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Abstract

The tech industry is a lucrative field. However, it has one of the worst gender gaps with regards to women of any industry. According to the United States Equal Employment Opportunity Commission, women in tech are underrepresented by 12% when compared to all other industries. Researchers such as Sarah-Jane Leslie write that women are deterred from entry starts in middle/high school. Rosemary Edzie from the University of Nebraska explains in a study that confidence gaps due to gender norms, a lack of resources, and limited support networks are the root cause of why girls aged 12-17 do not pursue higher tech fields. One particularly bad area is the Freehold Regional School District in New Jersey, of which less than 1% of female graduates pursue tech. However, afterschool computer science learning programs for middle/high school women, like Girls Who Code, have seen success in providing education to over 11,000 young women, raising the interest rate of computer science by 32% and maintaining a net budget surplus of $6 million. As such, the plan of this project is to replicate the infrastructure and success of programs such as Girls Who Code in order to motivate and empower the female students at FRSD to pursue computer science. This is done through an afterschool 2-hour mentorship program over the academic year, hosted at local schools/libraries to teach introductory computer science by experienced mentors. The price of this plan is about $7500. Funding will be provided in full through the $250,000 Google Educational Research Grant.

Budget

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| **ITEM** | **QUANTITY** | **UNIT PRICE** | **TOTAL** |
| Lenovo M23 Chromebook laptop | 30 | $179.00 | $5370.00 |
| Transportation (gas, bus, train, etc.) subsidy for mentors/teachers (maximum subsidy allocation per week) | 60 | $30.00 | $1800.00 |
| Teaching supplies (whiteboard markers, notepads, pens, pencils, etc.) | 1. 144 dry-erase markers 2. 3 large dry-erase whiteboards 3. 120 notepads 4. 300 pcs. Chalk 5. 432 pencils w/ erasers | 1. $73.98 2. $82.08 3. $86.60 4. $29.40 5. $29.97 | $302.03 |

Budget Justification

FRSD is a large schooling district, so a few centralized schools that are close to the others for afterschool activities such as Freehold Township High School and Manalapan High School will be ideal locations. Both of these schools have large media centers/computer labs, so there will be widespread access to computers. Despite this, the budget allocates 30 Lenovo M23 Chromebook laptops for emergency situations in which the media center is either preoccupied or the computers are not working. Additionally, the members of the program will be encouraged to bring their own laptops and coding devices for optimal learning. All of these measures are taken to ensure that each individual student is not left without a computer to learn from, and can always participate in the day’s activities. Another benefit of the program is that the instructors are volunteers from local colleges, which means that they do not need to be paid a salary. However, travel subsidies are allocated in the event that instructors need financial support for gas, train tickets, bus tickets, etc. This is done to ensure that the instructors are not only able to access the event, but also so that they are incentivized to keep coming. In fact, previous afterschool learning programs such as Microsoft FOWNDERS, TEALS, and Girls Who Code see a surplus of volunteer instructors and have to ration them because travel is covered and people are eager to teach the next generation of students. Finally, the budget allocates for basic instructional supplies. Afterschool tech programs are very cost-effective namely because they don’t require any resources beyond a computer and teacher to teach basic skills such as coding, data structures, etc. However, chalk and whiteboards are allocated in the event that the media center/library does not have them for instructional use. Additionally, students may need to etch out concepts using a traditional pen/notepad. These are provided as well. Finally, advertising costs are essentially free for two reasons. First, Freehold Township High School and Manalapan High School have built-in advertising systems such as morning announcements, advertising boards in hallways, and approved afterschool programs on the club website. Second, website setup and hosting is both easy and free with a somewhat competent web-developer, such as a volunteer from one of the local university clubs.

Timeline

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| **TASK** | **OBJECTIVE** | **TARGET DATES** |
| Work with FRSD staff on logistics | This is the initial setup process that allocates classrooms, times, students, and supplies for next academic year. | May 21 - 31, 2017 |
| Advertise program to FRSD students and instructors at local colleges | The methods of advertisement have been described in the budget justification. Additionally, clubs and organizations such as the Undergraduate Student Alliance of Computer Scientists (USACS) at Rutgers University already have a teaching program in place at the HEROES Academy in New Brunswick, as well as a surplus of volunteers. Advertising will be done in coordination with the USACS Community Outreach Chair and Social Media Chair. | June 10, 2017 – September 31, 2017 |
| Process Applicants | The program will process and organize applications for both students and instructors. | October 1 – 10, 2017 |
| Announcements | The program will send out confirmations to both instructors and students, telling them which school to go to as well and clearing up logistical questions. | October 17 – 25, 2017 |
| Launch | The program will launch and start teaching the fundamentals of computer science to young women across the FRSD. | October 31, 2017 |

Discussion

The afterschool computer science program held at Freehold Township High School and Manalapan High School will provide young middle and high school women the skills, attitude, and motivation to succeed in an industry with poor gender performance. Modi Kamla et. al from the Girl Scout Research Institute write in a report that afterschool programs such as this are the key to ensuring that young women do not fall behind in the tech surge, and are able to access opportunities on the same level as their male peers. The endemic problems that deter women from computer science, such as poor confidence, a lack of resources, and no role models are all mitigated or solved in part by this program. Similar initiatives such as Girls Who Code have seen growing net surplus of revenue, over 100 more women per program interested in pursuing computer science, and an overall 40% increase self-confidence. This program aims to achieve similar results by using the same methods of success.

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<https://www.amazon.com/Creativity-Street-1760-Blackboard-Chalk/dp/B000RRYM7I>

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<http://www.greentaxexpert.com/index.php?route=product/product&path=69&product_id=82>