

Women in Technology

In the previous issue, the author wrote about technology, education and the new workforce. In Part II of the article, she writes about the role of women in this technological age.

by Jennie S Hwang

FOR THE last three decades, I have been immersed in and contributed to the fast-moving, technology-based industry. With an innocent mind, right after the completion of a virtually non-stop education from kindergarten to doctorate, I found myself to be a part of dynamic evolution of women in the workforce. Bit by bit through the real-life excursion, I came to grips with the role of women in the male-dominant workplace. I realised and appreciated the commonality and differentiation between men and women in the workplace. Most of all, I discovered the intricate balance of competence, capability, intellect, and femininity.

What I have done in the last three decades was to work hard, and made tangible contributions to the corporations that I have been associated with. I founded two entrepreneurial businesses, made respectable impact on the industry, wrote several technical books, trained many scientists, engineers and technologists around the world, and in the meantime, raised two wonderful children. It has been truly a learning, nurturing, and fulfilling experience.

With respect to women in technology and in the workforce, excerpts from my keynote addresses to the American Society of Women Engineers (1999) and to the Annual Conference of American Association of University Women (1997) offer a glimpse into this topic.

Role of Women

Women are powerful human resources. In this decade, women will make almost two-thirds of new entrants to the United States workforce. As new entrants, women bring fresh ideas, new and different perspectives. Women facilitate the bridging between the workforce, market-



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place, and society. In this new economy and information era, the ability to engage women and leverage their talents is essential to the success of a business and to the prosperity of the society.

It is generally understood that a woman's level of education is a key predictor of her satisfaction with life and her ability to manage multiple roles. Women's great concern for the next generation is whether education is preparing them well enough for the future.

Over the last two decades, women have made impressive inroads in almost all professions from politics to academia to corporate board to factory.

However, disparity in profession, wage, and status between men and women still exists. For example, women make up more than half of the US population, but female engineers constitute less than 20 per cent of the US workforce.

Paradox

The extent of progress made by women differs with the field and the country. American women have fared well compared with the rest of the world in most professional fields. Take politics as an illustration.

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women have made impressive inroads in politics; the number of women mayors has risen more than ten-fold; women have quadrupled their ranks among state legislators; the number of women on Capitol Hill has nearly doubled. It is a sterling record.

A *Business Week* report on Japan (19 April 1999) states: "Companies must rely more on women to keep factories humming . . . Women still suffer because most were hired and trained as clerical workers . . . The revised labour law in Japan is an important step forward. Because of the ban on sexual discrimination, companies can no longer advertise positions for men or women . . ."

"Japanese women are beginning to hold on to their jobs longer and thus improve their chances of moving up the ladder."

A question has often been asked: Is there a gender gap? This leads to the question: Are there any real inherent differences between men and women that contribute to the disparity in men's and women's profession? What have been the influences of family, school, and society?

A recent study provided very intriguing information, and it is scientifically convincing as well: When a baby comes



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into the world, his/her brain is a jumble of neurons, all waiting to be woven into intricate and complex circuitry of the mind. This is analogous to the computer: trillions of neurons are like the Pentium chips in a computer before the factory preloads the software; they are pure and of almost infinite potential.

Genes may constitute the brain's main circuitry but environment makes up trillions of fine connections.

However, a recent brain research seems to suggest: "His brain is different from hers". It is reported that, on average, males outscore females on tests of spatial reasoning. Females outscore males on linguistic ability.

For some light entertaining value, the story continues: Male rats have superior spatial ability, allowing them to roam around and find multiple mates during breeding season and presumably find their way back home afterwards. Female rats, on the other hand, tend to hang around home base and wait for males to show up. The males, unfortunately, are often late because when they do happen to get lost, they refuse to stop and ask for directions.

It was found that there are different views between men and women. For instance, when asked to name the main issues facing USA, women feel social problems such as education and poverty are more important, whereas men consider deficit reduction and government spending more critical.

Overall, what have been the barriers to women's advancement? Women and men also seem holding different views in answering this question. Women feel that male stereotyping and exclusion from informal networks are the two major hurdles. On the other hand, many men believe that women's lack of significant line management experience is the primary reason that women do not make up a higher percentage of decision-making positions.

Work and Family

Another important issue close to the heart of women is work and family. As a mother of two children and one who has dedicated to one's profession way beyond a "nine-to-five" job for the last 23 years, I will speak on this with personal experience and from the bottom of my heart.

I vividly remember how hard it was to leave home going on business trips when

my children were young. Every time I was on a trip, my daughter always "drew" a note and stuck it in my briefcase. I saved these notes over the years and would like to share some of them:

Dear Mom, I hope you have a nice four days in California. I'm really going to miss you. I hope you have a very safe trip. I really love you and I hope you have a good presentation and have a lot of people there.

P.S. Thank you for trying to get me the porcelain doll!

Dear Mom, I hope you have nice time in Singapore. I'm going to miss you for a whole week. I love you very much. I hope you have a good meeting. And also a safe trip there and back. Try to call us every day. Will you get me something(s)? Bye.

Love, Lindi.

Dear Mom, I hope you have nice days in Ireland. I wish you didn't have to go. I will miss you. I love you.

P.S. I don't want you to die on the plane. At this moment, I'm crying.

Love Lindi.

Today, Lindi is a sophomore at Wellesley College. In contrast, my son Raymond, however, never wrote any notes for my trips. Could this suggest some inherent difference between boys and girls?

Raymond just graduated from MIT and will enter Harvard Medical School in the fall. During his first year away from home and in college, he sent me a Happy Mother's Day card. The front of the card was designed with prints:

"It's Ultra Woman! Super-charged nurturing force! Kitchen commando! Friend, fortune teller, fashion coordinator! Brilliant psychologist! Daring adventuress of the late 20th century!"

What a great card designer! Inside the card, my son wrote:

Dear Mom, this card seems to be made for you. Of course it lacks the business side which you have distinguished yourself in, but then, that only applies to one mother in the world. I am doing well in school, and living well. I miss you and home very much. I look very much forward towards returning home.

*Happy Mother's Day,
Love Ray.*

Nothing can be more rewarding to a mother than a child's love and appreciation.

To have both family and a career and to do well in both is the most demanding task that takes extraordinary effort and planning. Is it feasible to manage both work and family? I would like to say yes.

Success lies in a few diligent considerations: We have to use our full strength; we need to use our time to its ultimate efficiency; we must work with our partners, spouse, and family members to coordinate and to cooperate; think positively, with a can-do attitude. Equally important, we should hold pragmatic views and expectations toward our professors, employers, society, and the country.

Opportunity

Scientists and engineers constantly face new challenges and opportunities as well. Unparalleled rewards come with the challenges. Collectively, we can make the world a better place; individually, we have the opportunity to make our mark. Women in science and technology are aspired with higher self-esteem, motivations, encouragement and pride.

It is estimated that 60 per cent of new jobs in the next two decades will require technology skills. The shortened product cycle of "high tech" products, from nine to 12 months to three to six months manifests the rapid technology evolution. In this information age, life-long ability to acquire new knowledge becomes a must.

The science and engineering training not only provides the base for technology skills but also paves the solid ground for the ability of continued learning. With continued learning, we will meet the demands in the technologically challenging new millennium. No time in history was nearly as exciting and glorious as the present.

As women, we shall fire up our energy and ambition and use our determination to make our dreams come true. 

Dr Jennie S Hwang, is an international business woman, lecturer and consultant. Her writings include over 120 publications and several high-tech books related to leading electronic material and manufacturing technologies as well as social and business issues.