

# Stem Leadership and Gender Gap

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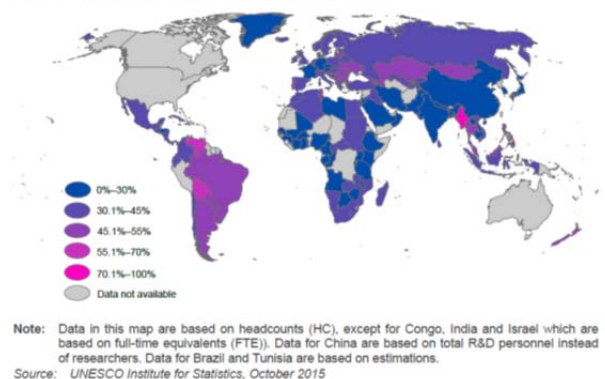
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**Abstract**—The fields of Science, Technology, Engineering and Mathematics (STEM) have always been considered as the foundation of developing economies. They lay down the basis for better future. STEM leadership has become one of the significant areas of research and discussion. The reducing number of students and researchers and in particular less number of females in the field of STEM is a matter of concern for all the nations around the world. According to UNESCO number of women in STEM has decreased drastically. According to UIS (UNESCO Institute of Statistics) data, less than 30% of the world's researchers are woman. There is persistent gap between men and women in doctoral studies and research. At doctoral level the share of female graduates drop to 44% and mere 29% of researchers are women in 110 countries. This growing gap is outcome of various barriers which create hurdles for women to be at parity with men. To reduce this gap the barriers have to be identified. Various researches reveal that factors like double burden syndrome, social factors, starting a family, work place environment and discouragement add to this problem. Women publish less and they even leave their jobs in between, they feel they are paid less as compared to males, they face gender discrimination etc. This paper is an attempt to throw light on issues related to gender gap in STEM leadership and the issues related to reduced number of females in this filed.

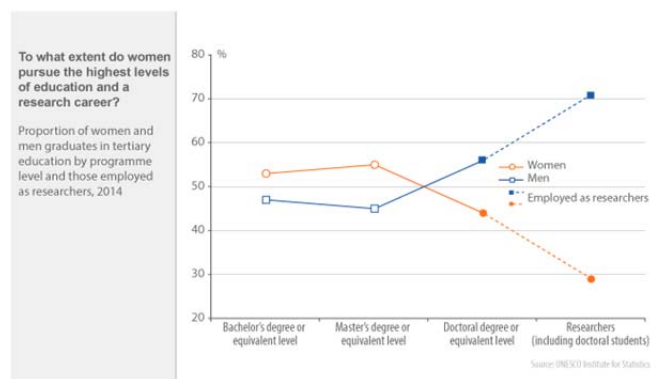
## 1. INTRODUCTION

Leadership is the essence of management. Males as well as females have proven themselves as efficient leaders in different fields. Both genders have equal importance at top level management. With the passage of time females have proven their worth at higher positions although their representation on top level is evident yet their number in comparison to males is quite low. Recently this gender gap has attracted attention of researchers and academicians in various fields; one of the significant area is STEM (Science, Technology, Engineering and Mathematics). STEM has always been considered as the foundation of developing economies. They lay down the basis for better future. STEM leadership has become one of the significant areas of research and discussion. The reducing number of students and researchers and in particular less number of females in the field of STEM is a matter of concern for all the nations around the world. According to UIS (UNESCO Institute of Statistics) data, less than 30% of the world's researchers are women <sup>[1]</sup>.

FIGURE 1. THE GENDER GAP IN SCIENCE  
Women as a share of total researchers, 2013 or latest year available



The vast majority of data are presented in headcounts(HC), which are the total number of persons employed in R&D. This includes staff employed both full time and part-time. The regional averages for the share of females researchers (based on available data only) for 2013 are: 28.4% for world, 36.8% for Arab states, 39.9 for central and Eastern Europe, 47.1% for central Asia, 22.6% for East Asia and the Pacific, 44.3% for Latin America and the caribbean, 32.0% for North America and Western Europe, 18.9% for south and West Asia and 30.0% for Sub-Saharan Africa<sup>[2]</sup>. Women are missing from the ranks of higher education and research <sup>[3]</sup>



Source : UNESCO Institute for Statistics (110 countries with data)

There is persistent gap between men and women in doctoral studies and research. At doctoral level the share of female graduates drop to 44% and mere 29% of researchers are women in 110 countries<sup>[4]</sup>.

Studies around the world reveal that females face many obstacles in the field of STEM. Even in a developed country like USA gender gap in STEM exists, especially in the field of Physics, engineering and computer sciences. Barriers like discrimination, implicit bias, life style choices, family obligation, lack of role models and mentors, discrimination, prejudice & bias are prevailing<sup>[5]</sup>. In Australia, only 28% of employed STEM qualified workforce aged 15yrs and above were females. Reasons behind were – occupational segregation, industrial segregation, cultural stereotypes, career breaks (resulting into financial penalty), the gender pay gap, women leaving the profession to bring balance between family and career responsibilities, lack of women in leadership roles in STEM field and discriminatory practices with in work place<sup>[6]</sup>. In case of Europe also, men still dominate the number of STEM graduates in higher education. In the European Union 42.4% of tertiary education graduates in science, mathematics, and computing were women in 2014. This gap is even wider in individual countries: France (25.6%), United Kingdom (22.4%), Finland (21.5%), Germany (19.3%) and Switzerland (14.7%)<sup>[7]</sup>. Where as in Indian context, a latest study discloses that females from STEM fields are facing feeling of inadequacy and not fitting in. At high school smaller percentage of girls choose STEM career as compared to boys. One of the study found that 40% of female chemist and chemical engineers were discouraged for science and mostly discouraged by their college professors. Females leave their jobs early or in mid career just for the reason that they have to struggle a lot to maintain work life balance. 41% of women in technology leave their jobs after 10 yrs experience as compared to 17% of men and 56% women in technology leave at mid – level. It indicates that at top level there will be lack of gender diversity. Just 6% of CEO's are women, 12 % of CEO's in Biotech/pharmaceuticals and only 4% in Health care<sup>[8]</sup>. About 50% Indian women drop out of corporate employment pipeline between junior and mid level<sup>[9]</sup>. 81% of women perceive gender bias in performance evaluation<sup>[10]</sup>.

## 2. BARRIERS FACED BY FEMALES

This growing gap is outcome of various barriers which create hurdles for women to be at parity with men. To reduce this gap the barriers have to be identified. Following are few of them.

- Gender bias is faced by females as males are given more priority at work place. They are even considered to be better than females.
- Females get Discouraged for choosing STEM field, as it is considered a tough area or not suitable for females.
- Male dominated culture which makes them feel unwelcomed at work places.

- Lab coat culture is also prevalent where extreme hours are spent toiling over experiments.
- Penalisation of women who need flexibility around child care.
- Gender bias in performance evaluation.
- Double burden syndrome is there, it is considered that family and household duties are primarily women's responsibility.
- Lack of female role models or mentors in STEM

## 3. CONCLUSION

It is evident that females around the world have fewer representatives at top level in field of STEM. They are facing many problems at work places and they struggle to maintain work life balance. Females are still not at parity with men; their talents still need to be explored. There is a need to change the orthodox thinking and behaviour of both males as well as females who still believe in gender discrimination. Moreover there is need for more research in this area as ample data is not available, as the review of literature reveals that there are many factors or barriers which affect females but it doesn't reveal which factors have higher contribution or playing major role in reducing number of females in STEM fields, it can help in reviewing policies and laws so that female talent get optimally utilised

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