

PARENTEdge

March - April 2019

Vol 8 - Issue 5 - ₹100

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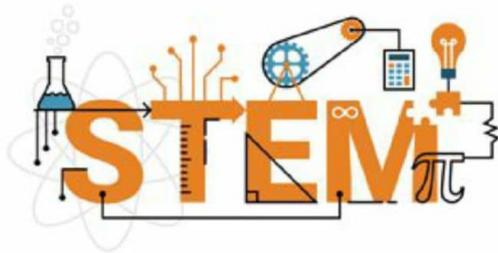
Spotlight



Girls & STEM-

Bridging the Gap





STEM (Science, Technology, Engineering, and Maths) subjects and activities are in vogue. There is immense choice for afterschool activities and summer programmes in robotics, programming and aeromodelling. However, we noticed that many girls are veering away from pursuing pure sciences in school and college and do not show much enthusiasm for STEM activities. This is worrisome, and needs to be addressed. In this article, the causes of this trend, and explore ways and means to tackle it.

STEM subjects and girls – Some shocking statistics

In the pursuit of developing the younger generation into a better workforce, capable of solving societal problems through the use of Science, Technology and Engineering and to compete for greater economic growth in the 21st century, significant importance has been placed on the role of STEM (Science, Technology, Engineering, and Maths) based educational programmes across the globe.

This has resulted in many schools offering STEM-based clubs for students to actively participate and learn, during the school hours and within the school campus. Apart from schools there are organisations that offer various workshops and after school programmes for children to explore and learn about robotics, coding, aeromodelling, -drone building and other such activities. Parents are enthusiastic and keen to support their children in this journey, more so in urban areas, where there is an abundance of such offerings and the financial backing to support such interests.

However it is alarming and at the same time disheartening to see that very few girls opt for these programmes when compared to boys. This trend in turn results in fewer women in the workforce and research in STEM fields. According to UNESCO Institute for Statistics (UIS)'s fact sheet 2018, the average share of female researchers in the STEM fields is only a meagre 28.8% for the entire world.

I recall that there were probably just 20-25 girls in my engineering class out of a total of 90-odd students. Also there were just two lady professors teaching us Mathematics and Logic design while the rest were male.

As per WISE (Women Investing in STEM Equity), even in a developed country such as UK, women made up only 23% of those in core STEM occupations in the year 2017. We can only imagine the dire state of affairs in a country such as ours. Research conducted by Mastercard (2017 Girls in STEM) revealed that 30% of 17-19



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What we can do to bridge the gap

I am sure that we all see the need for us to act as a community to change this perception of what a woman must and must not be. Parents and educators need to make it more conducive for our girls to take up STEM subjects. There are simple steps that parents can take to encourage their daughters to appreciate and take up STEM subjects.

Actions speak more than words. Parents should follow through on their talk, beginning with choosing appropriate toys to play with even at a young age and choosing diverse and challenging programmes to attend for their daughters rather than old stereotypical ones.

Parents can give their daughters adequate practical opportunities to be part of day to day science, as elementary as changing a light bulb or basic troubleshooting of their own computers when they hang. It is very gratifying to be able to fix broken things by oneself. I happen to be the 'go-to handylady' in my home! In fact I take pride in being able to change our car's flat tyre, despite being called a tomboy by my friends.

Parents must encourage questions about the way things work, explain the science behind simple machines or equipment they use in their daily life, probe them to find different ways of solving the same problem.

year old girls in Asia Pacific said that they would not choose STEM jobs despite studying the subject. The reasons cited by them included the fact that there were more men in those fields than women, and that society and media did not do much to encourage girls to opt for STEM.

Reasons why girls are not opting for STEM

According Lynda R. Wies' study it is found that parents' behaviours and attitudes have the utmost influence on the child's STEM performance, participation, and disposition (attitudes, beliefs and feelings). Other key reasons are cultural biases, gender stereotyping, misconceptions about gender abilities in STEM fields, peer pressure to fit in, lack of proper classroom environment which includes availability of proper infrastructure to support STEM education and the teacher's ability to make the subject interesting and easy to understand, and last but not the least lack of role models both at home as well as outside.

Especially in India the societal belief that men are the key bread-winners has resulted in parents' willingness to spend on their son's education as opposed to their daughters'. Also girls participating in household chores is higher when compared to boys in our society. Even if there are

umpteen number of women who have made it to the top and hold successful careers, the roles that women play as care-givers and homemakers are still primary ones, not only in India but across the globe.

The odd thing is that women themselves play the role of discourager. It could be a friendly neighbour or one's own family member who is very critical about a career woman's priorities and the way she cares for her family, her cooking skills, participation in festivities and such.





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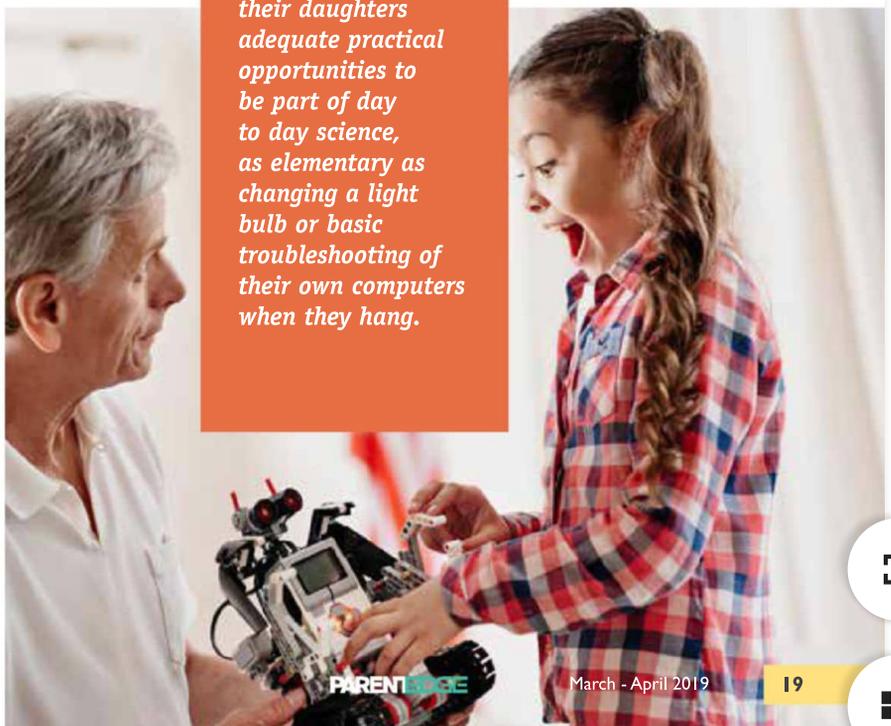
You can make Maths more realistic and engaging by discussing its application and relevance in day to day life such as money required to meet daily needs, family finances, planning vacations. It would be amazing if parents and educators took the time to discuss the wonderful science, math and engineering behind some of the art and craft projects that attracts girls . You could discuss the math behind cooking - quantity of each ingredient necessary for cooking, its cost, duration to cook, process and usage of appliances.

You could narrate the stories behind the invention of everyday appliances such as refrigerators, toasters, blenders and modern day gadgets such as televisions, mobile phones, tablets that girls use day to day.

Parents and educators must actively participate and make STEM an enjoyable and challenging experience starting from a very young age. Take children out on science explorations, jointly build, repair and develop models and conduct experiments using readily available science kits or everyday objects.

Encourage growth mindset, ask them to work at those subjects just like any other subject and assure them that it is possible

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for any one to do well in a subject if they put in enough effort , and that failures are a part and parcel of learning. Provide the necessary support to learn those subjects well. Parents must hold both girls and boys at the same standard when it comes to performance in the STEM subjects and not discriminate between them.

It is best that parents and educators not encourage or engage in any behaviour that supports the misconception that girls are better off studying languages or social sciences or limit their options only to medical or dental fields. Also parents must teach their boys to set aside stereotypical beliefs and work in collaboration with girls

without ostracising them while working on STEM projects at school or at home with their sisters or friends.

Parents and educators must talk to girls about the benefits and opportunities that await them if they opt for STEM subjects and share the stories of women who have been successful in STEM fields.

To sum up

Opting for STEM subjects and activities would enable children to be better prepared for technological innovations enhance their problem-solving skills and their ability to apply the concepts that they learn. They will also learn to collaborate and work in teams. STEM activities and subjects also toughen up the children, encouraging them to persevere and work hard. They learn to follow processes to solve real-life problems, but in a creative and innovative manner . Not to mention the vast number of career choices and the opportunities that open up for them, and the flexibility to seek those opportunities in any part of the world. These benefits should be enough encouragement for parents and educators to promote STEM education among girls and boys alike.

STEM industries are also spending a lot on STEM outreach programmes for girls on a large scale as part of their corporate social responsibility and in the process trying their best to encourage more and more girls to opt for STEM. In return, they are securing their future workforce and hoping to reduce the gender disparity that exists today.

With all the efforts that organisations are making supported by policy makers in the government and the due diligence from parents and educators , we will soon see a better world where men and women are equally contributing to the betterment of the world through the application of the STEM knowledge and skills they have acquired.

- Aruna C

