OUR MISSION

We empower and connect women in computing

Our mission is to help women students develop their highest potential by growing the pipeline of women in computer science as well as retaining the women who have entered into the field.

Inspiring Young Minds:

Introducing Middle School Girls to Computer Science

Overview

We believe that a crucial step to increasing the number of women in computer science is getting them involved in computer science from an early age. We propose to begin a program introducing middle school girl students to computer science, through extracurricular programs at local middle schools.

We will design hands-on curriculum which will be taught by current computer science university students. Our goal is to bring this program to all of the middle schools in Ann Arbor and later on in Ypsilanti or other surrounding school districts, but we will begin by piloting this program at one middle school in Ann Arbor in Fall 2018.

Planned Activity

Specifically, the middle school outreach program will be 15 weeks in duration and will consist of 2 modules:

- **The first module** (*the first seven weeks*) - "Discover Computer Science": will give a broad overview of the many exciting applications of computer science. It will introduce students to key programming concepts, as well as expose students to current work being done in the field.
- **The first module** (*the final eight weeks*) - "Intro to Python": will be a comprehensive introduction to Python, an easy-to-learn programming language. In this module, students will learn enough programming to be able to write their own applications and programs. Though this module will be less application-focused, students will use the Python programming language that they learn to complete a final project. Students will be allowed to choose an application that they are interested in for their final project.

Instructors

Initially, we will admit forty students. If there is overwhelming interest in the program, we will consider hiring more instructors and admitting more students. Logistically, this program will take place in the computer labs of the middle school that the program is run in.

Collaborators

We will work with Tiffany Marra from University of Michigan's *Center for the Education of Women* to identify a good middle school to run this program in, and we will work closely with school administrators and teachers to make sure that this program is a good fit for the school.

Long-Term Impact

We propose to implement this program in one middle school in Fall 2018. However, we are hoping that this program will expand to at least half a dozen middle schools within the next five years. Because this program will be under the auspices of Girls Encoded, there will be organizational continuity even as student instructors graduate.

Each year, Girls Encoded will handle the administrative details of setting up the program and will recruit undergraduate and graduate student instructors to work with students at each middle school. These instructors will be trained in successful teaching practices and will be given curriculum to work with. They will go through the required background checks necessary for working in schools, and they will be paid hourly for their work.

This program will be valuable for two groups of people - the middle schoolers participating in the program and the undergraduate and graduate student instructors. We hope that this program will inspire more middle school students to pursue computer science.

This will have a beneficial effect on computer science as a whole, but it will also lead to more women enrolling in the computer science program, which will lead to more diversity in the field. Our middle school outreach will also equip undergraduate and graduate students with teaching skills and experience, which is valuable in showing students how they can mentor and encourage future generations.

Evaluation

We will formally evaluate the effectiveness of our outreach, in order to gain insight into the best methods for encouraging women to study computer science. This formal evaluation will be done through surveys. We will survey participants of the program before the program begins, directly after the program ends, and six months after the program ends.

These surveys will measure the students' attitudes towards computer science, as well as any computer science activities they are pursuing on their own. Furthermore, we will survey a control group of students to compare against the students in our program. This control group of students will be middle school girl students from a separate local middle school with similar demographic and educational characteristics. We will incentivize students to take our survey using gift cards, and the survey will be conducted online.

These surveys will allow us to assess which portions of our program are effective and which are not, which will inform this outreach in future years. It will also help us to assess how much of an impact our program is having.

Budget

The largest expense in this budget is hiring student instructors. We anticipate hiring four instructors who will work each approximately five hours a week (preparing lessons and teaching). We will also need funding for promotional materials within the middle school, as well as supplies for the weekly lessons. Finally, our research expenses include incentives for students to take follow-up surveys.

Instructors (4) **5 hours** / week / instructor ($20/hour) **15 weeks**	**$6,000 for 4 instructors** ($1,500/instructor)
Promotional materials	**$300**
Supplies for curriculum	**$1,200**
Research incentives	**$500**
TOTAL	**$8,000**

Conclusion

Girls Encoded's middle school outreach is a valuable opportunity to ensure that women are given equal opportunities to pursue careers in technology. We believe that this outreach will have a long-term impact on the computer science culture both here at University of Michigan and among the broader technical community.

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