7. Women and Technology

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Technological branch suits women extremely well

The proportion of women in the technical industry and especially in its management positions is still modest. Suggested reasons for this are for example the differences between men and women and the networks of men. Conventional views about gender roles still have an impact on career choices. This is also visible in the proportion of women and men at technical universities regarding students as well as staff. Success in the technical field does not depend on gender, this has been proven by many a competent woman in the industry.

Are there differences between the women and men working in the technical industry? The subject has been studied a lot. One fine example from the field of information technology is a research paper by Marja Vehviläinen (1999)[1]. It deals with the activities of a women's IT group in the residential area of Marjala in Joensuu. As students, the women's group was mainly interested in how things were done, while a corresponding male group went straight into the techniques of things. Even the behavior of the group's PC advisor varied according to the group, he addressed women and men differently.

It has been claimed that boys and men learn information technology deep into their fingers and even dreams, and that they will then be able to mould knowledge from there. As for women, information technology is said to remain as something like a foreign language that they know well.

However, if we look at people with similar educations, it is obvious that the situation is changing. Hannakaisa Isomäki (1999)[2] has studied the conceptions of both male and female IT professionals about the users of the systems. The interviewees described the users from the following viewpoints: business economy, IT or work processes. This kind of approach is a subject-object setting, typical of professionals in this field,

where one relates to another person in a predefined role. According to this example research, education seems to mould people across genders.

Management and empathy

Characteristics of female managers have been studied extensively. However, these studies give a somewhat contradictory view. For example, motherliness is an asset for successful women in politics, while female leaders in the banking business do not show motherliness. Not everything in motherliness is positive of course, like excessive fussing. The ability to take others into consideration and the ability to listen and to deal with conflicts is the right kind of motherliness for career women.

Research shows that female managers consider empathy one of their strengths. Men add conscientiousness and perseverance to women's strength list as well. Women think that the small number of female managers is due to a reluctance to apply for management level posts, another reason being their responsibilities at home, which they feel slow down their career path. Also, men's networks are a certain kind of barrier to women's advancement. Male executives do not perceive home and men's networks as a barrier to women's careers, but emphasize the impact of traditions and women's reluctance in general.

Out of the traditional occupational roles

How does all this correlate with technical universities and the world of science? Suddenly it is hard to find any differences between men and women in technical universities on any levels. Why is it that there are so few women there if everything is OK?

Research explains this in many ways. Schoolbooks, for instance, still mirror the traditional occupational roles. Liisa Husu (1999)[3] claims that even if discrimination has been rare in the science communities of the 1990s, hidden discrimination still exists in the workdays of many female scientists. Husu says that when we talk about hidden discrimination, the situations can always be said to have a rational reason. We do not pay attention to things like this in the middle of a normal workday.

In 2005, 20% of the students at TUT were women. They form a large student group and they will probably adapt themselves very well. To fa-

cilitate their professional identity, there are a lot of good examples of successful women graduate engineers. At TUT, 26 % of the postgraduate students, 7 % of the professors and 17% of all teachers are women. Most of the female professors have been appointed during the last few years, so there are no long traditions yet. If we look at statistics, increasing the number of women professors seems to be a challenge for TUT. It is, however, hard to appoint a woman as professor since there are so few of them among the applicants. So what needs to be done is to make girls and women more interested in technology.

"The hard chicks" of technology

So what is a female professor's weekday like? At the outset of any new job there is a readjustment period. A woman in technology may have to face unfamiliar situations even more than men. It is not usual e.g. for a young woman to work as a boss for notably older men. Even if the situation is new and calls for readjustments, it does not mean that it is an equality issue, although this may cross the minds of both parties. It is mostly a question of adapting to a new work culture.

It is essential for women to be able to function as women even in technical and male-dominated work communities. Differences can be seen as enrichment.

Women in technology do not have enough models to know how other women act, which causes insecurity and the extra effort we often see. You should be better than the others and even more than that because you are only a woman. It is said that a woman must do more than a the others to gain credibility, but it is hard to say for sure if it is the woman herself, or people around her that demand this. In general, people tend to want better results, and this demand comes only partly from the environment. It is important for the women in technology that they themselves and their colleagues believe in them despite the old conceptions.

It happens every now and then that a woman's relation to her own womanhood is contradictory. Female engineers may call each other 'one of the guys'. In situations like this, it seems almost as if they wanted to prove how efficient they are even though they are just women.

It would be great if women engineers could call each other by feminine names without creating an image of an unskilful engineer or researcher. Positive expressions, like the established term "the father of the idea", often refer to the male gender. Nevertheless, a good idea might actually have a mother, if it was originated in the head of a female visionary. Correspondingly, a qualified female engineer could be considered 'one of the girls'.

Men say that a woman in a meeting soothes the situation and cleans the language of the meeting. It is also harder to put pressure on a woman than on a man in tough situations. Anyway, there will always be tough women who, as sole representatives of women in negotiation situations with men, take charge of things and put everything in order.

It may occur to a woman that she might not be able to bear certain things because she is a woman. However, time after time we realize that no one else is a 'super person' either. To experience life with feelings, positive and negative, is part of the richness of being a human being. What women do may often appear to men as very feminine, but a woman finds it hard to recognize this, as there are so many kinds of women in the world.

Women have great chances to succeed in the field of technology. The minor differences between women and men or between individuals in general are a richness that is worth fostering - equally and in cooperation. ■

References:

[1]Vehviläinen, Marja. 1999. Naisten tietotekniikkaryhmä: yhteisöllisestä ja paikallisesta kansalaisuudesta. In book: Tietoyhteiskunta seisakkeella: teknologia, strategiat ja paikalliset tulkinnat. Eds. Eriksson ja Vehviläinen. Jyväskylä: Jyväskylän yliopistopaino. pp. 187-202

[2]Isomäki, Hannakaisa. 1999. Ontot tarinat: tietojärjestelmäammattilaisten ihmiskäsityksiä. In book: Tietoyhteiskunta seisakkeella: teknologia, strategiat ja paikalliset tulkinnat. Toim. Eriksson ja Vehviläinen. Jyväskylä: Jyväskylän yliopistopaino. pp. 99-111

[3]Husu, Liisa. "Nainen on tiedemaailman paaria" Helsingin Sanomat 7.6.1999.

Interview
Ulla Vehmasaho / Professor Leena Korpinen, M.D., D.Tech.

We need inspiring role models to make girls more interested in technical science.

″ A woman should be able to succeed in working life as a woman″

Are the sexual differences in working life real? Why aren't there more women in technology and what would we need them for?   Will neuter gender be the solution?

Leena Korpinen works as professor at the Laboratory of Electrical Engineering and Health, Tampere University of Technology. As a researcher, she has personal experience and opinions about women's position in a male and technically minded community as well as in daily life, about leadership and women as technological innovators and users of technology.

There has been lively discussion about women and their risk taking ability, their leadership abilities and the power they have in working life. Talking about power, professor Leena Korpinen wants us to pay attention to where the power in an organization is, and where the decisions are made.

 - Power is often in structures that cannot be seen or heard. Those who are the most active make decisions in the background, not necessarily in meetings. If you really want to contribute to something, remember that life is a complicated game. Speak directly to the people who make the decisions. Whether you take the floor in a meeting or not, does not matter. Meetings are not necessarily the most significant places for making your voice heard.

Women's risk-taking ability has received a lot of criticism. As a doctor,

Korpinen knows that the biological difference between men and women, i.e. hormones is one of the factors that have an impact on our risk-taking skills.

- Women do not have the same kind of zest for competition. When the amount of testosterone in a car race was measured, its amount rose drastically in men while the change in women was of minor importance. In working life and politics this expresses itself in that women step aside more easily if they know there is a major problem approaching. This can also be a sign of conscientiousness, of course, i.e. women want to resign when they feel they are not good or skillful enough.

Mothers and fathers as role models for a leader

What about leadership abilities? Does a woman have to become 'one of the guys' to succeed in working life?

- Unfortunately some women adopt the 'one of the guys' - attitude, in their speaking style and dressstyle, because they think they cannot manage without them in this world of men, Korpinen sighs.

> " Whether the manager is a woman or a man is not essential. The essential question is whether s/he really is interested in technology and knows what s/he is doing."

- It is the personality that matters, but also the policies of different branches. Womanhood is probably more lost in technical sciences than anywhere else. The premise seems to be that of 'a girl having chosen the occupation of boys'. This situation could be helped if there were more role models for girls and if they were able to see with their own eyes that an engineer really is allowed to look feminine.

According to Korpinen there is another cultural problem, i.e. different expectations for women and men as leaders.

- The older the superior is the more people regard them as a mother or a father.

Consequently, people expect more motherliness and empathy from a female leader. If a female leader denounces an employee or gives him/her

a warning, she will be criticized and considered hard and cruel - instead of the empathetic mother she was supposed to be. A man, or a father, has always been considered an authority so hard-edged behavior can be expected from him. Thus, he will not be criticized. What is perhaps significant here, is that a woman's behavior will be criticized anyway, do what she will.

Does the technological industry need women?

Various projects aim at increasing the number of women in technical sciences, either as students or as employees. The proportion of women among the students in technical sciences has settled at about 20 per cent. There is vivid discussion on whether technology would change significantly if there were more women working in the technical industry. Does the technical industry need women?

This is not unambiguous, Korpinen says.

- We have to be honest here. What the technology industry needs first of all is skilful employees. The fact that women are being employed as employees and not as women is a good thing as well. As they are in their jobs, their assets will get noticed and next time this company might even hire a woman just because she is a woman. This is how a cultural change takes place, even though it is a slow process, Korpinen argues.

- I think the most efficient work community is one that includes both men and women. Women can contribute something new to the design of technical devices, software and services, but this is not basically a gender issue.

Neuter gender – a solution?

The woman of the 1930s home appliance advertisements was a credible housewife as she was beautiful, well-groomed and thin due to her electric appliances. Why isn't a young, beautiful, stylish, and thin woman a credible leader? Should we get rid of genders altogether?

The mere thought of this is appalling to Korpinen.

A woman must be able to succeed anywhere in the working life as a woman. There are no such communities that allow a woman to be both a woman and a man. The idea about a neuter community is based on a

AEG
Santo-Jäähdytyskaapit

*toimivat täysin auto-
maattisesti, varmasti ja
äänettömästi*

Virrankulutus häviävän pieni

*If women are passive and led by emo-
tions, why did they want to mecha-
nize their homes, and why did the
advertisements of the home appliances
appeal to reason?
(Photo: Electricity Museum Elektra)*

robot-like image of man.

The role of technology as a central force in the information society will be emphasized in the future. It is essential to make it part of everyone's all-round education. Women, too, should partici-pate in technological development and help to create a properly functioning daily life and a humane future for us all.

- Whether the actor is a woman or a man, is not essential. What is essential, however, is that the person who designs, carries out research, or manages the technology industry is truly interested in what s/he does, Korpinen sums up.

Shopping with a man

Our daily life shows the differences as well. Women and men are still treated differently for instance when they are shopping for technical appliances.

- I had to go to another store when I was trying to buy a digital camera, be-cause I wasn't getting decent service. I thought maybe I have to take a male en-gineering student to go shopping with me, but then I found a shop where I was treated as a customer, Korpinen says laughing.

This is a familiar situation to many women. In 2004, the Consumer Electronics Association had research done on women as buyers of techni-cal devices. According to this research, 80 % of these women believed that technical applications improve their life. 89% of women participate in decisions about when to buy technical devices, even if the salesmen for electronics serve mostly male customers. Three quarters of the women

said that they are ignored in electronics shops or that they are treated in a discreditable or even offensive way. 40 % of the women said they get better service if they go shopping with a man. What is more, only 1 % of the women in the research group thought the manufacturers of the devices pay any attention to women when designing the product.

Sense and sensibility of technology

The male-female differences as users of technological applications have their roots at the time when technology was in its infancy. The same atmosphere of doubt can still be sensed to be present when we talk about women and technology.

The relationship between women and technology was born in the 1920s when the automobile arrived to the roads of Finland. A car was considered a very masculine device and people were very suspicious of women ever driving a car – the attitudes being almost negative. The explanation for this was that women were considered unable to learn to drive the car because they were physically so weak, their intelligence is low, they were unstable, and suffered from women's diseases like nervous diseases and hysteria.

In the 1930s housework activities started to gain more room in people's lives. This was supported by technology, meaning to facilitate housework and thus leave more time for hobbies. It was the woman's moral duty to mechanize the home.

"The most decisive factor in keeping the girls away from technical education is the confrontation between learning languages and mathematics."

The common claim that women are the more passive gender and mostly directed by their emotions, and that men are active and rational was not true at all at the time.

The electric home appliances turned out to be useful: the vacuum cleaner, the washing machine, the refrigerator. These appliances were to help women's work at home. The users were women. Advertising was also directed at women and it appealed mainly to one's reason.

Even now new products are mostly marketed based on the benefits

that purchasing the product can bring a woman. This is probably because technical appliances targeted at women are still made for the purpose of facilitating housework. Men, however, see technology as an opportunity to play and experiment. The technology of men is pleasure-seeking: fast cars and boats, home theatres, and game consoles. This makes men and women different as users of technology. Women are driven by reason and potential benefits while men are driven by a wish to experiment, have fun, and play.

Are we able to draw some conclusions from this when discussing women as leaders or the ones with power in the world of technology?

Also the broad based education needs the strong 'core'

Although technology is not a gender issue, women surely have a lot to contribute to our increasingly technical everyday life. It is still worth fostering girls' interest in technical sciences. What are the greatest obstacles in this work then? Is it the social pressure or the views of teachers and parents? Or do we still answer this question by saying that technical sciences do not interest girls?

The most efficient work community consists of both men and women.

Korpinen has an answer right away:

- Our greatest obstacle is the confrontation that is still alive: languages versus mathematical subjects. The whole school system is based on this line of thought, so it is worth while to change!

If the Ministry of Education first changes this setting, surely all others will follow.

Educational variety could be one solution. Girls could be offered interdisciplinary educational choices, i.e. technology made just for women.

Broad-based education, however, has its pros and cons, Korpinen says.

- As for university level technical education, studying the theory of mathematics thoroughly is also essential for women, as there is no doubt it will be needed later. Having a strong theoretical background will help you succeed in the discussions of the working life, Korpinen stresses.

- Usually the problem with a broad based education is that the 'core' is not strong enough. It makes it easy to move away from the actual technical work, to human resources or sales and the technical know-how is forgotten. Secondly, these fashionable education lines might even educate women for jobs that in reality do not exist. This harms the graduate herself, since she will not get a job, and harms business life as well. We need competent people in the technology industry.

The equality projects that were started thirty years ago did not have major impact. Reports show that even minor changes may bring substantial growth, but so far the good things have not become established practices.

Korpinen does not think the projects are to blame, rather the way they are implemented.

- The projects have nice goals but they lack a decent plan of action that would help them achieve the goals and maintain the results. Thus, the goals remain just great ideas which will not be carried out in practice.

The practicality law applies to the world of technology as well. If the understanding in one's head is not in one's hands, it will be useless. ■