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HELENA
Higher Education Leading to
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Deliverable D2.2
State of the Art: Career Choice and Gender



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Executive Summary

This deliverable will provide useful background information on career choice and gender in engineering by looking in detail at statistical indicators on gender and career choice in engineering by partner country (section 2) and will provide a review of research on the impact of gender on career choice and research that explores the reasons women choose to study engineering (section 3). A large amount of interesting data has been generated by partner countries, and although these are too detailed to include in the main report, we have included these in the appendices should further information be required.

Statistical Indicators on engineering Students

In most countries women now make up over half of the higher education student population, but make up a much smaller proportion in engineering and technology, ranging from 18% of students in the UK, to 35% in Serbia. In summary we can see from the analysis that:

- Gender differentiation by discipline remains despite women's access to higher education
- Women as a percentage of engineering students have steadily increased participation over the last four decades - latest figures from partner countries demonstrate that women's participation rates in engineering higher education vary from 18-35%
- Women drop out rates are lower than average in engineering education and success rates are higher
- Feminine disciplines in engineering – architecture, chemical engineering
- Women are consistently under-represented in mechanical engineering and electrical and electronic engineering
- Taking into consideration women's increase in access to higher education we can see that women's *interest* in taking up engineering at university has not increased over the last four decades. The percentage of women students in higher education who choose engineering ranges from 15% in Serbia to 2% in the UK.

Statistical Indicators on Professional engineers

- Data on women professionals by discipline in engineering reflect trends identified in the student statistics – for example, that women are participating more as architects, than as professionals in other types of engineering.
- The proportion of women counted as an engineering professional is lower than the proportion of women in engineering education for all partner countries.

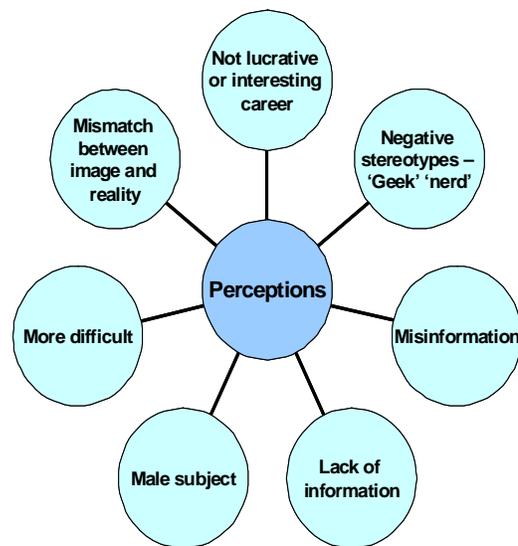


Review of literature on gender and career choice in engineering

The choice of what subject to study is still deeply gendered, as demonstrated by the statistical indicators on students in higher education. The decision to study engineering is influenced by interests and ability, knowledge of the subject and 'contact' with engineering. STEM subjects at school level are crucial in terms of access to engineering higher education, in terms of a child's ability, success, confidence and self-efficacy. Key factors that impact on the decision to study engineering are as follows;

- Direct contact with engineering – via family members
- Background and socialization – middle-upper class, supportive parents
- Personality – Self image and gender identity, motivations, 'act of rebellion'

It has also been found in research that perceptions about engineering can have an impact on whether a young adult will decide to study engineering once they have achieved success at school level. The diagram below illustrates the main findings with regards to perceptions about engineering.



Once the decision to study engineering has been made a series of factors can influence the subsequent decision to pursue a career in engineering. In particular, research has explored the academic culture dominant in engineering departments and higher education institutions finding that the masculinity of cultures reflects those found in industry, there is sometimes denial about any problem with regards to women's interaction with these masculine cultures, but there is also curriculum development and the desire to innovate engineering curriculum along the lines of interdisciplinary content and innovative delivery methods. Some research that has looked at the role of industrial placements and professional engineering identity in the decision to pursue a career in engineering and how women, in particular, experience these elements has found that industrial placements form an important socialization tool in terms of professional identity and women learn in these contexts to manage and perform their gender and adopt 'coping strategies'.



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