

# Women in Technology Advancement

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## Abstract

*This research paper discusses the participation, encouragement and development of women in field of technology advancement. A major prospective in most nations is not only limited to number of female going to school, but also limited educational opportunities for which they can acquire knowledge. This includes more particularly, how to involve less participation and acquiring knowledge for women in technical education. This research lay emphasis to the factors and their solutions which acts as a barrier to facilitate women's involvement and continuation in technical education and technology advancement. Education techniques and learning centers play a vital role in determining women's interest in technical knowledge and in serving similar opportunities to access and take an advantage from quality technical education. Getting more number of women into this field and career requires integrated responses that can extend up to sectors that engage women in figuring out solutions to tackle challenges. Executing all these moves towards gender equality which can help men and women to involve fully and develop a sustainable nation.*

**Keywords:** Participation, Engineering, Technical education, Issues, Women, Technology, Measures

## INTRODUCTION

Engineering and Technology is important factor for global economy development. Engineering and Technology is a wide industry that plays a crucial role in stabilizing the competitive era of the world economy. Apart from this, the industries put efforts to assign a wide workforce. Women display only 12.9 percent of professional career growth in engineering till last year 2017[1]. This inequality of percentage in gender imbalance is not only bad for industry, but although leads negative impact for the nation's economy. NGOs and research fellows, which can be motivated by gender equality, figure out that women continue to remain focused in particular industries, which can be low remunerated and low trained. Motivating more women into engineering and technology advancement would put a higher position of women in the economic market, by enhancing access to better remuneration and progression chances [2]. Engineering rewards good wages, so women are encouraged to make careers in this field. Moreover, broadening women's participation in engineering and technology advancement can release the inner potential into recruitment in particular field [3]. Ensuring the women education in technology advancement is an initiative to develop human rights, scientific and development point of view. The gender inequality in education regarding to technology advancement and achievement is an objective of intense research for several years.

## BACKGROUND

This research paper is for analyzing the role of women in technology advancement and engineering. Although the number of female engineers is quite low. Since the research still shows that there are few female engineers and even the percentage of female engineering students are still low as compared to male engineering students hence need to encourage more female students in high school to study engineering and technology advancement in the current global economy. This is due to some factors such

as lack of enough role models, misconception of what is to be an engineer, lack of enough confidence mainly in the female students especially comparing themselves with the male students [4]. Engineering communities have been exploring a various measure, activities and techniques to attract and retain more students, especially women and minorities, to technology advancement and engineering degree programs. This research briefly provides the efforts of a plan for actively recruiting young women into undergraduate engineering and technology education. It also describes a series of activities aimed at improving the retention rate of students already in the programs, particularly during the fresh intake every year. Such recruitment and retention efforts are critical to the country's efforts to increase the number of engineering professionals, since in the 21st century engineering has become the best way towards development of nation [5].

## OBJECTIVES

Women remain under represented in technology advancement and engineering workforce, although to a lesser degree than in the past, with underwhelming statistics along with lack of representation in the field, factors do not help to build attainable environment for women to become a viable human in this path [6]. It's just amazing to encourage a female child in engineering and technological education. Women build confidence through workshops along with creating encouraging environment which creates more opportunities for women in the developing world.

Some of the focused objectives are as under:

- *To provide carrier information and encouragement to pre-college girls and young women to continue achievements in engineering and technology advancement carriers.*
- *To encourage women to matriculate at pursue of engineering degrees.*
- *To encourage performance in science and technology to benefit the society.*
- *To promote gender equality and empowerment to girls and women by medium of education.*
- *To recognize involvement that motivates women's interest in and participation with technological studies*

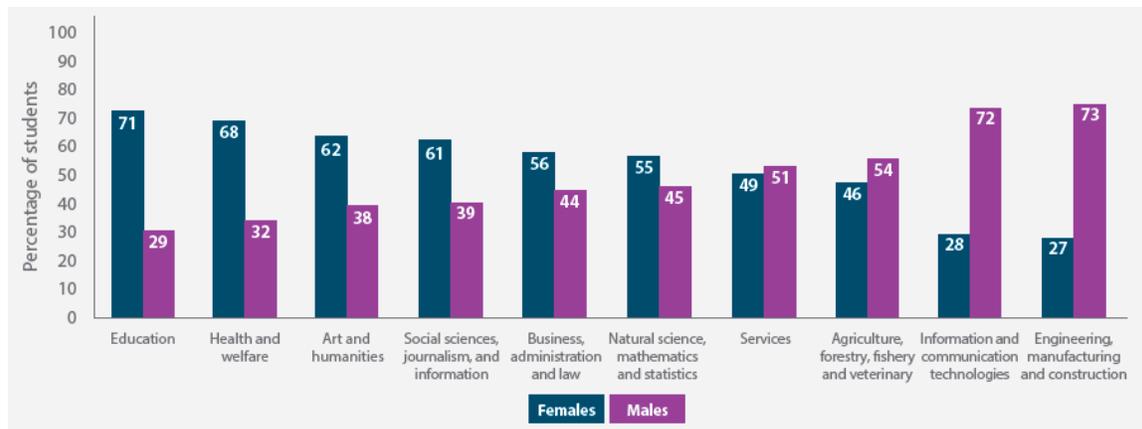
## ENCOURAGEMENT TO STUDY TECHNICAL EDUCATION

With increase in Engineering and technology advancement in 21st century, there is need to increase in the number of females in engineering; so as to improve technology in our society. This condition is all over the world in spite of culture and tradition.

Most students in high school lack knowledge on what an engineer does. Some high school girls think that engineers are laborers especially the technician and therefore they believe that most physical strength is required to handle equipment, tools and machines and therefore a misconception of untidy and dangerous working condition which is dominated by man [7].

The female students decide to choose engineering due to family members and relatives who are successful in engineering works. It is therefore important to raise awareness about female students to get engaged in studying engineering and even students of younger age [8]. Teachers in high school should be encouraged to talk more about engineering in their classes and mention some famous female engineers like Edith Clarke, who became the first women to hand an electrical engineering degree in 1918 from Massachusetts Institute of Technology. In 1921 she discovered technique to solve electric power transmission line issues. Another example to be taken of Martha Coston, who wrote engineering history books which is used by US Navy today.

Some of the statistical data of acquiring higher education by area of study from 2014 to 2016 is as under:

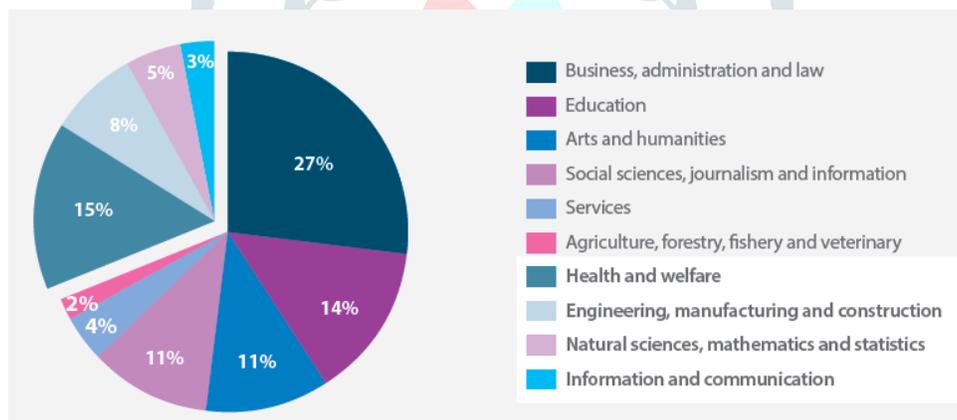


*Fig. 1: Share of female and male scholars involved in higher education by area of study, by global average [9]*

(The data source: UIS 2014-2016). within the female student population in higher education globally, only around 30% chose technical field for studies.

Inequalities are seen in different fields. Female students' involvement is not high in Information and Communication Technology (3%), statistics and engineering (5%), manufacturing and construction (8%), the greatest is in health and welfare studies (15%) [9].

The pie chart representation of female students involved in higher education is as displayed:



*Fig. 2: Allotment of female students in higher education by area of study*

*Significant gender differences in higher education enrollments by fields of study. 115 countries and dependent territories.*

## **FACTORS DOMINATING WOMENS'S PARTICIAPTION IN TECHNOLOGY ADVANCEMENT**

There are various and interrelated points which dominates female involvement, achievement, and development in engineering and technological studies, all of which jumbles up in difficult ways. In order to digest these factors and interrelations between them, this article points an ecological scheme which compiles these factors at institutional, societal, family and individual level.

- *Institutional factors*: This level takes school related factors under consideration. This includes the surroundings, professors, teaching methods, the course contents and educating materials and computation [11].
- *Societal factors*: Choice regarding the area of study or job is taken under consideration for male and female who are much involved in socialization process. Cultural and Societal rituals, wider measures of policies, gender equality, and mass media are dominating factors [11].
- *Family factors*: Guardians or parents, the wider, the more important role in modifying girls' behavior towards technological education regarding the motivating and demotivating them for the studies. Family interest and expectations regarding technical education is affected by their literacy level, societal status, communalism, and broad social customs [11].
- *Individual factors*: Many experts and researchers have discovered that biological factors that bring down cognitive skill and behavior, learning, etc. The factors included here are hormones, Neurological structure of human, Genetics, and Spatial and language abilities [11].

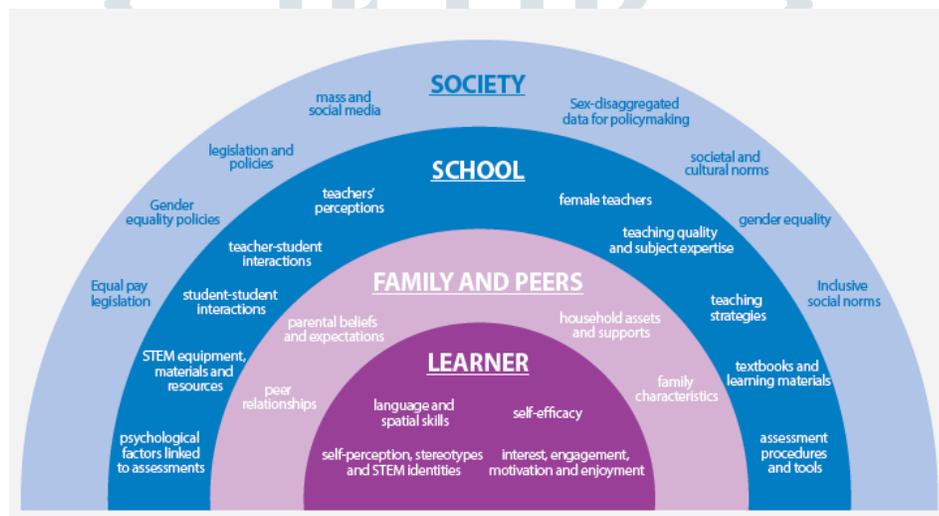


Fig. 3: Environmental frame work of factors dominating female involvement, achievement, and development in technical studies. [9]

## MEASURES TO OVERCOME ISSUES OF WOMEN INVOLVMENT IN TECHNOLOGY ADVACEMENT

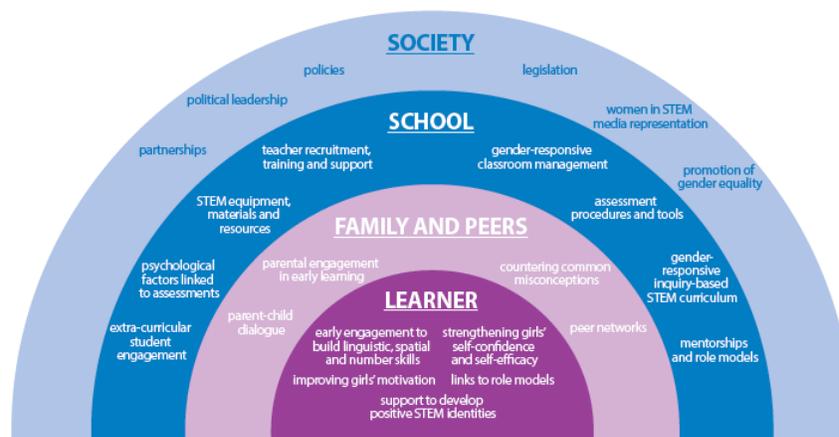
The framework shown in previous article illustrates that there is no any one factor alone that can affect women's involvement in technical advancement.

Non-negative results yields as a result of involvement among factors at the school, societal, individual and family and peers levels.

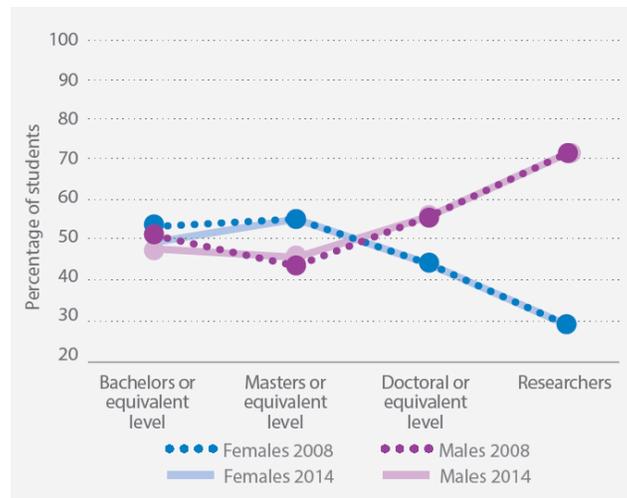
The various measures at different levels are explained as below:

- *Developing self-esteem and self-confidence*: Women with better self-confidence and belief in their abilities in technical knowledge can conduct better at institution and have more chances of pursuing good technical education [12]. Chances for practice in fields like particularly in engineering can increase women's self-esteem and interest in that field.

- *Motivating interaction between parent and child:* Parents can pump up their children's preparation and promotion and can perform a vital role in uplifting women to participate in technical education, if proper a proper guidance. The measure, which was formulated to support interaction in between guardians and their children about the importance technical education [12].
- *Assigning female and male professors:* Education planners require to explain limitations in highly educated professors for technical education, and their enrollment in slum and remote areas. As there are possibilities in some cases that female professors can have a remarkable effect on female students' to study technical education [13].
- *Promoting positive images of women through media:* Mass media involvement is needed to encourage more diversity in gender representation in technical work fields, and to challenge common issues related to gender related abilities. Children should be facilitated with media education, to control harmful effects, and to involve with digital approaches.
- *Exploring knowledge without limits:* The surrounding also elongates ahead of the institution. Workplaces, museums, gatherings, and the rest of space, all provide better opportunities for acquiring knowledge and for training girls' interest in technical education. Logical science education, many times allotted by museums or technical centre, can also give chances to refurbish technical skills, increasing knowledge and importance of technical education, use of scientific approaches, and increasing women's emotions for scoring and achievement [14].
- *Improving system-level challenges:* Education-system level uplifts in recents years having positive effect on the quality of technical knowledge delivered by professors at knowledge centres, benefitting to both girls and boys. The education sector can execute another different steps at the level of formulating rules and regualtions and around proximity area of schools, to establish womens' interest, confidence, involvement and career interests in techincial education.



**Fig. 4:** Measures to overcome the issues of women participation in technology advancement. [9]



**Fig. 5:** Ratio of men and women in higher studies and research, world wide average [15]

Only around 30% of all female students select STEM-related fields in higher education. 110 countries and dependent territories. (Data source: UNESCO 2008-2014)

## CONCLUSION

The major focus of this article is to provide various information related to encouragement of girls and women to participate for acquiring technical education. They are also encouraged to benefit the society through technology advancement and promote gender equality. It has been also concluded that the female student population in higher education world wide, is only near to 30% which chose technical field for studies. It has been also observed through area of study, that females students' involvement is gradually trending on an average through area of study. Adding to these, various family, societal, individual and institutional factors dominate on the women's participation and progression in technology advancement. Few steps to overcome the issues can be taken under consideration and must be implemented for the upliftment of women's role in technology advancement.

## REFERENCES

- [1] UNESCO. 2016. *Sharing Malaysian Experience in Participation of Girls in STEM Education*. Geneva, UNESCO International Bureau of Education
- [2] Anitha kurup, impact of science and technology on women, yojana, december 2016
- [3] Agbara williams, Chagbe m. Becky, Achi t. Theophilus, *Challenges of women in technical and vocational education: a case study of federal college of education*, International journal of vocational and technical education, Vol. 10(1), pp. 7-13, January 2018
- [4] Rouf ahmad bhat, *Role of education in the empowerment of women in india*, Journal of education and practice, issn 2222-1735, Vol.6, No.10, 2015
- [5] UIS. 2016. *Leaving No One Behind: How Far on the Way to Universal Primary and Secondary Education?* Paris, UNESCO Institute for Statistics
- [6] Khushboo singh, *importance of education in empowerment of women in india*, a peer reviewed refereed international research journal, Vol. 1, Issue 1, August 2016, pp. 39-48
- [7] Dr.m.shunmuga sundaram, dr.m.sekar, a.subburaj, *Women empowerment: role of education*, international journal in management and social science, issn: 2321-1784, vol.2 issue-12, December 2014
- [8] Women in science and engineering (WISE) and Royal Acedmay of Engineering (RAE) (2014) University Technical Colleges; opening up new oppurtunities for, Bradford.
- [9] Women in engineering. *The GirlEng Guide to become an engineer* <http://www.womeneng.org/>

- [10] National Science Board. 2014. *Science and Engineering Indicators 2014*. Arlington VA, National Science Foundation.
- [11] IFF Research (2013) *Engineers and Engineering brand monitors*, London; Engineering UK
- [12] Hill, N. E. and Tyson, D. F. 2009. Parental involvement in middle school; A meta-analysis of the strategies that promote achievement. *Developmental Psychology* Vol.5, No.3
- [13] Mundy K., Costin, C. and Montoya, S. 2015. *No girl left behind - education in Africa*. Global Partnership for Education Blog. <http://www.globalpartnership.org/blog/no-girl-left-behind-education-africa>
- [14] UIS. 2016. *UIS Data Centre*. Montreal, UNESCO Institute of Statistics. <http://data.uis.unesco.org/> (Accessed 12 June 2017.) The Figures 6 and 7 were developed using software developed by StatSilk. StatSilk 2016. StatPlanet: Interactive Data Visualization and Mapping Software. <https://www.statsilk.com>
- [15] UNESCO. 2016. *Incheon Declaration. Education 2030: Towards Inclusive and Equitable Quality Education and Lifelong Learning for All*. Paris, UNESCO.
- [16] UNESCO. 2012. *From Access to Equality: Empowering Girls and Women through Literacy and Secondary Education*. Paris, UNESCO
- [17] Watermeyer, R. and Stevenson, V. 2010. Discovering women in STEM: Girls into science, technology, engineering and maths. *International Journal of Gender, Science and Technology*, Vol. 2, No. 1, pp. 25-46.
- [18] Atkins(2013) *Britain's Got Talented Female Engineers*. <http://www.flipsnack.com/95A89DCF8D6/fhp0xae>
- [19] UNESCO. 2016. *Global Education Monitoring Report 2016: Education for People and Planet: Creating Sustainable Futures For All*. Paris, UNESCO.
- [20] Kermani, H. and Aldemir, J. 2015. Preparing children for success: Integrating science, math, and technology in early childhood classroom. *Journal Early Child Development and Care*, Vol. 185, No. 9, pp. 1504- 1527.

