Program Strategy Paper 2011-2015

Feminist Approach to Technology

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A background

Technology is the application of science for the benefit of human beings. This includes the tools we use for communication (mobile phones, the internet and radio), the technology that produces electricity, various forms of transportation, as well as the machines used to monitor health. Technology has been integral to human society, from the discovery of fire in the Stone Age to the manipulation of metal in the Bronze or Iron Age. Yet, as in other many fields, over the centuries, men and their inventions have dominated the scientific and technological discourse, while the contributions of women in science and technology have not been much recognised. In spite of well-known examples before us like Kalpana Chawla and Marie Curie, the idea of women and girls "doing" science is still somewhat alien. One does recall the first "man on the moon", but does anyone know that the first computer programmer was a woman[1]? It is important that women take their rightful place in these fields too, as they have in many others. In personal, social or professional spaces, women need to engage equally in technology, take initiative for their own learning and be comfortable in understanding and experimenting with it.

A feminist approach to technology is an outlook that questions the existing structures of technology and seeks to incorporate women as equal partners within it. It critiques the design, use and impact of technology. Equal participation of women in technology and decision-making around it helps ensure that widely used technologies do not affect women adversely.

Women in technology

Worldwide, the presence of women in the workforce has visibly increased in the past decades. Women can been seen in political, economic, social and cultural fields, participating, contributing, leading and making decisions. Statistics reflect the fact that girls are excelling at the primary and secondary school levels. However, the numbers do not translate into higher membership in professions relating to science and technology. This is a worldwide occurrence.

This trend, as explained by Sophia Huyer, Executive Director of the Gender Advisory Board of the UN Commission on Science and Technology for Development (UNSCD), is called the

[1] Ada Lovelace (born as Augusta Ada Byron) a mathematician, published her first programmes in 1843, for use with the mechanical digital computer that had then recently been developed by Charles Babbage.

"Leaky Pipeline"[2]. This concept refers to the steady attrition of girls and women throughout the formal science and technology (S&T) system, from primary education to S&T decision making. The Western context that Huyer describes is clearly mirrored in India too. The inadequate number of women in professions of technology-design and in positions of decision-making has caused concern both in development circles as well as in technology-based industries. In October 2004, the Indian National Science Academy (INSA) published a report[3], where it cited reasons for the decreased number of women in science professions that includes gender-insensitive organisational practices, workplace discrimination and sexual harassment. As the Executive Summary mentions[4], "many (women) would have fallen by the wayside … unable to cope with the triple burden of home, work and societal prejudices including gender-related nepotism".

The three main arguments for having more women in technology are:

***For development and growth*:** From a development perspective, in general a negative relationship has been found between gender bias and economic growth[5]. Gender bias in technical education can lead to a shortfall of trained human resources for the industries. Women in managerial positions bring slightly different perspectives on sustainability and ecological concerns to technology creation and use.

***To further women's rights*:** Exclusion from the technology sector also implies that women tend to get crowded into lesser-paid, low-skilled jobs, leading to inequities in economic rights, leadership roles and decision-making control for women.

To ensure gender equality: Literature on feminist technology shows that the missing perspective of women from technology design can actually deepen existing structural gender biases. Their under-representation in technological and scientific development

[2]Huyer, S. 2002."The Leaky Pipeline: Gender Barriers in Science, Engineering & Technology" http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTGENDER/0,,contentMDK:20208058~menuPK:489311~pagePK:148956~piPK:216618~theSitePK:336868,00.html.

[3] "Science Career for Indian Women: An examination of Indian women's access to and retention in scientific careers"

[4] http://insaindia.org/executive.htm

[5] Klasen, S. 1999. "Does Gender Inequality Reduce Growth and Development? Evidence from Cross-Country Regressions"

means "women have less influence on society than men do, because controlling technology means having the power and an influence on decision-making."[6]

The Report on 55th Session of the Commission for the Status of Women (CSW) acknowledges that inadequate and low-quality education reduces the benefits of education & training for girls and boys. Further, there is a "widespread underrepresentation of women and girls in many fields of science and technology (that) represents a loss of talent and perspectives, hinders economic development and women's economic empowerment and can contribute to the gender pay gap"[7].

Some initiatives

In 1994, at the Fourth World Conference on Women, the Beijing Platform for Action included a call for action to increase girls' and women's access to and retention in S&T, including by adapting curricula and teaching materials with the view to "establishing gender equity in Science & Technology education, removing obstacles to women in scientific and technological careers (and) making science responsive to the gender dimension"[8]. Many countries around the world have taken initiatives to promote the participation of women and girls in science and technology education. These include developed countries like the USA, the Netherlands, Sweden and Australia, as well as countries like Mexico, Turkey, and Zambia. In India, a few industries are beginning to acknowledge the issue of the "glass ceiling" for women that puts limitations on the career-related development of working women and they are taking proactive steps to minimise them. As part of its celebrations on the occasion of International Women's Day 2011, the Indian Space Research Organization held a National Conference for ISRO Women, where remarkably, there were thematic discussions around equal rights, opportunities and access of women; their decision-making; leadership and empowerment of rural women. Though it is unclear what the outcomes of the conference were, this seems to be a step in the right direction. The Information Technology sector has been proactively trying to grow and retain its female workforce with various initiatives being taken at Infosys, Accenture, Yahoo and General Electric (GE).

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[6]Ribu, K. 2006. "Retaining Women in Engineering Education Through Network Groups and Mentoring"

[7] Agreed conclusions on access and participation of womena dn girls in education, training and science and technology, including for the promotion of women's equal access to full employment and decent work, point 18. http://www.un.org/womenwatch/daw/csw/csw55/agreed_conclusions/AC_CSW55_E.pdf

[8] UNESCO. 2007. "Science, Technology and Gender – An International Report"

But by and large, in India, the role of technology is not recognised by either the larger society or the women's movements as significant for gender equity in the society, and as a duplicator of existing gender inequities. Even in case when a discussion on gender and technology occurs, it is restricted to the IT sector, and does not usually include the debates around S&T.

Situating the Gender and Technology question in India

While the discourse on gender and technology in its various permutations and shades – gender in technology, technology in gender, gendered technology – has gained ground all over the world, in India the issue is yet to be heard at public fora. Similarly, regarding the professions themselves, there is a perception of the gender gap closing in terms of numbers. This is especially so with the rise of Information Technology powered Business Process Outsourcing or call-centres as the flagship for the technology sector. However, unpacking these numbers shows that the IT industry has 25-30% women in its workforce, of which less than 10% make it to the middle management, and even lesser go to the top.[9] One can extrapolate from the figures for the so-called women-friendly IT industry that in other fields too, women will be concentrated in the lesser paid/ prestige positions, with very little representation in positions of decision-making.

We at FAT believe that the low participation of women in the creation of technology is not representative of the potential of women, but is caused by a multiplicity of factors that affect choices during education and in the profession. Based on our understanding of these factors, we have identified four main problem areas as our field of work for the next ten years. They are:

A) The first problem area is the low participation of women in the creation of technology: This can be further narrowed to:

   a. The low uptake of STEM subjects by adolescent school girls, which may be due to socially constructed choices or due to challenges they face in getting access to STEM education.
   b. The low uptake of tertiary education in technology among girls,
   c. The Leaky Pipeline phenomenon among those who study technology and join the profession, and
   d. The stagnation of women professionals in lower-paid low-prestige positions.

[9] http://www.livemint.com/2007/11/05005400/Women-at-work--Women-are-IT.html

B) The second major problem area is the absence of gender and technology from the movement for women's rights and the development discourse. While the instrumentality of ICT (Information Communication Technology) for empowerment has been recognized by women's organizations in the past decade, and while the issue of the larger gendered division of labour has been a mainstream concern, women's participation in decision-making around technology is yet to be put on the agenda of the Indian feminist movement.

C) In trying to locate the issue of women and technology in India, one encounters another problem – that of the lack of documentation and studies done on the subject of gender and technology. There is a scarcity of data and information right from the proportion of girls studying in technology institutes, to the attrition rates of women technologists from their chosen professions.

D) Another major concern is the unequal access to technology usage. Women on the wrong side of various divides of economic and social class, rural-urban locations, face different kinds of challenges in getting access to simple and the most common forms of technical tools/devices. Although ICTs are now considered not just a necessity for communication and expression but also an important tool for emancipation of several disadvantaged groups, a significant number of women still find themselves unable to access or use these technologies.

Against the background of this understanding of the 'women, gender and technology' question, FAT proposes a three-year action plan that consists of

a) School Intervention Program
b) We Women in Technology/WeWIT Initiative
c) Research, Documentation and Communication
d) The Tech Centre Project
e) Advocacy Initiative

School Intervention Program

Rationale and Problem Statement

We at FAT believe that the low participation of women in technology making is not representative of the potential of women, but is caused by a multiplicity of factors that affect choices during education and in the profession. We also believe that if we uncover and understand the various channels of negative feedback regarding STEM studies that schoolgirls receive, it is possible to counter these stimuli.

A review of the available literature on women in technology suggests that the three main reasons for the shortage of women in technology-design and decision-making are:

a) The low uptake of tertiary education in technology among girls, and earlier still, to the self-elimination of girls from STEM subjects at the school level itself.

b) Those that do pursue tertiary education in technology, and join the profession may drop out early.

c) Among those who stay in the profession, many do not experience a good growth graph.

Concerning the first issue of self-elimination of girls from STEM fields in school, it has been noted that while "academic performance of boys and girls is moving toward convergence, but notions still remain about fields of study and occupations that result in their clustering by gender."[10]

This can be attributed to two main causes: one is of course the larger societal environment which lays down the norms of gendered roles and expectations. The other, perhaps not as evident but as powerful, is the systematic discouragement of girl children entrenched in the very nature of the schooling system. Anecdotally, one can further trace this to the design of the curriculum, and the inequitable access of girl children to the classroom and the laboratory.

The Project

Through the Adolescent Schoolgirls Program, FAT proposes to address this second concern of the role of the school in discouraging girl children from pursuing tertiary education in STEM subjects.

[10] Stromquist, (2007)The Gender Socialization Process in Schools: A Cross-National Comparison, 2007.

Goal

The goal of the School Intervention Program is: To reduce the bias at school level against the participation of girl children in science and technology education and to ensure that the choice to undertake STEM studies be made without structural inequalities.

Objective

To sensitize students, teachers and decision-makers in school of the underlying gender biases determining the performance of girl children in science and technology education; and to explore means to reduce these biases within the school together.

Target

We intend to pilot the program with approximately 500 middle-school girls studying in lower-middle income to low-income schools in Delhi municipality area, the rationale being that girls in this socio-economic category face larger obstacles in pursuing STEM subjects than girls in upper-middle income and higher income groups.

We intend to work with not only the girls themselves but also their science/maths/computer teachers, the school administrators, the lab assistants etc., who form the ecosystem for learning science and technology in school, and the male students who are active agents who affect the learning environment of the classroom and the laboratory.

Strategy

In course of this pilot project, we will work with a group of 500 girls who are studying in class VI at the start of the project. This means that at the end of the project, the target group will be in class IX. This group profile allows for a reasonable time frame to interventions and to gauge the impact of our interventions, as by the time school children are in Class IX, they have made up their mind about which stream – science or humanities – they would take up at higher secondary level.

While the first year will be devoted to understanding the nature of the problem and its underlying causes, and designing means to target the various causes, and testing them, the next two years will be focused entirely on working closely with the girls and their teachers at breaking down biases and fears of science, technology and mathematics, through extensive interventions such as workshops on gender and leadership, showcasing role models in science and technology, through field trips etc.

Sub-Objectives and Corresponding Activities

Target	Sub-objectives	Main Activities
Teachers, administrators and lab assistants	To sensitize them to their underlying attitudes and practices which affect the choices of school girls	Problem Identification Knowledge, Attitudes and Practices gaps
		Plan of Intervention design of appropriate means to address these gaps
		Execution of the activities
Female Students	To assist girls in overcoming the negative structural messages against taking up STEM education	Problem Identification - Identification of obstacles for girls within the structure of the school to learning and pursuing science and technology
		Plan of Intervention Design of appropriate tools and activities to address these obstacles,
		Execution of activities for sensitization
Male students	To sensitize them to gender concerns in order to create a positive classroom environment for girl children	General Gender sensitization workshops

1. **Identification of Target Schools.** FAT has created a list of about 40 schools within a 5 kilometer radius of the south Delhi area of Lajpat Nagar on the basis of the administration of the schools (whether run by the government or not) and the socio-economic class of students they cater to. In the next few months, we will further filter the number to 20 on the basis of the academic standards and performance of students in general. The Knowledge, Attitudes and

practices Survey for teachers and school administrators, and the Baseline survey on attitude of schoolgirls to STEM subjects will be conducted in these schools. Finally, as mentioned above, based on the receptivity of the administrators and teachers, we will shortlist about 10 schools to partner with for the project. The number is being proposed on the assumption that there are approximately 50 girls in an average class.

2. **Report on Knowledge, Attitudes and Practices (KAP) Survey among Science teachers and school administrators.** The first activity of this project will be a Knowledge, Attitudes and Practices Survey to be conducted in a sample selected from a pool of approximately 40 schools that have been identified as potential schools for intervention. This survey will be conducted in order to understand the critical gaps in how teachers teach science and technology in the classroom, and how this can alienate or discourage girls from these subjects.

   We realize that for the success of an intervention like this, we need the collaboration and cooperation of teachers and the administrators. So, during the KAP survey, we will also evaluate the receptivity of the administrators and teachers to such a project, and filter the schools on the basis of this.

   The findings of the KAP survey will be published for wider sharing in the policy circles as well as other organizations working on similar issues.

3. **Planning and design of Interventions with Teachers and Administrators.** On the basis of the findings of the KAP survey, interventions will be designed for teachers and administrators. The interventions will primarily follow the workshop format, in addition to creation of a support group for teachers where they can share experiences and exchange information. Since this is a very specialized field of expertise, a consultant with background in science pedagogies and gender training will be hired for this purpose. An important factor that influences the choices of girl children in academics is the parental attitude. At this point, FAT does not intend to work with parents directly. However, we will try to include them in the ambit of change through teachers. Our interventions with teachers will include training to work with parents.
   The final results of this activity will be published for wider circulation among other stakeholders, such as the policymakers, educationists, NGOs etc. Under this, handbooks for teachers will also be produced.

4. **Execution of Planned Interventions for teachers.** The purpose of these interventions will be to sensitize the target group to issues of gender bias in STEM education, to be aware of how these biases can affect their teaching methods, and how this in turn can alienate one gender from the study of STEM subjects. Further, the interventions will try and provide the teachers and administrators with the tools to overcome their biases and alter their classroom practices. Specialist trainers will be hired as consultants for the workshops for teachers, while regular contacts will be maintained by the Project Coordinator and Associates. Wherever needed, new methods will be tested with a few teachers before being launched for the entire target group.

5. **Baseline survey on attitude of adolescent girls towards STEM subjects.** This survey will be conducted by FAT in the same schools as where the above-mentioned KAP survey will be conducted. The purpose of the baseline is to understand the extent to which schoolgirls self-eliminate from STEM studies. To this end, both female and male students in Class X will be interviewed with regard to their preference of stream for higher studies. The male students will provide the control group - without gender bias, how many in a population choose to study STEM subjects at a higher secondary level. Besides giving us evidence on the phenomenon, this data will also form a benchmark for evaluating the outcome of the project at the end of the three years.

6. **Study of the causes of low interest of girls in STEM subjects.** The objective of this study will be to explore and analyze the large variety of causes that impact the choices of schoolgirls on whether to take up STEM studies or not. A special focus will be on how and to what extent the classroom pedagogy and the ‘structure’ of the school may affect interest in STEM subjects. This study will be ethnographic in nature, and will be undertaken by a consultant sociologist. The design of the study will be left to the sociologist.

7. **Planning and design of Interventions with the Schoolgirls.** In consultation with the teachers, a range of activities will be designed to counter the negative feedback received by the girls regarding their abilities in the classroom, and to enthuse them towards STEM subjects. Some examples are – workshops on gender and leadership, field trips to meet women professionals at work, talks by role-models, science fairs for girls where they can exhibit and talk about their science projects. In addition, regular counseling services will be made available for girls. Wherever needed, new methods will be tested with a small group of girls before being launched for the entire target group.

It must be pointed out that the design of interventions will be informed very much by the experiences and feedbacks of the schoolgirls themselves.

8. **Execution of the Planned Interventions for girl children.** This chunk of activities forms the backbone of the pilot project. The objective is to establish regular contact with the children and create a bond of trust with them so that they can talk about their ambitions and fears comfortably, and to enable them to recognize that bias against women in science and technology can be overcome. The activities such as field trips and science fairs are not meant to substitute their curriculum, but only as a supplement to the classroom activities. Most of these activities will be handled by the Project Coordinator and the Associates. Specialists will be consulted as and when needed.
9. **Gender sensitization workshops for boys.** We recognize that male schoolchildren and their attitudes to their female counterparts form an integral part of the learning environment. Keeping the fact in mind that the average male child in our target schools comes from an environment steeped in patriarchal values, we propose to conduct gender sensitization workshops with the schoolboys also.
10. **Monitoring and evaluation reports.** Yearly monitoring will be conducted to assess the progress and direction of the project. At the end of the project, an external evaluator will be consulted to judge the outputs and outcomes of the project, and the possibility of using it as a model for upscaling to other schools in Delhi and other cities and regions.

Risks, Constraints and Mitigations

1. The nature of this project necessitates that for certain components such as the KAP survey of teachers and the Study of the causes of low interest of girls in STEM subjects, complex skill sets are required. At present, while FAT has some gender experts on its staff roll, it does not have in-house educationists, workshop designers, communicators etc. However, we have a good relationship with organizations that have complementary agendas and experience. The specialized human resource needs will be included in the budget as hired consultancy costs. Further, FAT is in the process of constituting an advisory board of experts in the field of science education, and gender issues in the classroom, which will provide guidance to the Programmatic staff through the course of the program.

2. There are a number of reasons why schoolchildren, both boys and girls, may be discouraged from pursuing STEM education. For instance, the delivery of primary education may have been so poor that the children do not have the conceptual foundation to get admission to secondary level STEM classes. We shall address this risk by careful selection of schools wherein we will try and identify those that have adequate primary and secondary school education. We shall measure these by the pass percentage of students at the All India Secondary School Examination (AISSE) and All India Senior School Certificate Examination (AISSCE) level, and also the average performance of students in these exams. Besides, we shall target co-educational schools, in order to have a control group in the way of boys. However, we are amenable to working with all-girls' schools too.
3. The feedback received from organizations who work with schools is that it is difficult to obtain the participation of government-run schools because of the convoluted bureaucratic procedures. Therefore, during this project, we will try to work with government aided schools rather than with government-run schools, as at the stage, we would like to concentrate our limited resources on testing the pilot interventions, and not struggle with bureaucracy. Similarly, the success of the project can be endangered by the unhelpful and rigid attitude of teachers. To minimize this risk, we will select the final target schools after assessing their willingness to be part of the experiments. Besides, we will invest in senior-level trainers who have extensive experience of working with educationists.
4. In the course of a three-year project, it is possible that the teachers of science, technology and computers may not remain the same from one class to the next. As far as possible, we will try and advocate with the school administrations to allow the same teacher to teach the target group. Also, we will try and involve other science teachers in the teacher-oriented workshops so that even if there is a change of teachers from one class to the next, the project outcomes do not slide back too far in the transition.
5. Although we will also work closely with organizations that work on promotion of science education, at this point, we do not intend to make an in-depth critique the curriculum. Our interventions will assist the schoolgirls in interrogating the social constructs of gender-appropriateness of science and technology and to help them break them down.

Impact Assessment

The two main indicators of the impact of this project will be:

1. **A significant shift in the knowledge, attitudes and practices of the science and technology teachers, and the school administrators -**The KAP survey undertaken at the beginning of the project will provide the baseline data. Apart from the end-of-the-project evaluation, routine self-assessments will be done by the teachers themselves, and evaluations will be done before and after workshops etc.
2. **A significant increase in the number of schoolgirls taking up Science Stream after Class Xth.** The 'survey on attitude of adolescent girls towards STEM subjects' conducted at the beginning of the project will provide the baseline data against which the assessment will be made after the final year of the project. During the course of the project, regular assessments will also be undertaken by the project staff to monitor shifts in the attitudes of the schoolgirls towards STEM subjects.

Sustainability

FAT looks at this project as a pilot from which the learning can be scaled up to reach out to many more schools. If significant improvements are found in the enrolment numbers of girls in higher secondary science streams, we would aim to work with other organizations that work in the education, to launch this in other regions and schools.

Further, the both the baseline findings and the evaluation results will be widely disseminated in the policy circles and among other NGOs for advocacy purposes.

We Women in Technology (WeWIT) Initiative

Rationale and Problem Statement

We at FAT believe that the low participation of women in technology creation is not representative of the potential of women as occasional arguments regarding 'innate abilities' suggest, but is caused by a multiplicity of factors that affect choices during education and in the profession.

The reasons in specific can be narrowed down to:

a) The low uptake of tertiary education in technology among girls, and earlier still, to the self-elimination of girls from STEM subjects at the school level itself.

b) Those that do pursue tertiary education in technology, and join the profession may drop out early.

c) Among those who stay in the profession, many do not experience a good growth graph.

Worldwide, many investigations have been carried out to understand the reasons for the low entry and retention rates of women workers in engineering professions, and why the growth curve for women professionals tend to plateau out earlier than men. At the macro-level there are reasons ranging from gender stereotypes about professions and cultural environments, to gender bias in hiring and promotion, to women's disproportionate domestic and care work[11]. At the micro level which is substantiated by anecdotal evidence, the main causes of lower entry and retention of women into technological professions seems to be because of:

a) Lack of role models

b) Lack of network and buddies compounded by the Imposter Syndrome

c) Lack of mentoring within the profession or the organization, someone watching out for them, helping them map their career path[12]

d) Lack of information regarding career and academic opportunities

An oft-quoted factor regarding the problem of low numbers of women in technology is - the lack of role-models for young women in technology and the persistence of the stereotype that

[11] Schriebinger,L. (2010), Gender, Science and Technology.

[12] http://www.businessweek.com/smallbiz/content/mar2006/sb20060314_760860.htm

'technology is not for girls'. On the other hand, many women have made tremendous contributions to the field of science and technology, and these are not highlighted widely.

Due to the perception of certain technical fields as being 'masculine' and the existence of 'macho' cultures, women find themselves isolated at the workplace. On the one hand this may make it difficult for them to find 'work-buddies' with whom they can discuss professional issues, on the other, they may miss out on networking opportunities that are essential for career growth.

Further women are more likely than men to suffer from the 'Impostor Syndrome' wherein the person feels that her success is undeserved or that her talent is not an inherent ability but a mere result of repetitive hard work. A predominantly male work-place can negatively reinforce this feeling.

Whereas it has been verified that mentorship in education or in the profession is an informal but extremely effective way of finding relevant information regarding growth opportunities, and young men are beneficiaries of mentorship from older men, many young women professionals suffer from the lack of mentors within the organization or even the profession. This could primarily be because of the lesser number of women to begin with.

While there are a number of scholarships or research fellowships that are targeted primarily at women, they fail to make use of these opportunities because of lack of information.

The Project

Goal of the Project

It is one of FAT's goals to promote the retention of women in technical professions, and to assist them to grow to their full potential in their careers. We acknowledge that there is no single solution for a problem as complex as this one, and especially so because of the variety of causal factors. We therefore plan to start at the micro-level, and explore for solutions to only some of the problems at the workplace.

Objective

With this in mind, it is being proposed to create a multi-pronged support system for women professionals in the various fields of science and technology.

Target

This project will be primarily targeted at new and mid-career women professionals in various technological professions. Girls in tertiary education can also be part of this network and benefit from it.

Strategy

Sub-Objective	Intervention
To create an online database of women achievers in technology	In order to address both which? these issues, the documentation of the achievements of women technologists will be carried out, and an online database of 'Role-models' will be created. Highlighting these women will break the stereotype that women cannot be technology-innovators; this is for younger women.
To create an online community of women in technology.	A social networking site dedicated to women technologists will try to address this gap by providing a safe place where women technologists can discuss matters related to technology, work, (or gender bias at work, whatever concerns them), find camaraderie and solidarity with women facing similar challenges at work.
To start a mentorship program for young women technologists.	We intend to offer the members of the social network the opportunity to seek mentorship from better-experienced members. This will be done by integrating the social network database with the 'rolemodels' database. Successful women featured as 'role-models' in various fields can volunteer to provide mentorship to younger colleagues.
To facilitate access to opportunities through an online resource library/centre relevant for women technologists.	By aggregating relevant information for women technologists at one spot, we intend to create a one-stop shop for information about opportunities in education and profession.

Main Activities and Deliverables

The main output of this project will be:

1) A web portal with four main features of
2) A database of role models in technical fields
3) A social networking site for technical women

4) An advanced search feature p for the mentorship program.
5) An information centre for career opportunities.

Database of role models.

This database will have two main parts – a database of women in the history of technology worldwide, and a database of women innovators in the field of technology or 'techno-vators' in India in the present time.

The purpose of the first database is to collate and highlight any and all information on women's contribution to the field of technology. The research for this database will be primarily done through desk research.

The second database of techno-vators in India will provide information on innovators in three categories – 1) the formal sector of research and development where women technologists have created innovations as part of their work, 2) the informal sector where rural or urban women innovate out of necessity, and 3) the education segment where young girls in school and in technical institutes may have created innovative academic projects.

Three methods of data collection will be used. The first will be through traditional desk research. Secondly, for information on current techno-vators, publicized calls for information will have to be launched, as many of the women techno-vators are not likely to be well-documented in print or otherwise, and will be known only by colleagues, beneficiaries of the innovation and/or local journalists. Further, our experience from the previous WeWIT call for information shows that for a high response rate, it is necessary to build in an incentive structure. For this, FAT intends to launch an annual recognition for Women Techno-vators of the Year. The third method will be to tap into non-professional networks, resources such as Eklavya, People's Science Institute and CSE and Research and Development Organizations.

A social networking site for technical women.

In order for people to sign up AND come back again and again to the website, firstly it will be user-friendly and intuitive in its design. They will be able to create forums for public discussions, and administer the forums themselves. Also, the site will be designed with search features with which women can seek 'buddies' or create 'groups' specific to their professional interests. Secondly, the success of this networking site will depend on both the number of members and also on how actively they use the site. For this, during the project period, regular membership drives will be conducted among women professionals as well as technology students. A

communications manager will be responsible for creating a 'buzz' on the networking site. Further, since there are many other social and professional networks in the market, the communications manager will also be responsible for marketing this website as a new and attractive product.

Thirdly, in order to minimize the chances of trolls online, a verification process will be put in place whereby members' details can be confirmed.

The Mentorship feature.

The mentorship feature will combine the two sections of the database of women techno-vators in India and the social network of professional women. On the one hand, women featured as techno-vators will be requested to sign up as mentors. They can choose to offer mentorship only online or in person as well. Further the mentorship can be in the form of career guidance, help in business development, providing research guidance, or in other form. On the other, at registration on the website, members will be offered the choice of registering as mentees. Refined search options will be enabled through which mentees can search for potential mentors as per field of expertise, and degree of mentorship and establish contact via private messaging.

An information centre for career opportunities.

The fourth section of the portal will be an aggregated feed of information relevant for women professionals and students – such as regarding scholarships for female students, research grants, study fellowships, internships and career opportunities. A significant activity towards this would be to build a network with various institutions and organizations who can regularly share relevant information.

While the online portal is the visible output of the project, the intangible output is going to be the extensive support system that women techies are going to gain in the form of a social network. FAT will make use of the information and the network generated to enrich its other programs. For instance, the database of women achievers can be used for dissemination as role models in the School Intervention Program. Similarly, the database of mentors in one can be tapped for bringing in speakers for the other.

Risks and Mitigation

Since the first WeWIT website was launched in 2009, with some of the features mentioned above in a rudimentary fashion, we have had the opportunity to make mistakes, and based on the experience, we have recognized that there are risks.

First, for the success of data collection for Women Techno-vators, a widespread and visible campaign will be needed. Not only that, a reward structure will have to be built into the campaign in order to make it attractive for people to send in information.

Second, the true potential and scope lies in the diversity and quantity of the membership, and this in turn will predict the quality of interactions on the network. For this, the final social networking website should be attractive and must offer value so that the target audience should want to be part of it, and not simply sign up out of a sense of duty. If people sign up for the network only for the 'cause', the network will not come 'alive' in the manner that a successful social networking website should.

Impact Assessment

The main indicators of the success of this project will be the pool of membership to the networking site, and the daily/monthly web traffic, and the number of successful mentoring matches. The benchmarks for success will be decided upon with respect to the size of the target demographic. Further, for features such as information database and mentorship, 'customer satisfaction' will also be taken into account.

Sustainability

We intend to let the website become a self-sustained entity, with minimal intervention from FAT, through a pool of volunteer administrators and moderators. Before the end of the three years, a not-for-profit revenue model will be designed based on nominal membership charges to cover the annually recurring web hosting and domain registration charges. After the end of this phase, the next phase of the campaign will attempt to translate the network into city-based offline support groups. At a future date, we would like to expand our campaign to address issues of gender stereotyping and of the women's 'dual burden' of home and work, of policy matters such as hiring and retention policies.

The Tech Centre Project

Rationale and Problem Statement

Today, we are witnessing a tremendous penetration of technology into our lives. Information and Communication Technology is perhaps the most visible face of this, but other technologies are equally pervasive – be they reproductive, health-related, or are simply time-saving devices. As production techniques and services get more automated, knowledge of technologies opens up new avenues of livelihoods. Also, the pervasive nature of technologies necessitates that those who control technology, have more power and an influence on decision-making inside the house and in the society.[13]

In spite of this, many young girls from underprivileged backgrounds do not get the opportunity to explore technologies or use them due to prevailing societal norms of femininity/ masculinity, and gendered division of labour. This narrows down the range of livelihood options for them to low-paid unskilled work, while males from the same economic backgrounds can access better-paid skilled work. Further, excluding technology from their lives also puts them at a disadvantage in terms of influence in the society.

The Project

At FAT, we believe that technical education will give young girls more confidence in their abilities and enhance their leadership skills. Enhanced technical skills coupled with some professional skills will also empower the girls to seek better livelihood options, thus improving their standard of living as well as their knowledge of their own rights and abilities.

With the goal to empower economically and socially young women from underprivileged background, the FAT Tech Centre was started in July 2010. In this center trainings are conducted on computer skills, Internet skills, and audio-visual media skills. Since the inception of this program, 26 girls from the Lajpat Nagar slum have taken part in the program in the first batch. The current batch of 10 girls is currently participating in the program. FAT intends to continue with the Tech Centre for as long as needed.

The three main objectives of the creating the Tech Centre are:

[13] Ribu, K. (2006) Retaining Women in Engineering Education Through Network Groups and Mentoring

1. To create a safe space for girls to explore and learn technologies,
2. To enable them to interrogate their social realities during the process of learning, and to build self-reliance and self-confidence; and
3. To impart a set of professional and market-oriented skills that will open up livelihood opportunities.

Target

The Tech Centre is aimed at girls in the age group 17-25 from underprivileged background. At present, we are working with the community in the Lajpat Nagar slums. However, girls from other parts of the city have also evinced interest in our program. In light of this, we will try to open the center to any interested girl. This group usually finds their life choices circumscribed by the family expectations to adhere to traditional roles. Secondly, as the family has limited resources to invest into education of children, preference is given to the males over their sisters.

The Activities

The Tech Centre will focus on providing two main resources:

1) Training in technical skills, and 2) Counseling and handholding.

Training in Technical skills

This component will further have two distinct aims and structures, which are described below:

1) ***General course on ICT Interactions and Self-exploration***

This program is currently being run at the Tech Centre. It is a six-month long program based on a series of workshops – every month, girls undergo a 10 day workshop on new skill, after which they practice the skill for the rest of the month and prepare a project based on the new skill. The projects given to them are usually thought out to trigger discussions and questioning around social issues and self awareness. This not only helps them practise their newly acquired skills, but also challenges them to think out of the box to complete the tasks they are given. This results in holistic development of professional skills and social conciousness.

The current format is

- Month 1: Basic Computer/Internet skills
- Month 2: English written and conversation skills

- Month 3: Still Camera, photo editing, storytelling using photos
- Month 4: Internet advanced – Email, blogging, social network, security, expressing through media
- Month 5: Video shooting and editing skills
- Month 6: Advanced English conversation skills, career planning.

Besides these workshops, there are regular group discussions, educational trips within the city, dance and drama classes to improve self-expression, and comfort with their bodies.

The intake will not be more than 15 girls per batch. So the annual turnover is about 30 girls.

2) ***Specialized course on specific skills***

This course will be geared to prepare young women for employment. This is targeted at the segment of our target group which has been educated to at least up till class X, but is unable to seek employment for a variety of reasons or is now stuck in a low-skill, low paying job like domestic work.

The selection of skills that we will take up for training will be decided upon after an extensive survey of the market. But, they will be primarily technology-related, such as mobile phone repairing, electrical wiring, electronics appliance repairing etc.

The duration of the training will be specific to the requirements of the girls and the degree of complexity of the skill. Based on the preliminary survey, it is being proposed that the frequency of the specialized course would be 1 every quarter. Besides the technical skills, they will also undergo modules on life skills such as Conversation skills, Interpersonal skills, Business ideas, and Managing money.

The intake of girls would be about 15 per batch, in order to ensure quality instructor-trainee ratio. The yearly turnover will be about 60 girls.

Counseling and Handholding

Counseling and Handholding will be a regular ongoing feature of the Tech Centre.

a. Counseling

The counseling is meant to help the girls negotiate the difficult choices that they face because of their gender and social class. The reality of an average girl in our target group is complex. On the one hand, up till adolescence, she goes to school and is expected to do well academically.

On the other, this education is only for its own sake, as parents look upon further education as an unnecessary financial investment with no security of returns as employment. Also, since the marriage of a girl is still perceived as the final responsibility of her parents, they think it more prudent to marry her off at the earliest possible instant. Further, in their own communities, these girls are extremely vulnerable to sexual harassment due to the prevailing patriarchal values and lack of respect for women's mobility and freedom.

We have found that counseling becomes an important means of helping the girls negotiate with their families, and to deal with sexual harassment in an appropriate manner. In addition to counseling the girls, often our staff has had to intensively engage with the families also.

b. Handholding

One of the lessons we have learnt from our early successes is that although the duration of the training may be short, it takes much longer for the girls to find their own feet, and if handholding is not provided during this period, they often slide back, i.e. they may be married off, or are unable to use their newly acquired skills in a job. To avoid this slide, we will provide a longer-term handholding which among other things will also provide career guidance. Broadly, the career/placement counselor will be responsible for finding suitable positions for the trainees. The counselor will also guide those who do not have sufficient education to get a job but do possess the technical skills on how to set up their own small business if they wish to do so.

Outcomes and Impacts

While the other two programs – the Adolescent Schoolgirls Program and the We Women in Technology Program – are targeted at including women in technology-creation, the Tech Centre focuses on promoting technology usage to empower the women towards enhancing livelihood opportunities and the quality of their lives. In terms of its outreach, it touches a comparatively smaller number of lives, but on the other hand, the impact is more immediate and also tangible. The success of this program will be measured by the confidence, social awareness, leadership development among the girls, and their financial independence.

Risk and Mitigation

FAT does not have previous experience in carrying out a livelihoods project. Therefore, for the Handholding component (livelihoods component), a person with at least 5-10 years of experience in livelihoods generation field will be taken on board.

Sustainability

We intend this series of trainings to be a long-term project which can be scaled up to reach out to many more girls in Delhi and other places. Through the success of this center, in the long-term, we hope to shift the attitudes and stereotypes against women and technology.

Research, Documentation and Communication

Problem Statement

In India too, the participation of women in technological professions is significantly low. In isolated cases or in the odd industry, cognizance is being taken on the issue of the 'glass ceiling' for women. For instance, the Indian National Science Academy had published a report on 'Science Career for Indian Women: An examination of Indian women's access to and retention in scientific careers'. The Indian Space Research Organization held a National Conference for ISRO Women in 2011. The Information Technology sector for one has been proactively trying to grow and retain its female workforce with companies through initiatives like Women's Inclusivity Network at Infosys, Vahini (a networking forum for women) at Accenture, Yahoo! Women in Tech Initiative. General Electric (GE) has even started a track to bring back women professionals who had dropped out of their jobs to raise families.

But by and large, in India, the role of technology has not entered the mainstream discourse. The women's rights movement also has so far not examined the issue as significant for gender equity in the society, and as a duplicator of existing gender inequity. Even in case when a discussion on gender and technology occurs, it is restricted to the Information Technology sector.

In May 2011, Feminist Approach to Technology (FAT) conducted an online survey among development professionals – a demographic which can be expected to be educated on such matters. Out of 60 responses received, more than 75% were not aware of the links between gender, technology and development. However more than 85% felt that participation of women in S&T should be one of the goals of the women's movement in India.

Importantly, even if one wished to advocate women's equal access and choice in technology creation and use, and wished to gain the support of other organizations, the media and the policy makers to achieve this there is a paucity of data and information which is critical for an educated and informed dialogue.

Goal

With this in mind, the Feminist Approach to Technology proposes to undertake a Research, Documentation and Communication program, with the larger goal of creating a country-wide

dialogue and consensus on the need for women's participation in technology-creation and equity in technology use.

The Research and Documentation will be undertaken under three main themes:

- The relationship between Women and Technology in the context of India and its implications for society,
- The causes for the current low status of women as makers and users of technology, and
- The contribution of women to the field of technology.

The relationship between Women and Technology in the context of India and its implications for the society

Under this head, we will attempt to establish the case for bringing in the creation and usage of Technology into the gender discourse, and vice versa.

How wide is the gender gap in technology education, technical work and technology usage?

Does this gender gap have negative consequences for the society at large? In addition, should the women's movements and the larger society be concerned about the gender gap?

The causes for the current low status of women as makers and users of technology.

Keeping in mind that the usage and creation of technology are distinct and the low status of women's participation in the two may have different causes, they will be studied separately. Women's engagement in technology creation will be examined across all the stages – from adolescent girls learning STEM subjects in school, to young women in technical institutes, to mid-career professionals in technical fields, to women's leadership in technical fields. Technology usage will be studied across the cross-section of the society – across the geographical, class-based as well as rural-urban divides.

The findings of this section will give the direction regarding the interventions needed in order to close the gender gap.

The contribution of women to the field of technology so far.

We are concerned that on the one hand the achievements of women technologists are not better-known, on the other, girls and young women suffer from the apparent lack of role-models. In order to rectify this, we will undertake a wide documentation of the contribution of women to technology. This will be done both as a historical documentation, and also to create a pool of

role-models and success stories. We will look for stories of women achievers in the organized AND unorganized sectors, and in India and abroad.

Besides, we will also research the works of organizations that have been working on the issue of Women and Technology, and document their best practices.

Research Methodologies

As is apparent, each of the three questions, and the sub-questions under them can be treated as a smaller research project, and therefore in need of its own research design and methodologies. Broadly, we will use a mix of desk research and specific primary data collection. We will be using specialist services from sociologists and educationists.

We are keen to get our work reviewed by NGO peers and also academics at both the research design and findings stages.

Communication

Disseminating the findings of Research and Documentation will be a necessary strategy in order to gain solidarity among the women's organizations and also to take the debate to the wider society. The communication part will be developed as an add-on project.

Note

The research program is a cross-cutting exercise, in the sense that all the other programs have some degree of research built into it.

Advocacy Initiative

In 2007, UNECSO published a report based on a multi-country study that sought to examine the underlying causes of gender disparities in the S&T field. The need for urgency is clearly stated, "Increasing women's involvement, input and access to S&T is essential to reducing poverty, creating job opportunities and increasing agricultural and industrial productivity[14]." In May 2011, Feminist Approach to Technology (FAT) conducted an online survey among development professionals. Out of 60 responses received, more than 75% were not aware of the links between gender, technology and development. However more than 85% felt that participation of women in S&T should be one of the goals of the women's movement in India. Even though this is a small sample size, we cite it here to illustrate how imperative consciousness-raising is, and to emphasise why the solidarity of the women's movement is important at this juncture, in order that the gender and S&T debate be brought centre-stage.

One of FAT's goals is to create a countrywide dialogue and consensus on the need to increase women's participation in technology-making and equal access to technology use. While FAT's networking and advocacy efforts have increased its solidarity with women's groups across the country, there is still a dearth of organisations working to promote women's participation in technology creation. Intensive collaborative efforts are needed to achieve this mission. To this end, FAT would like to start an initiative to build country wide collective concerns and responses to the issue of women and technology. This initiative will host events and collaborative projects aimed at advocating gender equality in technology production and usage as well as gender sensitive technology design.

As of now 2 events have been planned under the advocacy initiative:

- A National Consultation with women's groups on the women's movement & technology
- A National Conference on **'Engendering Technology in India: Looking Back, Surging Forward'** with various stakeholders like NGOs/Civil Society, Corporates, Academia as well as Government.

[14] UNECSO. 2007. Overview. "Science, Technology and Gender: An International Report", p10.

National Consultation with women's groups on the women's movement & technology

Women's organizations are going to be the key partners in the advocacy initiative. This consultation is planned to be held 14th -15th October 2011 in New Delhi with women's organizations in which we plan to build the partnerships with them to co-organize the larger conference planned for 2012.

The objectives of this exploratory Consultation are to:

1. Initiate a dialogue about the relevance of Science & Technology in women's rights struggles.
2. Discuss how this understanding could be incorporated within organisational strategies.
3. Collectively outline the structure of the conference.
4. Build partnerships with the participating organizations to coordinate the conference and implement its outcomes.

Conference on 'Engendering Technology in India: Looking Back, Surging Forward'

The Conference will be tentatively held in the month of October 2012. It will bring together a diverse group of stakeholders such as women's rights activists, academics, policy makers, and representatives of the technology sector, to discuss the relationship of gender and technology with special reference to India.

The main airms and objectives of the conference are:

1) To discuss women's participation in the design of, use of and decision making around technology, and understand the consequences of gender disparities in technology on women as well as society at large.
2) To examine existing policy guidelines around gender and science & technology in India, and to discuss need for change, if necessary.
3) To arrive at key advocacy strategies that will help promote equal participation of women in the fields of science and technology.

4) To encourage a shared commitment to incorporate the ideas that emerge from the conference into organizational strategies.

The participants of this conference will include policymakers, women's rights activists, civil society organisations, academics and educators, the media, and leaders of technical sectors including the Research and Development sector as well as technology industries. There will be keynote talks and panel discussions by experts on various topics related to women and technology, which will be aimed at building the understanding on the issue. There will also be presentations, round table discussions and brainstorming sessions organized under different tracks aimed at deepening understanding and collective decision-making on the strategies to be adopted by all participants. We have decided four tracks as of now (subject to change based on the outcomes of the Consultation planned for October 2011), which are:

1. Technology Education and Gender,
2. Women in Technology Design
3. Science and Technology and Concerns of the Women's Movement
4. Women and Technical Skills Training

Policy frameworks will form an integral part of the discussions of each working group.

After the conference, a bi-lingual (English and Hindi) report on the discussions and recommended strategies will be produced and shared with various stakeholders across the country.

The success of the project will be determined in two ways: assessing the understanding on the issue as developed by participants, and through the outcomes of the discussions in each track. Besides conducting a feedback drive after the conference, we would be asking participating stakeholders to commit to actions collectively arrived at.