

From Taking Over Towers to Taking Over STEM

By: Saachi Jain - Team 95070A

There I was, 8 year old Saachi Jain, 4th grade at Foothill Elementary School, sitting in my garage, watching. Watching everything going on around me. My older sister and the rest of her FLL team, fixing their code in a hurry for a competition. I was simply sitting there, watching. I found it astonishing how simple it was to snap together pieces, drag some blocks together and call it “code”, and something magical would happen. The freedom of creating, programming, and then watching the robot complete a task astounded me. I picked up a few of the plastic pieces and connectors, and began playing around. This was the beginning of a journey that I didn’t give much thought about where it would go.

The thought of “Girls in STEM” being mutually exclusive or *not* had never crossed my mind. I would help a teacher fix a Google Docs problem, a printer problem, or fix AirPlay on their iPad in class without thinking too much about it. I always assumed that it was normal, that I was doing something I was truly passionate about, and no one would care. Yes, I was a girl, but helping with these sort of things was normal for me. The notion of girls in STEM not being so common had never occurred to me. That wasn’t until I reached middle school.

During the first week of sixth grade, I heard an announcement over the loudspeaker that registration was open for a “VEX Robotics Club”. *Whatever*, I thought, *I don’t want to join. I’m going to be the only girl out of almost 100 boys*. That evening, my mom urged me to attend the informational lunch meeting. “It will be good for you!” she persuaded. Reluctantly, I went to Room 60 the next day. It was packed with interested students—a sea of boys. *Where are all the girls?* I wondered. And then, I found them. They were all sitting at a table in the absolute back of the classroom, eating their lunches, waiting for the meeting to start. There could have only been 6 or 7 of them. None of them I knew, nor were they my friends at the time. *This is it?* I thought. I registered for the club that day, regardless of the impression that meeting left on me. That year, only 6 out of 120 members, 5%, of the club members were girls.

Registering for the club was the right decision. Us girls all stuck together and formed an all-girls team. All of us were inexperienced, we didn’t even know how to tighten a screw. We helped

each other when building mechanisms we found tutorials for online. Over time, we built a drivetrain as our “robot”. But that wasn’t the important part. The important part was that we all contributed, and we all learned about this program through building this drivetrain. A team of girls had become a group of friends that enjoyed working together. The drivetrains turn out to be worthy, because we ended the season with the Judge’s Award. This was exactly what our team needed. We needed the motivation that this was all worth it, that there were successful outcomes that could come from this, even though we were the only team with girls in our club that year.



In the current season, the club has 12 girls out of 96 members, which is a significant increase from last year. I am on a team with 4 girls, including myself, and 5 boys. When we were deciding our roles, gender had no influence. We simply voted on who we thought was a good fit and had an interest in the role.

I am the Project Manager and Lead Hardware, and I’m a girl. Our Lead Software, Naomi, is a girl. Our Lead Notebook, Sameera is a girl. Naomi is also the driver while I am the coach and the backup driver. These roles were not determined by a person’s gender, but through their personal strengths.

Naomi is a girl with flat out determination. She is dedicated, hard working, and forward thinking. She began robotics when she attended a summer camp set up by our club mentor a couple of years ago. Her love of engineering began there. Naomi then took the STEM elective offered at our school. She learned through experience, simply working on her own and building simple mechanisms last year, and now she is the lead software writer on our team.

Sameera was on the all-girls team with me last year. She has enthusiasm, dedication, and also a fun side to her that make her a valuable contributor to notebook and hardware.

Tina is on our hardware team. She had little experience at the start of the season, but now, she is a strong contributor to our hardware. She likes to build, and writes in the notebook.

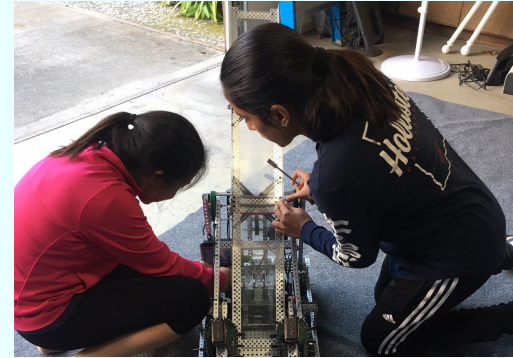
Alex is on our hardware team and does CAD modeling, which he is extremely good at.



Ishaan, Pranav, Kimi, and Kunal are the newest boys on our team this year. This is their first year in robotics, and they are all extremely motivated to improve and grow. Pranav and Kunal do hardware and software, while Ishaan and Kimi help out on the hardware team. They are all learning to write in the notebook. Ishaan is also our secondary coach on the drive team.

Our robot this year is a fully functional traybot. We can consistently stack 7-8 cubes, as well as place cubes in the lowest and middle towers. In one season, we have changed from a team that was simply learning, to a team that is able to build a successful robot and compete.

Our team is proud to have girls in all leadership roles. This is helping change the image and acceptance of girls in all aspects of robotics, not only within our club, but also in attracting more girls to the program. My best friend, who was shy of attending the registration meeting with me in 6th grade, enthusiastically enrolled in the program this year.



Our team is also the most diverse in our club in terms of experience level, talents, and gender diversity. Diversity makes us more powerful because each member specializes and contributes to specific aspects of the robotics challenge making us function as a whole—our mentor/coach calls us “the parts of a well-oiled machine”.

Well, most of the days we are a “well-oiled machine”. It would be a lie to say that there are no challenges or obstacles. However, when I have a bad day or I question my decision to join robotics, the following inspirations remind me that if they had quit, they would not have carved the STEM path for me.



I saw the movie, *Hidden Figures*, when I was in 3rd grade, in 2016. Katherine Johnson’s struggles and triumphs in that movie left a mark on me. I still think about the roadblocks that she faced because of her race, gender, and the field of work she was trying to succeed in. She persevered against the gender and racial roadblocks. She paved the way for me and other girls. Her quote inspires me, “I never have a feeling of inferiority. Never had. I’m as good as anybody, but no better.”

I attended a Women in Robotics Conference at UC Berkeley last fall with my mom and sister. Jasmine Lawrence, a technical program manager at Facebook, talked about Diverse Pathways into STEM and robotics. She inspired me when she said, “You don’t have to start out with an engineering degree, or a robotics degree, to enter the field of STEM or robotics.”

This tells me that there is a place for people with different ideas and different perspectives. Robotics is all about creativity. When you have to design a robot from scratch, diversity of perspective and ideas is crucial towards having a successful design. Such conferences where women in STEM and robotics talk about breaking barriers inspire me to continue to do what interests me, no matter who I am surrounded by, boys or girls.

Lastly, my older sister is also a big inspiration for me. She is the hardware lead on her FTC team in her high school. She is one of the only three girls on her team of 15. I look up to her and get inspired to be better every day.

There we are, one and a half years later, from the time I walked into Room 60 for the first time, not knowing anyone, and debating whether to join. Now I’m on a well-respected, Girl Powered team of future engineers that hopes to change the gender divide in the field of STEM.



CREDITS:

Written by Saachi Jain from Team 95070A