Why Girls Should be Encouraged to Pursue Their Interest in STEM

Last summer, I started noticing that my two-year-old daughter, Lizzie, was becoming an enthusiastic user of several devices in our home, such as the smartphone, iPad, and desktop computer. As a former educator who has a PhD in education, I understand the importance of encouraging students to pursue their interests. Particularly, I had passionately encouraged children to take an interest in STEM (science, technology, engineering, and math). In my 10+ years in education, I saw firsthand the harsh reality of the technology gender gap. I also have experienced it as a CEO of a high-tech start-up. This is why I needed to take my encouragement of Lizzie's interests one step further.

I am not only a former educator, I have worked with a wide range of individuals as a gang researcher, which helped me to understand the power of encouragement. My PhD in education led to a career in education and in the public sector for decades, where I designed and provided services to make life better for underserved families and children. As I watched Lizzie progress from inquiring about technology to becoming an adept user, I drew upon my professional experience and knew I needed to do more to encourage and support her talent. I have worked with countless students who didn't pursue their aspirations because society told them that the path they wanted to travel was not for them. Gang members, for example, typically fall victim to a criminal life because they are told that criminal life is their only option. My daughter has not gone down this path, fortunately, but I have seen the possibility of Lizzie becoming a victim of the stereotypes bestowed on girls. Gender biases have pushed so many talented girls into different paths when they could have become scientists and engineers. I certainly didn't want this to happen to my daughter, so I took action.

With 12 million infants and toddlers in the United States, who are surrounded by and engaged in technology, we should repave the way so that more girls will take on leading STEM roles, break the stereotypes and gender biases, and be more prepared to compete in a global economy.[1]

In our society, girls reveal at an early age that they are tech-savvy and are able to calculate and solve complex problems, which are early signs of understanding math and science; yet, by the time they reach high school, their interest in math and science commonly diminishes. The fact is they are often told that boys are better at math and science.[2] Here are some startling statistics:

- 21% of girls say their parents have encouraged them to become an actress, while only 10% say their parents have encouraged them to think about careers in engineering.[3]

- Girls make up 56% of AP test-takers, 46% of all AP calculus test-takers, but only 19% of these girls took the computer science AP exam.[4]

- Women earn 57% of all undergraduate degrees,[5] 42% of all math and statistics degrees, 40% of all physical science degrees, but only 18% of all computer science undergraduate degrees.[6]

- In the United States, only 12% of engineers are women; 2% of engineers are women from underrepresented minorities.[7]

So why should we encourage girls to take an interest in STEM careers? Studies and research by The National Center for Women in Information Technology (NCWIT) present some very persuasive arguments:

- Girls and women are avid users of technology, yet they are underrepresented in the development of technology. If technology is created mostly by half of our population, which is male, then we are missing out on the innovations, solutions, and creations that 50% of the population could bring.[8]

- The US Department of Labor estimates that by 2020, there will be more than 1.4 million computer-related job openings. At current rates, however, we can only fill about 30% of those jobs with US computing bachelor's grads. Girls represent a valuable and mostly untapped talent pool.[9]

- With computing jobs among the fastest-growing and highest-paying, more women should benefit from these occupations.[10]

One way to influence change in this area is to combat stereotypes. As such, I created a new world in my children's book series, *The Adventures of Princess Lizzie*, where the heroine is a tech-savvy princess with a knack for inventing and programming new apps and devices with the help of her charming and eclectic animal friends. The stories are children-friendly but feature advanced vocabulary and concepts, which make a great read aloud and interactive experience for the whole family.

I created the heroine in *The Adventures of Princess Lizzie* book series to be cute and girly because I wanted to show that girls also can be decision-makers, thinkers, and capable of using everyday technology, which is rarely shown in children's books with female leading characters. Other than the fact that she is quite privileged and has access to endless resources and magic, her curiosity and intelligence represents girls everywhere.

Whether a girl wants to be a scientist, engineer, or mathematician, she should be encouraged to pursue her interest and be given equal formal and informal opportunities as well as boys who are preparing for STEM careers. I also speak from my own experience. I grew up poor but was fortunate to be exposed to computers and complex math at an early age due to my older brothers' interest in these subjects and with my mother's encouragement and support. With the proper guidance and resources, girls can become powerful leaders in the STEM world, and I want to help with that effort.

References

1. McCormick Foundation, *The Youngest Americans: A Statistical Portrait of Infants and Toddlers in the United States*, 2013.

2. http://www.forbes.com/sites/work-in-progress/2012/06/20/stem-fields-and-the-gender-gap-where-are-the-women/: The problem starts as early as grade school. Young girls are rarely encouraged to pursue math and science, which is problematic, considering that studies show that a lack of belief in intellectual growth can actually inhibit it. In addition, there exists an unconscious bias that science and math are typically "male" fields, whereas humanities and arts are primarily "female," and these stereotypes further inhibit girls' likelihood of cultivating an interest in math and science. Popular culture plays a role as well. Girls grow up seeing women in powerful positions as doctors and lawyers on TV, but the media continues to promote stereotypes when it comes to programmers, often portraying them as geeky men.

3. Harris Interactive for the American Society for Quality, 2009.

4. The National Center for Women in Information Technology, *Girls In It: The Facts*, 2012.

5. National Science Foundation, 2009.

6 .The National Center for Women in Information Technology, *Girls In It: The Facts*, 2012.

7. Ibid.

8. Ibid.

9. Ibid.

10. Ibid.