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The Perceptions of Cyber Security in High School Girls

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ABSTRACT

The number of data breaches that have happened in the last decade is too high to consider it a small problem. The optimal solution to problems like this is creating cyber-awareness among youth and industry alike.

The cybersecurity field is a predominantly male field. With this research, we aim to understand why it is so when there are so many talented women. Studies show that the number of middle school girls who have an interest in the cybersecurity field reduces by more than half by the time they finish high school. What are the underlying reasons for this decrease? What changes in the perceptions and interest of middle school girls when they reach high school? This qualitative study will gather perceptions, interests, and knowledge of cybersecurity of high school girls.

Keywords

Cybersecurity, perception of cybersecurity, high school girls, changes in perception of cybersecurity

INTRODUCTION

This is the age of technology. With great advantages often come great disadvantages. Cybercrimes are the epitome of disadvantages. In the recent past, there have been several data breaches. The Equifax breach (Gressin 2017) is one of the biggest cybercrimes of this century. Cybersecurity is defined as a set of activities to protect computer hardware and information from threats (Sharmistha Bagchi-Sen 2010). Cybersecurity is a part of Information Technology. Cyber awareness is necessary to address cybercrime issues.

Today's teens are very engrossed in technology and everything it has to offer. Young girls draw inspiration from many popular figures, whether in real life or in fiction. They draw strength from the people that they believe are worth following. We have many real-life role models for women in the form of Jane Austen, Beyoncé Knowles, Sheryl Sandberg, Hillary Clinton, Ruth Bader Ginsburg, and Coco Chanel, to name a few. These women prove that hard work and resilience are pathways to success. In the fictional world, Hermione Granger, Temperance Brennan, Jessica Jones and Diana Prince are a few exemplary women. It comes as a shock then that there are only a handful of women who are leading in the IT fields all over the world – Sheryl Sandberg (COO, Facebook), Susan Wojcicki (CEO, YouTube), Ginni Rometly (CEO, IBM), Amy Hood (CFO, Microsoft), Ruth Porat (CFO, Google), Meg Whitman (CEO, Hewlett-Packard) (Pomerantz 2017). The number of women in cybersecurity is only 11% (Frost 2017). This number has not changed since 2013. The underlying question is – why? This research paper attempts to understand why interest shifts from cybersecurity as a girl moves from middle school to high school.

LITERATURE REVIEW

It is high time that cybersecurity is recognized as a discipline in its own right. It is a false notion that the field of cybersecurity only requires security analysts and researchers. There is a need for policymakers, lawyers, resource managers and developers (Ricciuto 2017) within the field.

A study (Frost 2017) indicates that even though women have higher education levels than men, very few are in a position of authority. Some of the key reasons why they leave are workplace environments, inability to use creativity, and job dissatisfaction (Catherine Ashcraft 2016). Shamla Naidoo, the Global Chief Information Security Officer of IBM expresses her thoughts that resonate with an echo – "With increasingly sophisticated threats and the demand for security talent soaring, the cybersecurity field is one that absolutely cannot afford to neglect the population of women and the many talents they offer" ((ISC)2 2017). These thoughts are not far from the words of Hillary Clinton – "Women are the largest untapped reservoir in the world" (Combe 2012).

Middle school and high school girls are at a critical age for deciding on a career path (Mistler-Jackson 2003). A study was conducted to determine if this is the age where they develop or lose interest in STEM fields (Petroff 2017). The data was collected from 11,500 girls across 12 countries. Analysis of this data lead to the conclusion that motivating and encouraging girls with ages between 11 and 15 is crucial in shaping their careers in STEM fields.

There are several misconceptions surrounding the field of cybersecurity about long hours and late-night shifts, which raise security concerns for females. A part of this could be attributed to the lack of female mentors in educational institutions who can guide them (Sharmistha Bagchi-Sen 2010). Today, there are many resources available to young women who are interested in cybersecurity. Many scholarship initiatives have been introduced to entice more women to enter the security fields. The National Science Foundation (NSF) and the Department of Labor have undertaken several initiatives to fund and develop programs to encourage young girls to pursue cybersecurity (Rose Shumba 2013).

It is often the case for humans that we do not place worth on an activity unless we experience it firsthand (Galen E. Turner 2014). A novice would not understand the thrill of skydiving unless he experiences it. Louisiana Tech University introduced a Cyber Discover program to facilitate interest in cyber sciences among high school children (Galen E. Turner 2014). The data collected from the female students who attended this camp led to the discovery that their teachers played a major role in their decision about STEM fields because young girls are interested in hands-on work with someone guiding them.

Many women underperform at the workplace when they are the minority (Laura Smart Richman 2011). Women are subject to stereotypes that threaten the progress they have made so far. Gender stereotypes have a negative effect on their performance (Williams 2012). There is an urgent need to discard these stereotypes and opt for gender neutrality when it comes to education and work environment. It is noteworthy that the women who are currently working in the field have overcome many obstacles and yet, are still discriminated against. The authors heap compliments on them for their resilience. These women have firsthand experience of dealing with these obstacles and hence, pave way for the next generation of women so that they do not have to face the same obstacles and discrimination. And so they trust in their abilities and support each other (Laura Smart Richman 2011).

RESEARCH METHODOLOGY

To understand why the number of high school girls interested in cybersecurity is less, we need to understand the reasons behind their opinions. Are they afraid that cybersecurity is no place for a woman? Are they worried that people will think of them as "geeks"?

A qualitative study would be most beneficial for this research. Using a series of unstructured, open-ended questions will help us understand the reasons behind their choice. The answers to these questions will provide a deeper insight into the minds of young girls. This data will be transcribed and analyzed until a pattern can be observed. Using this data, we can introduce a curriculum that will enable them to pursue a career in cybersecurity. A list of questions is available in the Appendix.

CONCLUSION

Cybersecurity is on the rise, as is the number of cyber threats. The number of unfilled cybersecurity jobs could prove to be very expensive to the world economy. There is a need to fill these positions with diverse, qualified, competent, intelligent and innovative people. There is a growing need to educate high school girls about the tech fields, especially cybersecurity. The severe lack of research about why the number of high school girls interested in cybersecurity is less is very discouraging. This calls for more research efforts into understanding the ideas and opinions of young women regarding cybersecurity. In a time when there are few role models for young girls, it is important to educate and encourage them to pursue careers in cybersecurity. There is a need to break the glass ceiling and pave way for a new generation of young women who are interested in the cybersecurity field. To do this, cyber awareness should become the highest priority in any educational institution or an industry.

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APPENDIX

The questions we want to ask the high school girls will provide insight into their opinions about cybersecurity. It is very important to know their opinions as it might help educational facilities to develop curriculum that will inspire and encourage them to pursue security fields.

- Can you tell me what some of the courses that interest you are?
    - Does your decision to take these courses have any outside influence?
    - What would you describe as your strengths in academics?
- What are your professional ambitions?
- What are your main concerns while choosing a career?
    - Who are your role models in that profession?
    - What do you look for in a role model?
- What does success mean to you?
- What do you think of when you hear the word technology?
    - How much time do you typically spend working on your computer/laptop in a day?
    - How much time do you spend working on programming languages?
- What are your opinions about the STEM fields? Which of the STEM fields is the most appealing to you?
- What do you think cybersecurity means?
    - What is the first thing that comes into your mind when you think about cybersecurity?
    - What, according to you, does a typical cybersecurity professional look like?
- There are only 24% of women in the tech fields and only 11% in the cybersecurity field. Why do you think the number is so small?
- There are a lot of resources available to young girls who want to pursue cybersecurity as a career. How many of these opportunities do you know of?
- The number of female faculty is half the number of male faculty in many educational institutions. On a scale of 1 to 10, how helpful do you think it would be to have more female faculty teaching you?
- The number of female students who took an AP Computer class in 2011 is 19%. What do you think of that figure?
- In the recent past, many educational institutions have introduced camps related to computing and cybersecurity. What are your thoughts about it?