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IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Interactive Presentations - IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (IP)

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USING ACCESS TO SPACE TO BRING THE 'WHY' BACK TO EDUCATION AND STEM EFFORTS IN THE CLASSROOM

Abstract

The DreamCoder program gives students their first opportunity to act, think and work as an engineer on a space experiment. A unique STEM program that integrates all facets of Science, Technology, Engineering and Math, DreamCoder might better be classified as STEAM, incorporating crucial soft skills (Arts) required in STEM industries.

Focusing on the application of skills like coding, data analytics, adaptive communication and teamwork, DreamCoder gives high school and primary school students an opportunity to learn, practice and apply these skills in a real project, namely allowing student-designed code to run on our ISS platform, collecting the data and information that students need to complete their analysis. The students' final endeavor in this project is communicating their results to an authentic audience though creative, scientific, and commercial means.

Preliminary results after serving more than 2,000 sudents are remarkable - a large percentage of students identified DreamCoder as their first opportunity to apply and practice skills like coding and teamwork in a project environment, critical skills for any worker. Students, particularly those typically underrepresented in STEM, also reported feeling a high sense of achievement at the end of the project, admitting they feel more comfortable and confident moving into the workforce after DreamCoder. In particular, one school system said this was "one of the first projects where girls can see their role" and reported three times the number of girls in higher level physics classes as a result of participation in DreamCoder.

Key learnings that will not only further enable this program to engage a diverse range of students, but which can be adapted to other programs include: • Using space as a hook to engage broad range of student participants • Contextualizing and showing relevance of learning STEM skills strongly impacts motivation of target diverse audiences (ex. a group of girls that developed a moisturizing cream for the ISS environment after collecting and analyzing data on the internal humidity levels.) • Providing students with a hands-on approach to the Engineering Method. • Empowering educators to implement an engineering program that includes coding, regardless of their own particular experience of skill level in software engineering

By building on key learnings from our two-year pilot in Australia, we will improve student engagement, learning outcomes and teacher confidence in delivering the program themselves in their classrooms, enabling DreamCoder to launch globally and empower the next generation of innovators and explorers and their educators.