



WOMEN, SCIENCE, EDUCATION AND EMPOWERMENT

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ABSTRACT

This paper aims at analyzing the gender gap in the field of Science. Education is very much linked with empowerment. If women will get proper education they can be economically independent. In this way women can empower themselves by building up their own agency. The name of Asima Chatterjee is very relevant because apart from facing gender discrimination she showed up her potential. She was an excellent Academician, teacher, researcher, inventor and politician. She proved the fact that women can perform multiple duties. They are blessed with various qualities. She was awarded many times, set up many institutions. She sacrificed her whole life for the development of science. She gave precedence to science to above all. Actually this paper wants to dictate the fact that we have to look at the merits or qualities, not gender. It is not desirable for a society to discriminate between male and female in science as well as in other fields. We have to think above the childbearing, rearing and caring attitude of the women. Women are also human beings. It is quite natural that they have some aspirations and it is the responsibility of the society to fulfil their dreams. We have to move towards a gender neutral society where women can be treated as human beings and there will be many Asima Chatterjees, not one.

KEYWORDS: Education, Science, Empowerment, Discrimination, Gender Gap, Masculine

INTRODUCTION

Asima Chatterjee was a well known chemist of India who was born on 23rd September, 1917 at Calcutta. She received her early education in this city. Her father was Dr. Indra Narayan Mukherjee and mother was Smt. Kamala Devi. After receiving school education Asima Chatterjee admitted to Scottish Church College and acquired B.sc degree from that college in 1934. She completed her M.sc from Calcutta University in the year 1936 and D.sc in 1944 respectively. She was awarded D.sc by the University of Calcutta in 1944 in the merit of her thesis named "The Chemistry of Plant Products". She completed her post doctoral research from University of Wisconsin, USA after that. Asima Chatterjee started her teaching career at the Lady Brabourne College, Calcutta. She was the professor and head of the department of that college till 1954. She joined as Reader at the University College of Science. She became the Khaira Professor of Chemistry in 1962. She was actively engaged in research since 1937 and made significant contributions in the field of alkaloids, terpenoids, coumarins, organic analytical chemistry and reaction mechanism. She was the first in India to be conferred a doctorate of science by an Indian University in 1944. She died in the year 2006. Her contributions will be discussed in the following section.

Her Contributions

Asima Chatterjee has significant contribution in alkaloids, poly phenolics and terpenoids. Her pioneering work is on the alkaloids of *Alstonia*, *Kopsia*. Professor Chatterjee has investigated the chemistry of almost all the principle types of indole alkaloids known today. A significant contribution was the isolation and characterisation of gessoschizine, a key precursor in the biogenesis of indole alkaloids from *Rhizya stricta*. The objective of this paper is to show the gender gaps in scientific research centres and apart from discrimination women like Asima Chatterjee showed their excellence. In this way education helps women in building up their own agencies and empower themselves.

Apart from her various contributions in chemistry she has been a member of many professional bodies such as Sigma XI of USA, Indian Chemical Society, Indian Association for the Cultivation of Science, Indian Science Congress Association, Indian Academy of Science educational Board, Indian Journal of Chemistry and Chemical Society. She has been awarded and honoured many times. She received Nagarjuna Gold Medal in 1940, Prem Chand Roychand studentship in 1942, Mount Medal in 1944 and Bhuvan Mohini Das Gold Medal in 1981 from CU, Shanti Swarup Bhatnagar prize in 1961; INSA Fellow in 1961; Women of the Year and Silver Medal by Bengal Chamber of Commerce in 1975; president of Indian Science Congress in 1975, Sir C.V. Raman Award by UGC in 1982. She awarded Asutosh Mukherjee Gold Medal by Indian Science Congress in 1989 and Padma Bhushan in 1975.

Gender Gap in the Field of Science

Though in the field of science some women show their expertise but still women are lagging behind in case of studying science. There is also a gender gap in our society where women are supposed to study humanities and men concentrate on science. Still parents spend more on boys' education than girls. Though in Western society women held good positions in scientific jobs and research but in our country the picture is different. Women do not get proper opportunities in research centres. Apart from this very few scholarly works has been done on women scientists of India. Indian Women Scientists 'Association was created first in 1973 in Mumbai which helps in collecting data about women scientists. In the report of UNESCO in 2012 on Gender and Science it has been declared clearly that women are underrepresented in science or scientific research or any kind of decision making levels. It is stated in the report "Science cannot continue to deprive itself on the full scientific potential of ever half the world's population. Science is a key to knowledge; for women to gain access to knowledge and achieve gender equality women must have access to science." UNESCO reported that it is the failure of the society to assess the full potential of women power or abilities. Women can be agriculturalists, gardeners, animal-breeders or teachers, doctors, lawyers, scientists etc. UNESCO constantly tries to establish gender equality in our society and it was the top strategic priority. It aims at establishing an equilibrium society or abolishes gender gap in our society. Very interestingly UNESCO tied up with L'OREAL for supporting women scientists. It is also trying to bring women to conduct more scientific researches or work at the conferences of Science. As a result The Biosphere Young Scientists Research Grant Scheme is introduced to encourage women in scientific researches. UNESCO is also trying to reduce the gender gap in ocean science capacity.

Education is the backbone of women's empowerment, strength, prosperity, development and well being. But we see gender discrimination in almost every spheres of life. Women are being exploited and marginalised in all spheres of life-education, economics, politics etc. So, now it is the time to abolish the gender inequality from our society and make our women empowered. Education is the only thing which can reduce discrimination. By receiving education women can

be economically independent which would empower them automatically. In some fields women are lagging behind men like science and scientific research. Women are not receiving proper scopes to conduct scientific research. The name of Asima Chatterjee is well known in the field of chemistry and scientific research. She has created an example and showed that by getting proper opportunities women can show their potentials in different fields. But she had to face different types of gender discrimination when she was carrying on her scientific research. To ameliorate the social discrimination and gender biases women require more strength. This strength would come from education. So education is the most essential thing of human development. Education is an essential agent of social change and development. It would bring modernisation in a particular country. Once Jawaharlal Nehru said "If you educate a man you educate an individual, however if you educate a woman you educate the whole family. Women empowered means mother India empowered." So it is the responsibility of our society to give women the proper access to education which would in return educate the whole society.

Though women constitute the half of the population of the world, they denied education in many ways. They do not get equal opportunities in many cases. As a result feminism took birth from all the grievances faced by the women in different parts of the world. So the most important objective of the feminist movements in different parts of the world is to spread proper education among women which would in future empower a nation and bring social development. There is no doubt that if women will get proper access to education or equal opportunities like men they would show their potentials. Some eminent women like Indira Gandhi, Pratibha Patel, Kiran Bedi, late Kalpana Chawla, Sunita Williams and many others showed their expertise in different fields and proved the fact that they can help in national development. So now it is the time to look forward and try to create a gender neutral society. The name of Asima Chatterjee must be mentioned here who has made a significant contribution in the field of chemistry. Awarded many times she was the first woman who was appointed as the general president of the Indian Science Congress in 1975. She received all round praise for her DSC thesis and later received honorary DSC degrees from Benaras Hindu University as also the Universities of Burdwan, Kalyani and Vidyasagar. Asima Chatterjee is popular for her contribution in medicine of cancer, anti-epileptic and anti-malarial drugs. She founded vinca alkaloids which are used in chemotherapy for the treatment of cancer. She also invented Ayush-56 which is an anti-convulsive drug and uses for treating epilepsy. She also invented many anti-malarial drugs.

So there is no doubt that empowerment is very much linked with women's education. If we look at Indian history we may realise the condition of the women in different periods and their access towards education. In the Rig-Vedic period women received proper education like men but in the later Vedic age they were denied education and the condition became worse after that. When the Muslims invaded India Hindu women were kept in seclusion. In the British period some liberal thinkers both Indian and British aimed at educating Indian women though there was a demand for women who would be trained in English culture among the Bhadrakalok class. Bethune, Raja Rammohan Roy, Vidyasagar, Swami Vivekananda tried hard for women's education. Vidyasagar spent his whole life to improve the deplorable condition of the Indian women. After independence women have to face a lot of problem in getting equal opportunities. The age old mentalities against women's education and improvement create problems in making gender neutrality. It is very pleasing that the female literacy rate has increased in our country than male literacy rate. In 2001 only 54.16% Indian women were literate but it has increased to a large extent in the year 2011 where 65.46% were literate. The growth of female literacy rate is 11.30% as compared to 6.29% of that of male literacy rate. So women's education is very much important for the overall development of a country. Educated women can not only provide education to the girl children but they can teach other

many essential things also like proper human behaviour, ethics, morals, etiquettes etc. There is no doubt that women's education can also reduce child mortality rate and uncontrolled growth of human population.

Science is traditionally preserved by men for a long time and social and cultural taboos secluded women from the scientific research and study. In present society women are also lagging behind men. Apart from cultural and social causes several other barriers restrict women from entering into scientific research and also the absence of women role models in the top most researches, the new generation also dare to enter into the field. The biased educational policies also restrict women from scientific research. Actually we need proper education system and women's education is an essential thing in uplifting the condition of women and mankind. Mothers' education is also very important because a mother will teach and inspire her children properly. It will reduce gender biases. Increased representation of women in science will help in the development of the nation and we have to understand the fact. Very few women showed their excellence in science. In ancient India Maitrayee, Lopamudra, Gargi, Apala all they were educated women who had equal potentials like their male counterparts. Leelabati was the daughter of great mathematician Bhaskaracharya who was also a philosopher and mathematician. Being a talented woman she did not show her expertise in mathematics or science and did not write any book like her father. In the Muslim period women lost their expertise in science and other fields also. In the British India some Indians and British officials took initiative to set up different schools for women. At first very few women admitted into schools and they were doubtful with the educational policy of the British government. Gradually women came forward for taking education. In 1882 Pandita Ramabai forced Hunter Commission to allow women to study medicine and become trained doctors. Before that women had to struggle a lot for studying medicine. Kadambini Ganguly and Anandibai Joshi had to face gender discrimination while studying medicine which was considered predominantly a male's occupation. There was a demand for women doctors because many female patients preferred female doctors. So the Madras Medical College admitted few girls for a certificate course in medicine in 1875. In 1885 Lady Dufferin established The National Association for the enrolment of the women in science and education. Actually science is considered as masculine and most of the women believe that they are not capable of understanding science and scientific ideas properly. It is mentioned in the article 'Women and Science Education in India: A Saga of Marginalization' that "The agents of socialization in India generally train girls in such a fashion that they generally lack assertiveness. They also learn to accept the stereotyped feminine role. However, they do not feel the urge to study science." So, the objective of the paper is to establish the fact that how gender discrimination works in the field of science. But apart from that scientists like Asima Chatterjee and others prove their genius and potential. They also established the fact that if equal opportunities are given to men and women, women can show their excellence and in this way they can empower themselves by building up their own agency. In case of getting general education women are also deprived in this 21st century also. Dropout rates are larger among women than men and the field of science is no longer an exception.

If we look back to the late 19th and early 20th centuries, some British officials and liberal Indian thinkers aimed at educating womenfolk. But their main intention was to create better housewives rather than professional women. There was a demand of creating Victorian type perfect lady who would maintain household jobs more perfectly than anything else. Dagmar Engels in her book *Beyond Purdah* declared "By 1900 the desirability of women's education was accepted by most reformist middle-class families. But women were educated to make better mothers and housewives rather than to earn money." After 1900 orthodox middle-class accepted the necessity of introducing female education but apart from teachers

and very few doctors women were not allowed to any other professions. The patriarchal society actually determines the

role of men and women and it restricted women's participation in any other professional jobs. The real intention was to create women to become perfect wives and daughters. The western cultured ladies had huge demand in the marriage market as the western educated middle-class Bengalis started preferring women trained in European culture. Studying science was also restricted to women where a woman like Asima Chatterjee set up an example for us. Her excellent academic background and her tireless work and researches in science prove the fact that women do not lack scientific knowledge. The patriarchal society suppresses the potential of women and the gender discrimination in different fields reduces the rate of women participation in scientific research. There were many women scientists in India like Radha Balakrishnan, Meenakshi Banerjee, Manju Bansal, Chandramukhi Basu, Sudha Bhattacharya, Archana Bhattacharya, Rajani A. Bhisey, Bimla Buti and many others. These names of eminent women scientists prove that women do not lack scientific knowledge; the main thing is gender discrimination.

Neelam Kumar edited the article named 'Women and Science in India- a Reader' where it has been said that it is the patriarchal society which restricts women from scientific research. The discipline of science is considered as masculine where women are not welcomed. The author wrote that many talented women scientists were denied to practice scientific research for this reason only. He wrote, "when imaging 'a scientist' many people think of a 'mad' man with curly hair, surrounded by bubbling test tubes, wearing a white laboratory coat. The image is seldom replaced by the likes of Marie Curie. But to name or think of an Indian woman scientist would be difficult even for most of science graduates. Breaking the jinx of the stereotypical image of an 'Indian woman', and to visualise her as a scientist is still a cherished idea. This, of course, is an issue which is informed by the patriarchal mindset of a society, but science with its 'universality, objectivity and rationality' has also perpetuated an idea of being a 'masculine' discipline." He also said that the gender gap widened after independence.

In another place the author said that Anna Mani, Asima Chatterjee and Lalitha Chandrashekhar, the three women scientists worked under the supervision of C.V.Raman's laboratory at Bangalore. They were denied to enter into the laboratory just because of being women. He wrote "He blatantly denied admission to these women in his Laboratory on the ground that they were women. Sur contends that 'their histories embody a quagmire of contradictions-of privilege and penalty, of exaltation and damnation and of power and subservience'."

Namrata Gupta and A.K.Sharma also pointed out the concept of "triple burden" of women scientists. They said that along with the burden of household work and professional work women scientists have to face the gender discriminations in different scientific research centres. All these are the barriers that restrict women in building up their own agencies and empower themselves. Actually empowerment means an overall development. Women cannot be properly empowered if their entries are restricted in some areas of educational institutions and it is not desirable also. Merits and talents need to be the main concern of institutional development, not gender. According to the country report of the government of India, "Empowerment means moving from a weak position to execute a power."

CONCLUSIONS

Education is the only thing which would reduce discrimination but discrimination in educational institutions is another big problem. Proper education can empower women. Women would be empowered by building up their own agency if there would be no biases. The objectives of education would be fulfilled when there would be no discrimination

in any field. Talents cannot be compromised in any way and we have to think of the exploration of talents in our society which would be helpful in national development in near future. We are dreaming for a society where men and women would really work together in different affairs and we all are waiting for that day only.

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