

A Girl's Experience in Botball and Advice to Teachers

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1 Introduction

This year, (2006-2007), has been the authors first time ever to be in robotics. We are in the 6th grade and robotics is a fun and challenging subject. It includes much of today's technology and requires lots of critical thinking, team work, and tons of dedication. In robotics, we have learned to program, build, document etc. To us, it is very interesting and overwhelmingly exciting. But students aren't the only people that have something to do with robotics; teachers have a job in it too. They get the students interested in robotics and when needed, help them accomplish their task. As the years pass, more and more girls become interested and attracted to robotics and join a team. In the future, (because of this "attraction") many more girls will be on a robotics team.

Unfortunately, only about 20% of people with engineering majors are women [1]. The rates are increasing every year though. In 1975, only 2% of all engineers were women. By the year 1995 (20 years later), though, it was up to 17% [2].

1.1 Our Experience

There are many different reasons why someone would join robotics. It could be because that specific person likes the teacher, they enjoy building; they might even just like watching things work and move around with out them manually controlling the robots. Both Kayla and I joined robotics (mostly) because we really liked our teacher's personality and had heard that robotics could be really fun but at the same time a little challenging. Our teacher, Mr. Culp, has an amazing and absolutely wonderful personality. Mr. Culp is a very fun and intriguing teacher. He is always very helpful in every way possible and is not mean at all which makes every thing a whole lot more fun and much, much easier. Also, one of our friends told us that robotics was a lot of fun. Because, we enjoyed it so much, we decided that we would stay in robotics. Since we started, we have learned several different things form several different "categories" in robotics. We also learned that working on robots in teams takes hard work, good teamwork, and lots of time.

1.2 Advice to Teachers

As we said, the personality of a teacher could in many ways effect the amount of people that join

robotics. Teachers that are mean (this does not mean strict) and not very helpful could make the students feel maybe somewhat “uncomfortable” and that kind of personality would also make the students feel as if robotics isn’t that interesting and fun as it really is.

As you can tell most students really enjoy having instructors/teachers that know exactly when to play and when to work so that everything is done the right way and although it is always very challenging, the students are always having fun as well as learning how to do brand new things.

Another characteristic that many students (females especially) would want to notice in the teacher is that they have nothing against the race or sex of the student. These are just a few of the many different characteristics that students would want their teachers to have.

1.3 What Women engineers had to say

We wanted to know more so we decided to go a little further and asked a few real women engineers what they thought about answering some questions. We asked three different women the same 11 question but got all sorts of different answers. The questions are listed below:

1. What was it that made you want to be in engineering?
2. Were you any different from other girls in middle school or high school?
3. How hard did you have to work at math while you were in school?
4. How many females were in your upper level math classes in high school?
5. How many females were in your engineering classes in college?
6. Did you ever feel prejudice as a female in any of your engineering or science classes?
7. Did you have a harder time or easier time trying to get a job since you’re a female engineer?
8. Are you treated differently at work because you’re a female engineer?
9. Do you make the same amount of money as your male engineer co-workers?
10. Did you ever get any awards that kept you motivated?
11. What can teachers do to attract girls to engineering and science and to keep them there?

After about a day or so, we began to get answers from the three. This is what they said:

Engineer #1: Jennifer Ray

1. I am a structural engineer, which I went into in order to understand how a building stands up, and how the pieces of a building are put together.
2. Not that I can think of.
3. I don't remember working terribly hard math. I enjoyed it, so it didn't seem like work. I did struggle with calculus based Physics.
4. I don't remember, but I would guess my classes were probably pretty even.
5. Anywhere from 15 in my undergraduate classes to 1 or 2 in some of my graduate classes.
6. Very rarely.
7. I am not sure either. I had excellent grades and work experiences when I graduated, so I think male or female, I would have gotten a job fairly easily.
8. Sometimes. My co-workers have worried more about how to treat me or what to say since I'm a female. I think my boss is more likely to respond to someone being crude if I am with him than if it was one of my male co-workers. However, I was the only female at my female at my company for a long time.
9. We have a salary privacy policy, so I don't know how much my male co-workers make.
10. (no answer)
11. Encourage students to take math and science classes. Educate students on different opportunities in the fields of engineering and science. If you ask, many engineers would give you a chance to visit with them on their careers or to come and give a presentation. While it is harder to set up, visiting offices or job sites is another way to learn about engineering. I have a co-worker who escorted a class around a construction site a couple of weeks ago to show what a structural engineer does. It has to be planned and set up, but the opportunities exist.

Engineer #2: Mansoureh Tehrani

1. I enjoyed solving problems; doing puzzles.
2. I was more of a leader, than a follower. I was very independent and had a streak of rebellion in me.
3. I was great with logic and algebra type problems; I did not enjoy Geometry and had to work very hard to complete proofs.
4. In my country, you chose a major (math, science or literature) in high school for 9th-12th grades. Because I enjoyed solving problems, I chose math. Since I went to an all-girl school, everyone in my major (upper or lower math) was female.
5. I received my master's degree in computer science in 1979 from (the) University of Texas. I was in their first graduating class. There were very few females in my classes.
6. No; I did feel unprepared. I did not have a lot of hands-on experiences before joining the program.
7. It is hard to pinpoint the sources of my challenges in getting a job after college. I was a female, from Iran who had graduated during the Hostage Crisis in a male-dominated industry.
8. Not as much as I used to be. After you prove yourself at work, people respect you regardless of your gender.
9. I work in the education field, not engineering now. The district has a standard salary. When I worked in the industry, I did make less than my male counterparts.
10. All the time. Those have always been great in keeping me focused to do better.
11. Invite female role-models to class; incorporate projects that utilize everything that is meaningful to girls (problem-solving, community service, team work, communication, ect.)

Engineer #3 Jessica Jette

1. Ever since I was a young girl, I loved space and everything that it involved. I wanted to be an astronaut. My grandfather was in the air force so he used to show me different types of planes and jets which got me interested in Aerospace Engineering and Physics. I wanted to know how and why the universe worked the way it did.
2. I wasn't so much "different" from girls in middle or high school- I liked to do girl things and was very girly in appearance. But I loved math and science, which were typically boys' subjects. But I didn't let that stand in my way.
3. I didn't work hard in math- it came natural to me. I loved math and everything that was involved with math. Math, in a sense, was my English. Now ask me how hard I had to work in Language Arts and History and I will tell you that I struggled.

4. In high school, there was a large amount of females in my Pre-calculus and calculus AP class, but the majority was still males.
5. In college, my engineering classes were majority males. I would be lucky if I wasn't the only girl in the class (which for most of the courses, I was). But I enjoyed class a lot more and could focus a lot more.
6. Honestly, many times. I had many male professors in my engineering and science courses believed that I could not succeed as a female in upper level courses. They would always ask if I was in the correct class. And it would anger me, but I ended up using that criticism to push me harder in class and to strive to succeed. It was my personal goal to show those who doubted me, to be better than all of the males in the class.
7. I took a job with Carrolton-Farmers Branch ISD teaching mathematics. I believe that some fields may give females a hard time during interviews for a job position, but if you have the knowledge and experience to back your skills up, you will have no problem getting a job.
8. I have never been treated differently at work, but I believe it still occurs.
9. N/A
10. N/A
11. I believe, as a teacher for engineering and science focused students, that encouragement and support are strongly needed. All students can succeed in any subject if they desire. I believe that introducing all the possible opportunities for students in engineering and science will; gain more interest from both male and females. I also believe that if females knew all the different engineering and science positions out there that are occupied by women, they will be more inclined to take the courses and to follow their dreams.

References

- 1.) <http://www.eifgrants.org/info/women.html>
- 2.) http://www.swe.org/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=98
- 3.) <http://www.graduateshotline.com/ranks/>