

WOMEN AS CIVIL ENGINEER-CHALLENGES AND SCOPE

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Abstract

The era of globalization and rapid technological development has changed people's lives dramatically. Science and technology play an extremely important role in the contemporary society. Government in developed and developing countries recognize the importance of the development of S&T sphere. The roles of men and women have changed dramatically in the contemporary society. Science and technology are decisively important tools that can be used for the advancement of women in most. Women's involvement in the application of science and technology will lead to beneficial and productive uses. The science and technology in the four critical areas will affect all of the critical areas: education and training; economy (and economy linked with poverty); health; and communications/media. The four critical areas noted above and believe that science and technology in these areas will affect all the critical areas. For example, improved education and training in science and technology fields and applications will pave the way for women's involvement in leadership positions, which, in turn, would increase women's incomes and empower women in their communities. Access to improved communications would affect women's access to each other and promote their ability to organize politically There has been considerable effort in the last decade to increase the participation of women in engineering through various policies. India has achieved higher technological advancement during last decade of civil engineering, which is equally enthralling, encouraging, as well as, demanding for women in the field. Women account for nearly 51% of the construction labour force. Even though, the percentage of unskilled women is high in construction site, the female-to-male ratio in a class of civil engineering is hardly one-fourth. Nearly 20% of women continue to work in the field of civil engineering, while others move on to pursue different fields. This paper looks into different aspects of civil engineering, which is equally enthralling, encouraging, as well as, demanding for women in the field.

KEYWORDS: *Globalization, Science and technology, Women, economic contribution, civil engineering*

INTRODUCTION

The era of globalization and rapid technological development has changed people's lives dramatically. Science and technology play an extremely important role in the contemporary society. Government in developed and developing countries recognize the importance of the development of S&T sphere. The roles of men and women have changed dramatically in the contemporary society. Women have got more freedom to express themselves and take active part in the development of technologies, despite the fact that there are still problems in this sphere. As stated in the report by the United Nations (2011) called Applying a Gender Lens to Science, Technology and Innovation, : "There is also need for recognition of the importance of applying a "gender lens" to STI for development. Indeed, STI policies and programmes will not be effective, equitable and sustainable unless the gender lens is applied so as

to reflect the aims, concerns, situation and abilities of both women and men” (11). People realize the gender equality is one of the components of healthy society and true development is impossible without it. Only understanding of contribution women can make to the development of science and technology can bring positive impact on the development of this sphere.

At the present moment all over the world, with small exceptions, women take an active social role and demonstrate their abilities in a lot of spheres. Nowadays women are active in good production industry, natural-resources management, educational sphere, community management. Women occupy different positions in these spheres and professions in the spheres mentioned above are mostly considered to be female ones. Big percentage of women works in the medical industry, as well. In the developing countries women are also often involved in agricultural sphere and take part in the production of food, selling it and farming. In addition, most of women have additional burden, such as homework and care about the members of the family. India has seen tremendous growth in infrastructure and industrial development over the last few decades. Construction is the second largest industry in India. Considered a totally male dominated field, the construction industry has been thriving on unskilled women labourers.

STATISTICS AND WHAT THEY REVEAL

Statistics regarding the percentage of women in various disciplines and at different degree levels have been reported by Bamji (2005) and are shown in Table 1. The presence of women in Engineering is much lower than in the Sciences, Arts and Medicine at the Bachelor’s level .In all cases except Engineering and Science, the percentages decrease as the educational level increases .There is a small percent increase in women doing Ph.D.s as compared to those doing Masters in Engineering .In all cases, the percentages remain far below what can or should be expected if the discipline represented the ‘true’ presence of women in society. Data from MHRD show the status of women enrolling in the sciences and engineering in India from 1950 to2001 (MHRD2005).There has been a steady improvement in numbers over the years in both streams, with Sciences remaining far more attractive to women than Engineering .There were 20 women to every 100 men in the Sciences(16.7%)and about 2 women to 100 men in Engineering (2%)in197071.The number of women enrolling in the Sciences has improved since then with 60 women to 100men (37.5% women of a total of 160 students) in 2000- 2001, while in Engineering, it has increased to 30 women to every 100men(23% women of a total of 130 students).labourers. in2005 .This trend seems to indicate that more women are enrolling in Engineering, perhaps, based on the assumption at the outset that jobs are aplenty.

WHAT BRING WOMEN TO ENGINEERING?

A simple answer to the question above is‘ the same factors that draw male students’ ,i.e. ,good academic performance, good long-term job prospects, diverse job options after graduation, shorter time and lesser financial commitments than the other coveted profession in India – Medicine. Engineering has one tremendous advantage: one rarely hear so fun employment amongst Engineers, a problem that besets almost every other profession! Sukhatme and Parikh (2006) reported that the percentage of women getting B.Tech. degrees from IIT Bombay increased from 1.8% in 1972 to 7.9% ‘1980 and 23.9% of the total engineering degrees in 1998 showing a steady

and impressive increase in their enrolment in engineering in India (Patel and Parmentier 2005). Despite the impressive increase in women's enrolment, reality after graduation remains harsh, where employers are overtly or covertly rejecting women engineers. Improvement in enrolment and graduation rates has not resulted in improvement in employment figures. Workforce participation of women in 1980 was 34% and went down to 32% in 1998 (Patel and Parmentier 2005). Kerala the state with the highest female literacy rate, had high enrolment figures of 30% with even higher unemployment rates of 35.9% in 1990 and 41.5% in 1998 for women engineers (Sukumaran et al 2006; Patel and Parmentier 2005). Women with engineering degrees have an unemployment rate that was five times higher than that for men. It is important to ask at this point, why are employers so often against hiring women engineers? Traditionally, engineering jobs demanded long and tough hours on-site and in the field. Many women were and continue to be discouraged by employers' expectations or demands and often the discomfort to their male colleagues and/or family members (reasons include safety concerns, lesser physical abilities or stamina, and long hours away from home). These factors eliminate a large portion of lucrative engineering jobs resulting in a much smaller share of the job 'pie' for women engineers. With technological advancements mainly computer-aided design, office based jobs rather than field-based jobs, and better working conditions, women engineers are now able to continue rather than drop out of or change their profession—something the previous generation had to do too frequently! So while enrolment numbers are improving, the percentages (they matter most) are not improving in all cases, and employment after graduation remains a major barrier for a Woman engineer to surmount.

WHY DO WOMEN TURN THEIR BACKS ON ENGINEERING?

A few factors that may explain the small numbers of women in Engineering are enumerated here. Possible solutions are also proposed.

1. Male-dominated disciplines
2. Lack of inspiring role models
3. Women are an insignificant minority with little or no societal, or institutional support
 - a. Lack of appropriate infrastructure, design of products, facilities
 - b. Lack of organizational flexibility (location, time)
 - c. Lack of involvement in decision-making processes, funding opportunities
4. Dull and dreary professional images in society

MALE DOMINATED DISCIPLINE

Without exception, women are a small, insignificant minority in most Engineering colleges, institutions and even workplaces. Lack of interest or aptitude for math and science are definitely not the reasons for low enrolment in Engineering or Technology programs. If Technology promises to be the great equalizer in the Gender Divide, then this promise remains an empty one as long as women remain a token presence in its creation and maintenance. Civil Engineering is male dominated due to the nature of its work. However, it is very important to note that the same site work is being performed by women labourers. In fact, their number is nearly equal to their male counterparts. This is one of the best reasons, why women civil engineers should shed their inhibition about male domination in the sector.

LACK OF INSPIRING ROLE MODELS

Women like men are deeply influenced by the success of others like themselves. With few women engineers succeeding and rising to positions of power and visible success, fewer young women choose to take up Engineering. Most young women and their families have never heard of women engineers, have never met one in their life and would not even consider engineering a possible career option. With very few women taking up civil engineering to continue as their career, there is lack of inspirational stories or personalities to emulate. Lacks of mentorship for women also add to the woes in civil engineering industry. Nowadays, there are many organizations in the domain of construction supporting women working in civil engineering industry. Needless to say, the awareness level is far least amidst professionals. Attending alumni meetings and mentoring should be a part of the professional training to bring women face-to-face with the industry's Who's Who to aid in networking

WOMEN ARE AN INSIGNIFICANT MINORITY WITH LITTLE OR NO SOCIETAL OR INSTITUTIONAL SUPPORT

It is daunting for most women to choose a discipline where they know they will be the only one or a very small 'minority' in class, school and later, in the workplace. Without support groups of like-minded women and in a highly competitive environment that Engineering has always been, women often find themselves 'singled out' and therefore, uncomfortable. Rarely does this 'undeserved attention' have its benefits, and when any small benefit is apparent, male colleagues are often quick to point it out and use it to deride a woman's achievements. Besides these stress factors, there are more overt examples of how women are 'sidelined' within the discipline. Women have been working since ages doing all household chores. Family members and their life-partners have been responsible to inspire or inculcate such possibilities. Lack of societal and family support hamper the will in women to work long hours, travelling long distance etc. The 21st Century women are far fortunate to receive appropriate societal and institutional support on the work front. However, this can still be improvised to encourage women in this field.

LACK OF APPROPRIATE INFRASTRUCTURE AND FACILITIES

The women laborers working on the sites often face improper sanitary conditions. Instead of thinking it as an extra liability, the sanitary conditions need to be improved on the construction sites for women employees to make use at ease. Even though, there are different regulations and standards, which are applied for construction sites, sanitary regulations need to be adhered too.

LACK OF FLEXIBILITY

Women find it easy to work on different engineering disciplines due to the flexibility the job provides. The construction industry needs to be more organized, in terms of, flexible work timings. As of now, flexibility is a huge issue for women to thrive in the field of civil engineering. Women with children often prefer options like flexible working hours, working at home, crèches and day-care centers at the job site or nearby.

LACK OF WOMEN'S INVOLVEMENT IN DECISION MAKING PROCESS

Few organizations are interested in providing facilities that will encourage women to continue working after becoming mothers. In most organizations where women have no representation in decision-making committees or are not appointed to posts where they have decision-making powers.

THE PRESENT AND THE FUTURE OF WOMEN IN THE FIELD OF CIVIL ENGINEERING

Civil engineering has proved increasingly attractive for women, despite a low level of women in engineering as a whole. All civil engineers are not site engineers. When it comes to opportunities in the field, mostly men are preferred to work at site (as site engineers are required to be at site for more than 12 hours a day). However, when it comes to crucial areas like design, quantity estimation, planning, tendering/bidding, contracts, project monitoring & coordination etc., there won't be any gender discrimination. From survey got data that in any company around 50% design department (female). Tendering and Bidding Department Sub Heads (Female). Same with case of Monitoring and Coordination department etc. If you have the right attitude and strong will power just join civil branch and prove to this world that women are no less than men and can do wonders if provided with right kind of opportunities. So, future growth opportunities of a civil engineer for both male and female are the same. Just love the subject. It will take care of your career.

CONCLUSION

In the olden days, women have made it a point to work as civil engineer despite being in a totally different societal setting. Today, with much technological advancement in place, it is the right time to step in and pave ways for fellow women civil engineers. With the right attitude, in future all these small pieces will fall together and one can say that civil engineering is no more a male bastion; it is indeed an equal opportunity field. A good academic performance and better job prospects draw women towards civil engineering. The percentage of women engineers have steadily increased from 1.8 to 7.9 in the last five to six decades. There is a constant rise in the number of women receiving degrees in engineering also with AUTO CAD and other technological advancements; women are now able to pursue their career in the field of civil. Women now enjoying successful careers as engineers will attest to the teachers, career counsellors, even family members who tried to discourage them from pursuing such a "technical, analytical" career. Fortunately, most of these prejudices are eroding. The engineering departments at virtually all universities and colleges are now "gender blind" in admitting applicants. This is one of the major reasons, why women are drawn towards civil engineering in the modern era. Civil engineering is a rewarding profession for women because of its creativity and sheer perseverance with which an idea has to be manifested as a building.

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