GIRLS DISCOVERING STEM/STEAM EARLY IN LIFE

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Introduction

The United States workforce of woman is on the rise but not in the fields of Science, Technology, Engineering, and Mathematics (STEM); Science, Technology, Engineering, Art, and Mathematics (STEAM) (STEM; American Association of University of Women). The United States future job growth is continuing to be in STEM/STEAM fields. These fields have been addressed by the Obama administration and now a major influx and concentration within the all the core subject areas in school districts. In an interview with former President Obama, he stated that at an early age every child should learn to code, starting at the elementary level in conjunction with learning the "ABC's" and continuing throughout child's school career (President Obama on the Importance of STEM Education, 2015). Computer Science resources such as coding, robotics, programming and computational thinking are the compelling forces within the STEM/STEAM directives and is the influential focus within a major overhaul of the educational system for the United States.

Background/Problem

Computer Science education drives innovation in our country. Innovation is vital for the United States to be competitive in the globalized world. Our graduating students must be able to be competitive in the sciences, technologies, engineering and mathematics domestically and abroad. Within this multi-level STEM/STEAM job market, there are barriers and stigma associated that derail girls/women from continuing on in these specialized sciences. There are three obstacles that get in the way of girls interest, achievement, and persistence in the STEM/STEAM world: (1) specific learning environments, (2) peer relations and (3) family characteristics (Dasgupta & Stout, 2014).

Solution

Exposing students to computer science education at a younger age is a major viable solution that can peak the interest and the imagination of our young future scientists. Curriculum adjustments should include more tinkering, figuring out how things work, and exploring the real world activities for all not just positioned toward the boys interests but also girls can provide adequate incentives to pursue additional STEM/STEAM interests. In do so, these activities may peak the girls interest in taking part in becoming young computer scientist, roboticists, programmers, or developers which could eventually narrow the gap between the gender gap.

There are many established clubs for girls only such as: Girls Who Code HQ, and Made With Code which are set up specifically geared for the girls who are interested in learning how to code. Along with before and after schoolteacher created coding clubs where the focus is on individual interests and creativity in a relaxing atmosphere. MakerSpaces are available to all students to tinker in which could help in creating a safe and fun place for girls to be creative without feeling uncomfortable or stifled by the boys. Focus on collaboration and peer influence is very important in the middle school to high school years of girls. Family and teachers can spark the interest in STEM fields for girls by introducing at an early age STEM female professionals as role models. In the primary education levels combining robots, math, coding and everyday articles are important in creating and sustaining girls interest in this field. One such activity is the “Droid Inventor Kit” by LittleBits This kit takes building and coding to the next level by encouraging engineering, building, and inventiveness. STEM/STEAM focus activities at an early age must provide direct and clear objectives, which allows for interaction, hands-on applications, free flowing ideas without negative criticism and allowing for mistakes to be adjusted in a positive and encouraging approach. In addition, having fun is a necessary,

important and healthy piece of this complex STEM/STEAM educational puzzle. For older girls there are many opportunities such as outreach programs.

A proposal to present various STEM/STEAM activities to increase and sustain engagement for girls starting at an early age in school was sent to EdCampNJ Encore which is to be held on January 20, 2018 in New Brunswick, NJ.

Conclusion

Many schools face a challenge to include STEM/STEAM activities in the curriculum because of lack of time and resources. There is time by capturing the excitement, enthusiasm and just plain interest in the student's surroundings at a young age. In young students, especially girls there is an innocent curiosity about the world and what better way to open up that door and revealing that STEM/STEAM is all around them from water droplets, to grass, to cell phones to iPads to highways to really anything that can be bought in stores. It is very important to catch this imagination and nurture with curiosity and the questions of "why" and "how" of our world which encourages all students to want to learn more. In

Going along with encouragement is grit. Girls possess grit, which is the essence of determination, passion, and motivation striving for a goal. Angela Duckworth, author of Grit, stated: "I am encouraging my girls to cultivate their interests and a sense of purpose, because I want them to have a passion that guides them for their entire lives"(Q&A, n.d.).

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Appendix A

EdCampNJ Encore 2018
@ New Brunswick HS
January 20, 2018

Invitations will be sent out soon!

ABOUT EDCAMPNJ

EdcampNJ is a yearly unconference designed specifically for teachers, supervisors, and administrators who want to take the lead in their own professional learning, development, and community.