

How to increase female participation in scientific studies?

Guidelines for Higher Education

*Dear Dean,
Dear Professor,*

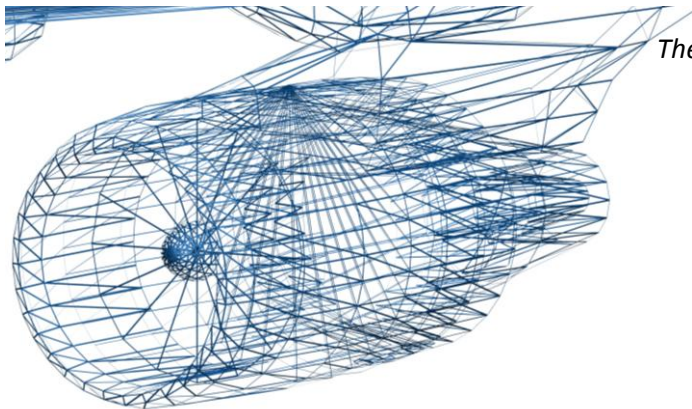
The IN2SAI project intends to increase the participation of female students in higher education studies in scientific fields (especially those relevant for aeronautics) and to contribute to their integration into the Aeronautic Industry.

During these 2 years, different events and activities have been held in Spain, Portugal, Italy, Germany, the Netherlands, and Austria in order to raise the interest of young women in science studies and the aeronautical industry.

At this final stage we intend to strengthen your interest in our project and ask your support in carrying on our activities. For this purpose we kindly ask you to take into account the guidelines we have developed within our project. If you agree, please consider them during your educational activities.

Thank you for your support,

The IN2SAI Consortium



How to make a scientific course more attractive for a female students and how to make her aware of that? That is the crucial issue to be dealt with. During the IN2SAI project, some suggestions and recommendations have been developed to contribute to increasing female students' interest in science studies, such as how to deal with information about courses, organising events or "bridging activities" with secondary schools, and creating activities for the classroom.

1. Increase information & bridging activities!

Since schools are the place for a student's education and development, bridging activities between secondary education and universities are the proper manner to attract female students to scientific courses. Thus, activities like site visits to universities, participation in workshops, and interactive/empirical activities (e.g. flight simulator, wind tunnel, engine manufacturing, etc.) will contribute to expand the limited level of information currently available on certain subjects, topics, and job opportunities.

Female students have to be motivated to embark on a scientific study, but she also needs to know what a course has to offer. Therefore, more advertising on the characteristics of educational programmes and employment opportunities could contribute to increasing their interest in scientific studies.

- ✓ Encourage female students to be self-confident about their potential and create awareness of successful female examples and role models (e.g. ask a student to identify a female role model in a certain subject or area of activity, and then to conduct an interview with her).
- ✓ Raise awareness about the importance of studying science for society, for the economy, for the environment, etc.
- ✓ Conduct self-assessment tests with secondary education students before they enter the university, to assess their own capabilities and to increase their confidence and awareness of their capabilities.



2. Make scientific courses more attractive!

Support information events and incentivize female participation, trying to ensure a minimum percentage of female participation in such events as a performance indicator. Female students, researchers, and teachers are a reference point for future female students; it is important that they are also represented in such events.

Building relations with business/academic associations, student associations, and student networks could provide valuable support in raising awareness, enhancing involvement with the female community, or organising “events addressed to young women”.

Make clearer connections and relations between different courses, with the purpose of creating comprehensive knowledge about the scientific course as a whole and promoting multidisciplinary programmes.

Provide up-to-date information about the connections between scientific subjects and related job opportunities.

Students should be aware of the importance of science to their professional careers which could be at academic level i.e. researchers or at industrial level including entrepreneurship. According to this perspective, mentoring activities between universities, students, and industries have to be fostered.



3. Get a new vision for classes!

Product and systems design, finding new solutions to a particular challenge, and group projects are creative and team building activities that should be fostered. Encourage female students to explore such creative activities as well as to participate in team or group projects. Furthermore, teamwork contributes to enhance a student's capability to share ideas and work together to achieve the same objectives. Gender balance within groups should be promoted.

According to our analysis, female students use more educational material and/or tutorials. Therefore, we suggest introducing self-assessment activities to increase female self-confidence in sciences, and making more use of coaching and positive feedback to encourage them.

There are certain skills considered necessary and valuable to be successfully employed in industry. They include the capability for methodology evaluation and flexibility to adapt them to a specific problem, analytical capability, capability to work in teams, communication and management skills, a proactive attitude, and language skills. These skills should be properly addressed and enhanced in education.



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Guidelines for Secondary Schools

*Dear Dean,
Dear Professor,*

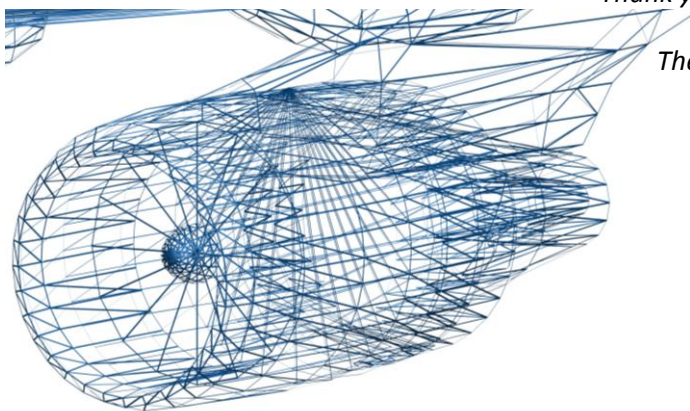
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Secondary schools play a key role in guiding students' choices on their future studies and careers. Therefore, secondary school teachers have the potential to make a significant contribution to increasing female students' interest in science studies. The following strategies could be helpful in achieving this objective.

1. Act like a mentor!

Create awareness, provide information, and enhance learning activities from the very beginning. Increase the students' knowledge about scientific subjects and the relation to job opportunities. Do not highlight gender differences in doing that: both male and female students should be aware that they have the same job opportunities.

Build up young female students' self-confidence, making them aware of their strengths, potential, and capabilities, and that they are capable to successfully undertake any study or attain any job.



2. Support networking activities with universities!

Misconception and stereotypes can lead students in wrong directions and to making wrong choices. More networking and information activities between secondary education students and universities are an effective support action in guiding students towards a better understanding of career paths and opportunities. These activities can be conducted on two different levels: Students/Students and Students/Professors.

Therefore, meetings, information, and training events between secondary school female students and university female students provide opportunities for exchanging experiences and supporting female students in their decision making process. Female secondary school students would be able to clarify doubts and express concerns or obstacles with young university female students who may have had the same doubts and overcome similar obstacles.

Furthermore, networking activities with university teaching staff can contribute to increasing female students' awareness about courses, subjects, programmes, topics, and future job opportunities. These types of activities will raise awareness and reduce misconceptions about science, scientific courses, and job opportunities for female students.

In engineering and science courses, it should be highlighted to future female students that these courses are not only design and/or “boring” calculus, but also include a lot of opportunities to create innovative solutions using key enabling technologies. Job opportunities are not only restricted to product production or maintenance, but for example, also to design, services provision, or research and education.



3. Highlight female successful role models!

There are many women in Europe who are successful in scientific fields and/or the Aerospace Industry. Make female students aware of such role models, and underline that both being successful in science and being a woman is possible.

Encourage the organisation of site visits to companies, creating the opportunity for young female students from secondary schools to meet successful business women and workers, and to share their experiences, supporting students' choices, and clarifying doubts.



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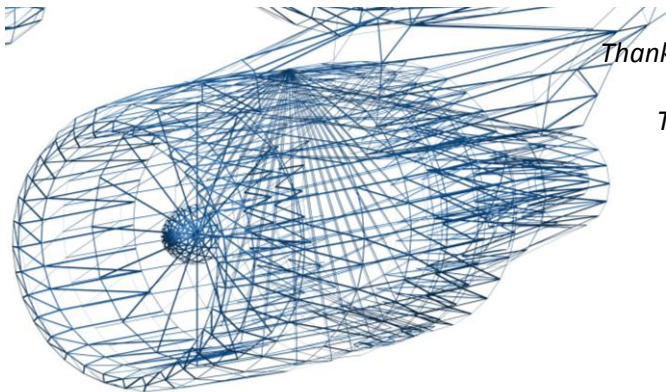
Guidelines for Parents - supporting students' future plans -

*Dear Family,
Dear Expert,*

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The IN2SAI Consortium

The majority of the causes related to low female participation in scientific fields and engineering are related to cultural issues. For this reason it is of great importance to overcome some common stereotypes of jobs and studies “for male” or “for females”.

1. Educate from the beginning!

Changing people’s mind-sets and stereotypes is very difficult. It takes a lot of time, and requires contributions from all social actors to make it possible, from family to teachers and society as a whole.

From early stages of a child’s education, some actions or activities could be facilitating this change. The first one is toy selection. It is a very common perception that dolls or housework tools are female toys, while vehicles or construction toys are for boys.

Toys and games make a strong contribution to a child’s education and development. Enhancing and supporting female creativity from an early stage with a variety of toys and games can lead to an open mind towards the perception of future careers and jobs.

Other activities could be encouraged from an early stage in a child’s education, to support her in discovering her talents, passions, or even vocation.

Overall awareness about science and its importance to society should be promoted, beginning in primary school. Encourage scientific education from early childhood: an enthusiastic approach and passion will surely arise in children!



2. Be informed and open your mind!

Changes in a girl's perceptions are not enough. Family and parents play a key role in a child's choice of future studies. For this reason it is very important for parents to enlarge the perceptions and expectations for their daughter's future. There are many examples proving that women can succeed in scientific fields.

It is important to make both students and parents aware of such successful female figures: they can show young girls that it is possible to study in a scientific field, be successful in their job, be a mom, and be a woman.

Moreover, information about the job opportunities for students graduating in engineering or any scientific field should be made available to students and parents. This information can contribute to spreading a feeling of a successful future for children studying in a scientific field, regardless of their gender.



3. Ensure equal treatment!

Academic and work life should be the same for men and women. They both study and look for a job. There are not gender related subjects or gender related jobs. The false pre-conception that female students are more talented at literary subjects than in maths or sciences, should be ignored. People, regardless of their gender, have certain aptitudes, talents, or enthusiasms towards some subjects or jobs more than others.

Men and women should have the same job opportunities, since they have the same capabilities. Society, universities, and Industries should defend this principle and ensure that they are treated equal and have the same opportunities.

