnet, Brussels	Scientific community (higher education, Research) - Policy makers - Medias	200	Europe
23	Exhibitions	Stichting nationaal centrum voor wetenschap en technologie	Pandemonia Science theatre on Marie Curie and women in science	11/09/2012	Nemo, Amsterdam	Scientific community (higher education, Research) - Civil society	900	Holland
24	Conference	Stichting nationaal centrum voor wetenschap en technologie	VHTO Gender Conference, Amsterdam	05/09/2012	Amsterdam	Scientific community (higher education, Research) - Policy makers	200	Europe
25	Publication	Stichting nationaal centrum voor wetenschap en technologie	Science, It's a girls thing	14/11/2012	Nemo, Amsterdam	Scientific community (higher education, Research)	250	Holland
26	Conference	Fondazione IDIS-Città della Scienza	3 Giorni per la Scuola - education conference	15/10/2012	Citta della Scienza	Scientific community (higher education, Research) - Policy makers	850	Italy
27	Flyers	Ustanova hisa eksperimentov	Leaflets on teacher training	13/03/2012	Hisa Eksperimentov	Scientific community (higher education, Research)	150	Slovenia
28	Press releases	Ustanova hisa eksperimentov	Press release on teacher training	14/02/2012	Slovenia	Scientific community (higher education, Research) - Medias	150	Slovenia

29	Presentations	Stiftelsen teknikens hus	TWIST presentation at teacher networks in technology	14/11/2011	Teknikens Hus, Lulea, Sweden	Scientific community (higher education, Research)	250	Sweden
30	Media briefings	Stiftelsen teknikens hus	Magma regional network for women	08/05/2012	Sweden	Scientific community (higher education, Research) - Civil society - Policy makers	300	Sweden
31	Press releases	Stiftelsen teknikens hus	TWIST news	26/10/2012	Sweden	Scientific community (higher education, Research)	400	Sweden
32	Presentations	Stiftelsen teknikens hus	Swedish network Innovation and Gender	12/06/2012	Lulea, University of Technology	Scientific community (higher education, Research)	400	Sweden
33	Flyers	Stiftelsen teknikens hus	Twistade moligheter	11/09/2012	Teknikens Hus, Lulea, Sweden	Scientific community (higher education, Research)	400	Sweden
34	Conference	Stiftelsen teknikens hus	Conference Tekniken i skolan	25/09/2012	Norrkoping	Scientific community (higher education, Research)	700	Sweden
35	Conference	Bloomfield science museum jerusalem (bsmj)	3rd Israeli Science Communication Conference	16/06/2011	The Israel Academy of Sciences and Humanities	Scientific community (higher education, Research) - Civil society	100	Europe and further afield
36	Publication	Bloomfield science museum jerusalem (bsmj)	Presentation of TWIST to the Museum Education committee	17/04/2012	Bloomfield science centre	Scientific community (higher education, Research)	40	Israel
37	Publication	Bloomfield science museum jerusalem (bsmj)	Unit of Equality between Genders at the Ministry of Education conference	29/11/2011	Ministry of Education, Israel	Scientific community (higher education, Research) - Policy makers	200	Israel
38	Exhibitions	Assemblea delle donne per lo sviluppo e la lotta all'esclusione sociale -asdo	Exhibition on Women and science presented in the framework of the Project "Le vie della scienza"	22/09/2011	University of Rome	Civil society	500	Italy
39	Presentations	Assemblea delle donne per lo sviluppo e la lotta all'esclusione sociale -asdo	Presentation of TWIST	13/03/2012	International House of Women, Rome	Scientific community (higher education, Research) - Civil society	50	Europe and further afield
40	Publication	Assemblea delle donne per lo sviluppo e la lot-	Giornata Nazionale di Lancio dei BANDI	28/09/2011	Rome	Scientific community (higher educa-	150	Europe and further

		ta all'esclusione sociale -asdo	SiS 2012			tion, Research) - Civil society		afield
41	Conference	Assemblea delle donne per lo sviluppo e la lotta all'esclusione sociale -asdo	Final Conference of the Whist Project	07/09/2011	Brussels	Scientific community (higher education, Research) - Policy makers	50	Europe and further afield
42	Conference	Assemblea delle donne per lo sviluppo e la lotta all'esclusione sociale -asdo	Verso l'eguaglianza di genere nelle discipline scientifiche	08/03/2012	Milan	Scientific community (higher education, Research)	150	Italy
43	Conference	Assemblea delle donne per lo sviluppo e la lotta all'esclusione sociale -asdo	Women and Science Annual Conference	04/10/2012	Sienna	Scientific community (higher education, Research) - Civil society	600	Europe and further afield
44	Interviews	Assemblea delle donne per lo sviluppo e la lotta all'esclusione sociale -asdo	Professional Journal of SAIT - Società Astronomica Italiana	15/02/2012	Italy	Scientific community (higher education, Research)	700	Italy
45	Conference	Association europeenne des expositions scientifiques, techniques et industrielles	Places Conference	10/10/2012	Tartu, Estonia	Scientific community (higher education, Research) - Civil society - Policy makers - Medias	200	Europe and further afield
46	Presentations	Association europeenne des expositions scientifiques, techniques et industrielles	TWIST dissemination - L'Oréal-UNESCO Awards for Women in Science	29/03/2012	Paris	Scientific community (higher education, Research) - Industry - Civil society	200	Europe and further afield

4.3 Report on societal implications

The report on societal implications is completed on the Participant Portal of the European Commission.