

article:2300**I Still Wanna be an Engineer! Women, Education and the Engineering Profession**

1. **Context/background.** Gender inequity in engineering enrollments at university continues despite the frequent claim of the unmet demand for more trained professionals. Previous studies have suggested that women lack the necessary cognitive and practical skills as evidenced by their lack of academic achievement in maths and science. In the past decade significant numbers of young women leave school with high achievement in these areas and yet do not take up enrolment in engineering.
2. **Research questions.**
 - What is the connection between school achievement and enrolment in engineering at university?
 - How can a mixed methods study lead to a better understanding of the ongoing gender imbalance in the engineering profession?
 - How might engineering education provide a more appropriate learning experience for successful entry into the profession?
3. **Theoretical background.** Professional identity, emerging as a key feature of the problem, is approached through three theoretical frames: Bourdieu's concept (2000) of habitus in terms of the connection between social context and individual agency. Identity is here conceived as constructed by the ongoing interactions between individual and environment and thus a fluid, changing concept (Shotter & Gergen, 1989). Wenger's notion (1998) of workplaces as comprising "communities of practice" and sites in which identities are formed.
4. **Methodology: mixed methods.** Stage 1. Qualitative interview based study of a widespread range of professional engineers, 41 women and 10 men. Stage 2. Survey of 357 engineering workers across 3 large engineering firms, followed by targeted interviews with 44 women and 52 men and focus groups at each site (7.5.7 N=19). Survey data analysed using SPSS; interview data organised using NVIVO.
5. **Findings and analysis**
 - Achievement in maths and science emerged as an important feature of the educational background among the women interviewed, less so for the men. Women also reported being encouraged by teachers and family members to enter the profession.
 - Marked differences in age and gender profiles across the 3 companies with women as a group being significantly younger and with less institutional experience than the men as a group. Young women are seen – and at times resented – as being a feature of the changes in the profession as it seeks to become more competitive in a global economy. Women's lower position within the institution contributes to their individual experience of having to struggle for professional recognition.
 - Gender equity should be seen as a systemic rather than an individual issue. While some of the men's comments revealed unreconstructed gender

stereotypical views it is the profession itself, its culture, its processes as well as its gendered composition that many women are unprepared for and find difficult.

6. Educational implications

- Maths science education is very important for girls in the choice of engineering. The women engineers had found their school experience in these subjects both pleasurable and formative in their self understanding of their capacities and talents. Related to this is the value of teacher support in choosing a non-traditional career such as engineering, especially in the case of young women who do not have any family connections with the profession.
- In terms of professional education there is a need for an educational experience that includes more than skilling for the job in order to fit people for the workplace environment. None of the engineers interviewed had any doubts about the adequacy of their initial degree in terms of preparing them with the necessary skills for the technical work. However many engineers, and most particularly the women, did look for more understanding of the politics of the workplace and the development of strategies in order to position themselves more effectively and comfortably as colleagues. The women's experience of working life could have been improved had the pre-service courses engaged with some socially aware study whereby students were introduced to the history and traditions of engineering and the need for change contingent upon the present climate of globalisation and the knowledge economy.

References

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