

Underrepresentation of women in science and engineering



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Women run the risk of lagging behind in the fields of science and engineering. A wide gap exists between men and women in these fields. Women tend to have overrepresentation in social sciences and humanities, and underrepresentation in science and engineering. Although the number of women in the fields has grown steadily, women remain underrepresented at high levels of these professions. Social norms, culture and attitudes, play a significant role in undermining the role of women in the aforementioned fields. In many cases, the achievement and excellence of women are measured using male oriented standards. Even for those that excel, their salaries are in many cases dissimilar with their male counterparts. However, countries can use several recommendations that can help boost the presence of women in these fields. Inclusion of women in science and engineering is a crucial factor that can significantly accelerate technological advancement in the contemporary society.

Discussion

Underrepresentation of Women in Science and Engineering

There is a marked underrepresentation of women in science and engineering although the contemporary society needs technology most society. Science and engineering are historically According to statistics revealed by Blasdell (19); over 50 percent of the population is composed of women of whom 44 percent is in the workforce but only 13 percent in science and engineering. Recruitment of women in science and technology can help mitigate the drain of engineering talent through the provision significant resources. However, several barriers impede this inclusion and / or advancement of women in science and engineering.

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Challenges and Reasons for Underrepresentation

Social norms and culture come as the most significant factors impeding the advancement of women male dominated professions. Traditions, values and styles lean and suit the male gender has shaped the culture in SET fields.

The culture is not suited for the needs of women in social and learning environments. From time immemorial, women are regarded as caretakers where their work is fundamentally taking care of their families. This social norm leads to a stereotypical view on women where many men regard the abilities of women in these fields negatively. As documented by

Bystydzienski (24), many men respond negatively on the capability of women to excel in technical (science) and engineering fields. The societal

norms dictate that a woman cannot be successful as a mother and a wife while in these career paths. According to the International Labor

Organization, science and engineering are associated with pervasive gender roles that encourage women to engage in 'soft' subjects (hawks and Joan 250). This undermines the excellence of women in the aforementioned fields.

Additionally, women who take SET careers are associated with a loss of femininity in their societies (Hall 82). This impedes their development in the fields since they may feel that their intuitive and imaginative styles do not fit to scientific research. Female stereotyping also is a key element among social norms that impede the accomplishments of women in SET. Women scientists are usually featured as atypical women and atypical scientists. This implies that, not only is their 'deficiency' in science attacked, but also their gender identity. Female norms are more associated with collaboration than competition. However, the societal norms set by men are more competitive

than they are collaborative. However, women are oriented towards win-win settings (Bystydzienski 39). The competitiveness and desire to prove oneself significantly impedes the desire of women to advance in these career fields.

Legal systems to a lesser extent than norms affect women's excellence in science and engineering. In several countries, anti-discriminatory laws require that universities offer differential entry conditions for women. However, the weakness of the legal systems in several other countries (especially developing ones) has left women at a disadvantage in the inclusion of science and engineering programs. Legal trends encourage institutions to alleviate discrimination and other institutional norms and practices that bar women from engaging in SET courses. However, with high levels of female stereotyping in different societies, women still lag behind in their advancement, in these fields (Steel and Emily 91).

Female Dominant Science Fields

Although few women are found in the engineering field, there are other science fields where there is a sizable number. Nursing is one of the most prominent science professions where women are found. Nursing, as a science, attracts a significant number of female students. Additionally, this field has also been stereotyped, and it is more associated with women than with men. One factor that leads to a high number of female nurses is the negative attitude that a man will look unmanly if he joins the course. Hawks and Joan (257) add that women are capable of interacting better with other people than men are. This implies that women can interact with patients more efficiently in hospitals than men can. Additionally, nursing combines feminine values with professional values of support and care. Furthermore, <https://assignbuster.com/underrepresentation-of-women-in-science-and-engineering/>

women are at an added advantage of taking nursing courses since in many cases, men are excluded.

Academic Achievement of Women in SET

The academic achievement of women in science and engineering remains low. The achievement of women in the fields falters especially immediately after the entry in the first year in universities. According to Hall (102), of the 40 percent of the students who entered university in 2010 in USA, 11 percent were female. Once they join institutions of higher learning, their performance may also deteriorate significantly. Lack of confidence in their capability to balance family responsibilities and science career significantly influences their academic achievements in the fields. Additionally, the portrayal of science and engineering male-oriented courses exacerbate their fears of their excellence. Additionally, in undergraduate science and engineering classes, women in many cases feel isolated. They also feel resented by their male counterparts since they think that their opinions are not respected by their male counterparts. Furthermore, women who have high levels of confidence in science and technology classrooms elicit negative responses from their male counterparts. According to sociologists, women also express lower levels of self-esteem than men in these fields do. The combination of these effects affects the academic achievement of women negatively. Many women will tend to mask their academic abilities to evade alienation and ensure that they achieve social success. Hawks and Joan (108) add that women win acceptance through the loss of personal terms. As he observes, women who achieve highly in these fields are likely to lose their gender roles. To avoid this, women recede to standard gender

roles. In such a situation, women do not ask many questions or explore alternative options, but rather, they pursue and follow what they are taught. This significantly affects their academic achievement and they end up lagging behind their male counterparts. To exacerbate the situation, even with their assumption of standard gender roles, the presence of women in a science or engineering class draws a lot of attention (Steel and Emily 125). This inundation with social attention creates an uncomfortable learning environment that may interfere with their academic achievement and/or progress.

In America, women currently earn approximately 41 percent of PhDs in SET fields but make approximately 28 percent of the workforce in these fields. As observed by Nut, the low number of women involved in the workforce is because of a high dropout rate in SET fields. Decreasing the dropout rate of women in SET careers is significantly essential in the pursuit for gender equality since women in SET jobs earn approximately 35 percent more than in non-SET fields (Blaisdell 24).

Cross-gender Disparity in Salaries

Albeit the fight for equality in all fields of life, there still exists a wide disparity between the salaries of male and women workers. In the fields of science and engineering, this disparity is highly pronounced. Data collected through the census in the United States depict a significant dissimilarity between the workers in these fields. In 1999, the average salary for female scientists and engineers was almost 22 percent less than that of their male counterparts. However, this was regarded as a significant increase since this reflected a 25 percent increase from the figures posted in 1993. In 1999, among scientists and engineers who had held their degrees for less than 5

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years, women earned 83 percent of what men earned. Salary differential at this time depended on the field. In life sciences, women earned 23 percent lesser than their male counterparts while in, computer science, the difference was 12 percent. However, the difference has reduced over the years. In 2009, independent surveys by Glassdoor revealed that women earned approximately 93.7 percent of what men earned. This applied for those who had zero to three years of experience. For scientists and engineers who had more than ten years of experience, women earned approximately 89.1 percent of what men earned. Another survey conducted in 2012 reveals that the gap is steadily being closed, albeit at a significantly slow pace. Women scientists and engineers with zero to three years of experience earned 95.2 percent of what their male counterparts earned. For those with over ten years of experience, women earned 92.6 percent of what men earned. Albeit the underrepresentation, it is evident that the salary gap is being closed. Factors such as emphasis on equality between men and women play a noteworthy role in changing these dynamics. Additionally, stereotyping and discrimination are diminishing, and these fields are now more cross-gender than they used to be several decades ago (Hall 124-130).

Cross-cultural Differences in Status of Women in SET

The status of women in science is in many cases vary from culture to culture. This is because the norms observed by one culture may be different from those of another culture. Studies conducted by Blaisdell (29) indicate a wide disparity in the way different cultures uphold women in science and engineering. These differences are more pronounced in societies that have

stuck to their traditions than in the modernized societies. Among the African Americans and other black societies, gender roles are highly emphasized. This implies that women are expected to take care of their families while their male counterparts act as breadwinners. On this note, women need to maintain their femininity in these societies. In these societies, a career in science and engineering is highly associated with a loss of femininity. In this regard, women are regarded negatively in these societies once they take to science and engineering. This cultural stereotyping has significantly contributed to a few black women getting involved in science and technology. Through women empowerment, the number of women taking careers in science and technology in several other cultures or societies has increased. Western cultures are becoming more liberal and, thus, more women are being accepted into these male dominated careers. This increase can be attributed to less strict cultural norms, constitutions promoting equity and discouraging discrimination and government strategies promoting inclusion of women. According to statistics posted by the United Nations (quoted in Blaidell 30), the Asian communities (especially in the United States) have the highest number of women scientists and engineers. Among the Asian communities, SET (science, engineering and technology) courses are considered part of the community. Although their culture also emphasizes on gender roles on women, they show significant liberalism regarding women engaging in science and technology. The above observation indicates that, in societies where cultural norms, discrimination and stereotyping are high, number of women entering into the field of science and engineering is less and vice versa.

Opportunities for Women in SET

Regardless of the challenges, women engaging in SET fields have a multiplicity of opportunities. In the United States, the government has increased its effort in having women included in Set programs. Through affirmative actions, the entry standards for women into university in SET fields are lower than for men. This is encouraging an additional number of women engage in science and engineering. Additionally, other governmental and non-governmental research centers are including more women than it was a few years ago. Additionally, these institutes engage in campaigns and trainings to raise the number of women in science and engineering. For example, through the Executive Office of the President, NASA was involved in a national convention to encourage girls and women to engage in SET. Through their presence, girls had hands-on experience on NASA activities to inspire them in pursuing SET careers (Steel and Emily 200).

Recommendations

Based on the challenges facing women in SET, a lot remains undone. Several recommendations can help increase the presence of women in SET. First, the culture and social norms should be redefined to have an increased number of women in SET. As noted by Bystydzienski (209), women need first to adjust to the system with the system in which they have modest prior knowledge. In this regard, women need to develop coping strategies to have high representation in this field. Additionally, the cultural and social norms of the modern societies should change. Stereotyping and discrimination at entry level in universities are some of the most significant challenges for women wishing to engage in SET courses. With government strategies,

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discrimination and stereotyping can be reduced thus increasing the number of women in SET. Furthermore, a change in the competitiveness in SET can help increase the number of women. According to Blaisdell (21), dissatisfaction and intimidation arise among women when faced by competitiveness at work. To mitigate this problem, group activities and non-threatening environments should be encouraged. Additionally, standards for assessment should be reduced to help women feel integrated. Furthermore, connected teaching can help integrate women in science and engineering. In connected classes, truth is constructed through consensus, but not conflict. This helps reduce intimidation among women.

Conclusion

Inclusion of women in science and engineering can help in the growth of innovation. However, women are significantly underrepresented in SET fields. Social norms and some oppressive legal systems have been found to contribute to this underrepresentation. Even for women who advance in these careers, a marked disparity exists between their salaries and those of their female counterparts. However, women, through government efforts, have a multiplicity of opportunities in advancing in these fields. As identified, several strategies can be used to allay the challenges women face in SET fields. The inclusion of women in SET fields is crucial for growth of innovation thus additional women should be encouraged to join SET courses.