Self Efficacy of Middle School Kids in a Daily Required Game Design Class

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World Wide Workshop

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Overview

The study took place in 2010-11, within the context of a Globaloria class, a social learning network for learning game design, at a charter school. This is a required class for all students each school year. This report is part of a longitudinal study designed to measure the impact of Globaloria participation on interest in and pursuit of STEM educational and career paths.

Sample

189 charter school students: grades 6 and 7, 50% female, 83% economically disadvantaged, 83% Hispanic, 36% English language learners.
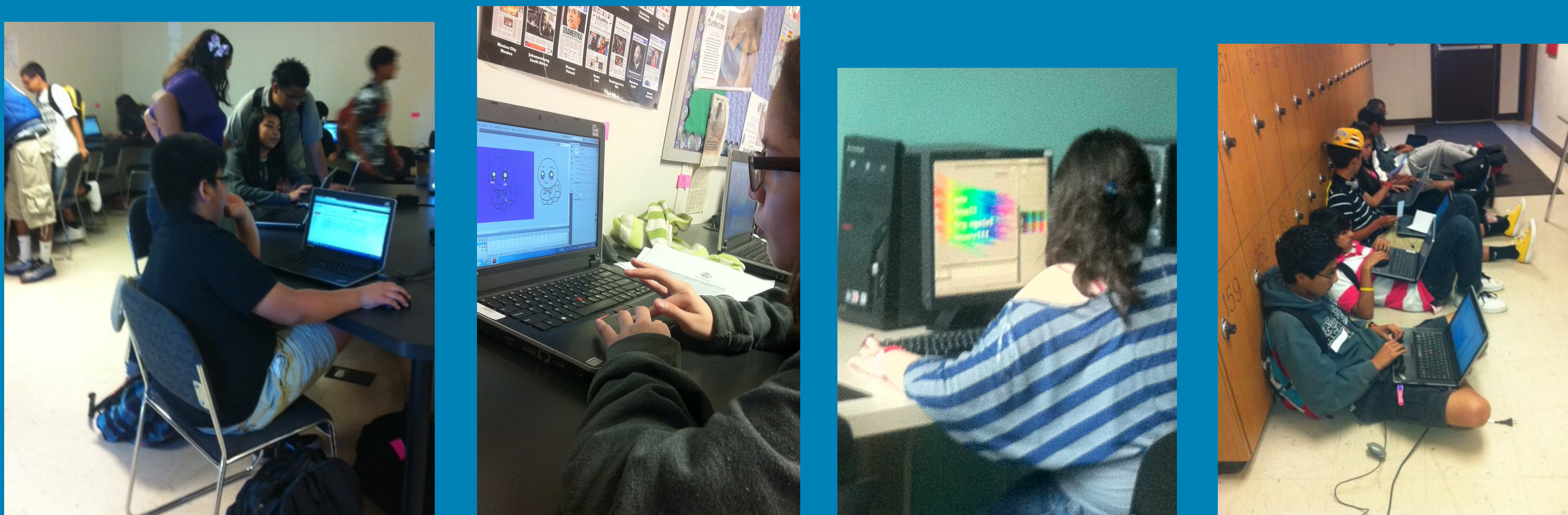

Figure 1. Students work daily in class, and during lunch and other free periods.

Method

Students took a brief (11-item) survey regarding their self-efficacy as engineering learners* 4 times during the school year. Students also participated in interviews about their educational video-game design projects. It was hypothesized that participation in a hands-on, collaborative, project-based curriculum would increase student self-efficacy as engineering learners In addition, researcher conducted design-based research in order to understand the context and observe the curriculum and classroom approaches in action.
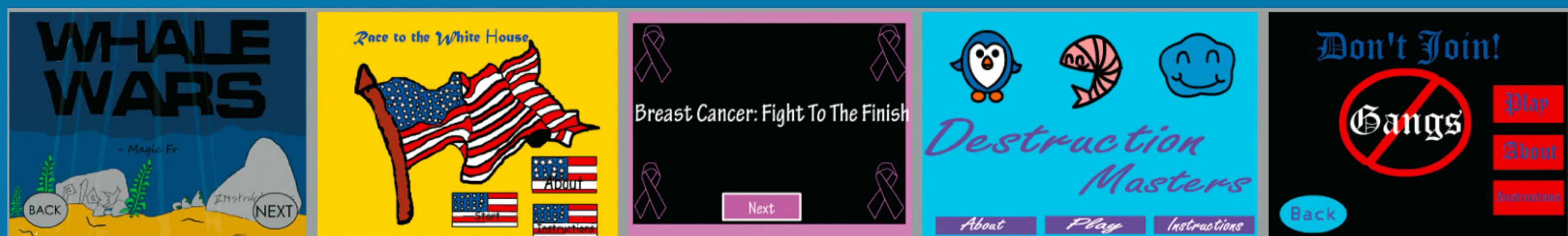

Figure 2. Examples of student games, all are playable at **Globaloria.org**

Instrument

The "self-efficacy for technology learning" instrument was designed to measure 3 aspects of self-efficacy that were expected to increase as a result of Globaloria participation: confidence that students can (1) regulate their own learning, (2) engage social resources, and (3) address technological challenges

Changes in Students' Self Efficacy

The Globaloria program blends the learning of content, research, digital literacy, computer programming and game design using a social learning network in a classroom setting. It is used by thousands of students in several states.

Early results from a longitudinal study show increases in self-efficacy with regard to students' ability to solve engineering problems and to express themselves on a blog.

How confident are you that you can…	6th grade girls (N=44)			6th grade boys (N=45)			7th grade girls (N=44)			7th grade boys (N=42)		
	T1	T4	change	T1	T4	change	T1	T4	change	T1	T4	change
figure out new things about editing the wiki	75.3	78.1	+2.8	82.4	77.6	-4.8	72.8	87.4	+14.6	74.6	80.6	+6.0
put your thoughts and ideas into words that are easy for people to understand on your blog	83.5	84.0	+0.5	72.3	79.7	+7.4	72.7	84.8	+12.1	75.8	84.0	+8.2
figure out what to do when you get stuck on something doing Flash ActionScript programming	71.4	79.1	+7.7	73.3	77.0	+3.7	61.5	83.8	+22.3	65.0	80.6	+15.6
search on the Internet to find help when you get stuck on something	77.0	74.9	-2.1	81.8	87.3	+5.5	74.9	84.8	+9.9	75.7	84.0	+8.3
Overall change			+2.2			+3.0			+14.7			+9.5

Figure 3: Student self-efficacy in Globaloria-related areas

Results

Students showed the anticipated increase in self-efficacy from the beginning of the year to the end of the year among 7th grade; the largest increases were among 7th grade girls. 6th grade students rated their self-efficacy very highly at the beginning of the year, making it hard to measure change from time 1 to time 4. (The instrument is being revised to better reflect student challenges and detect change over time.)
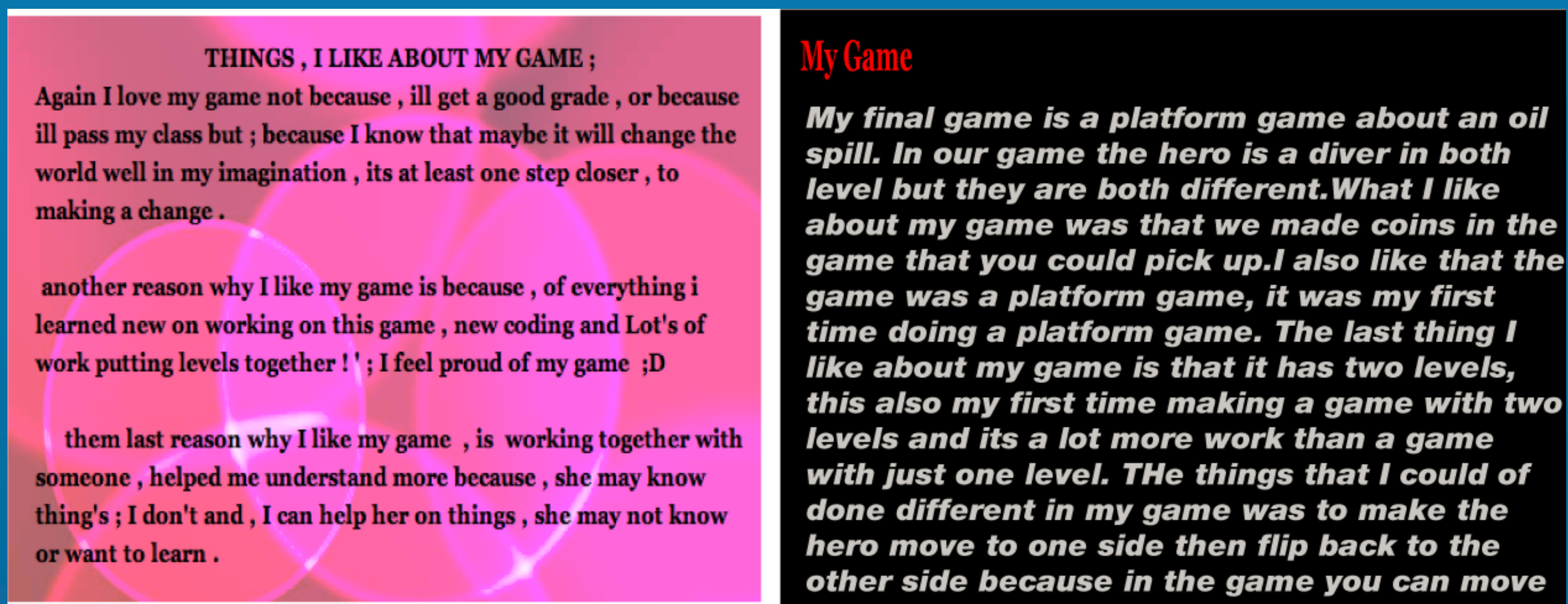

Figure 4. Sample blog posts from students in 2nd year of Globaloria. Students blog a few times a week about their experiences as game designers and about the content of the game and the challenges in coding it.

Discussion

The research literature consistently shows strong relationships between students' self-efficacy and academic and professional success, and that middle school is a crucial time for the formation of career and educational aspirations. This longitudinal study will continue to explore the associations between the development of technology self-efficacy and at-risk students' STEM educational and career goals and attainment.

The results from this study show that participation in Globabloria has a positive influence on technology self-efficacy for students with at least one year in the program; however, it also shows a need to refine the measure to ensure that it accurately measures self-efficacy for all student participants.

Additional papers with in-depth discussion of the literature, instrument development and statistical analysis are available at **WorldWideWorkshop.org/reports**
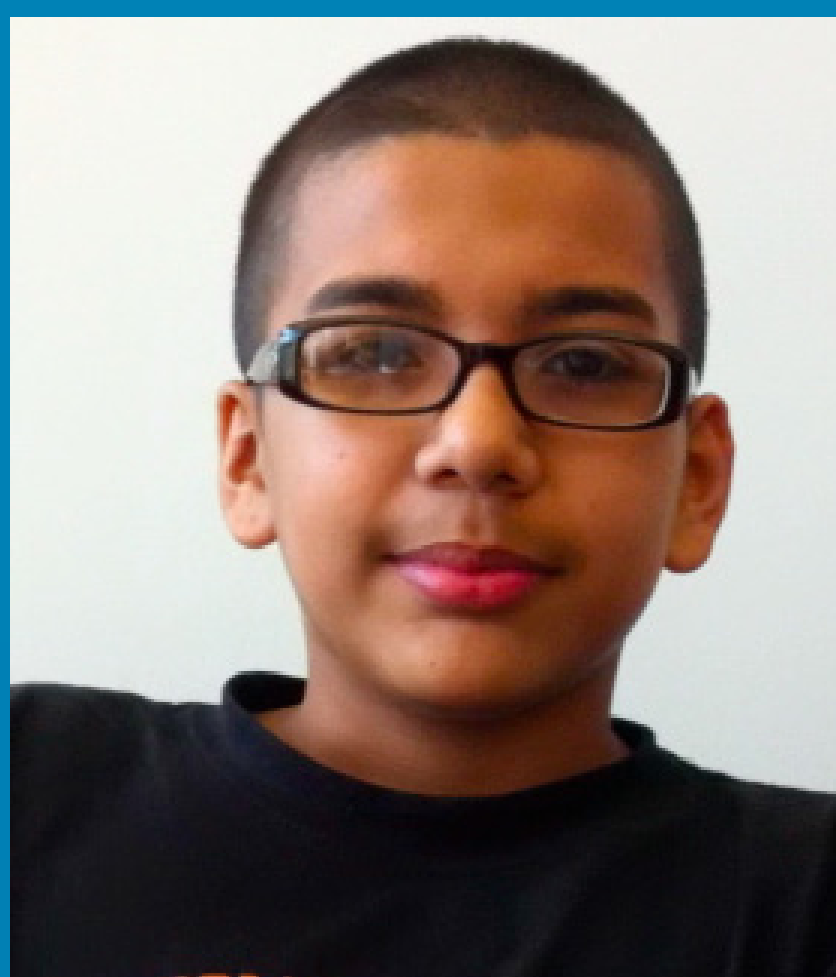
"I like it, because making games is hard and difficult. But playing games is kinda easy. I feel like that's for little kids that like games. And Globaloria is for me. Because I like creating games, and all the code, which would be difficult for a kid to do."

—*Ammar (7th grader)*
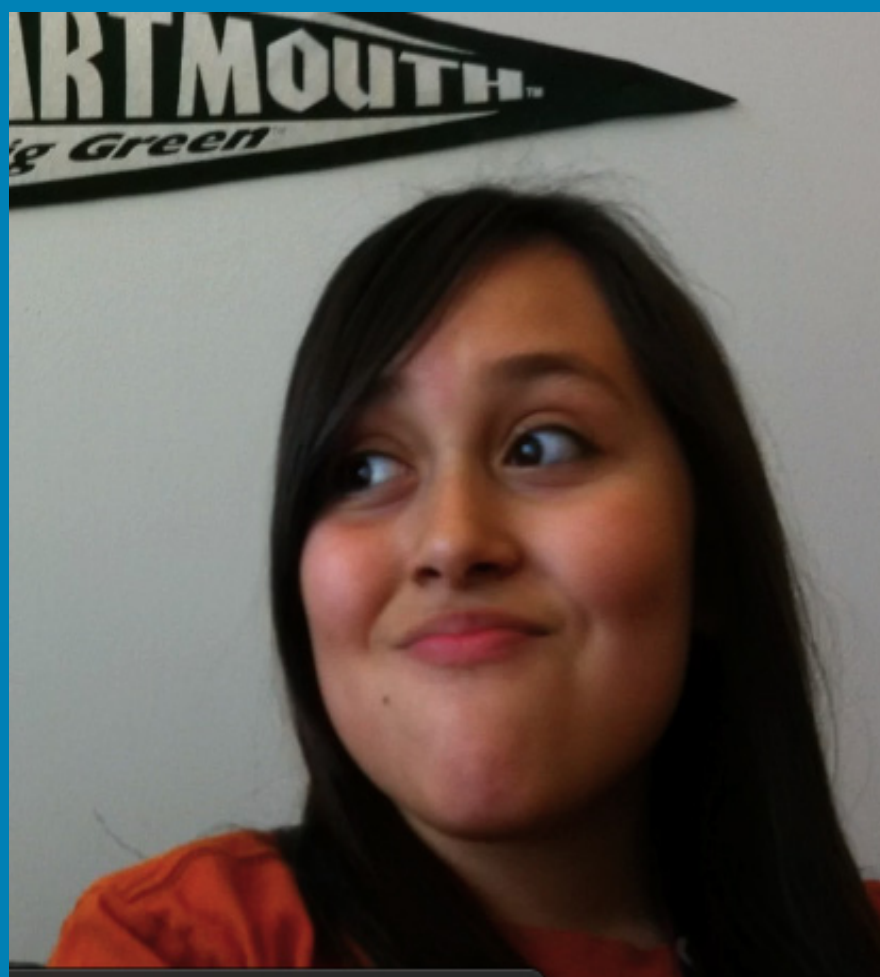
"I was proud once I finished it...I also learned how amazing Globaloria is, and how much Globaloria is important to the world, and how it is teaching the new generation how to grow up and leave the world in our hands, and so we will know how to take care of it once it's ours!!"

—*Genevieve (7th grader)*
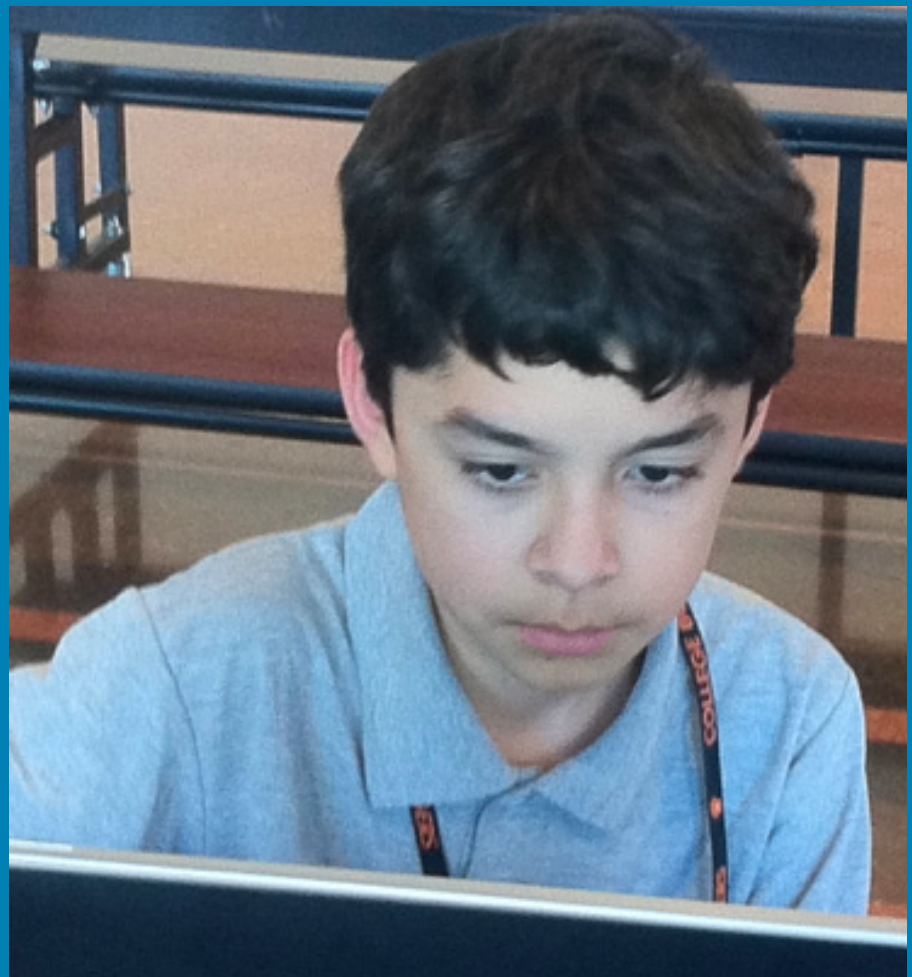
"I want to become an engineer, to help the lives of other people in Asia and Africa."

—*Michael, (8th grader, National Gold Medal winner of the Scholastic Arts and Writing Award)*

Acknowledgments & References

AMD Foundation

Changing the Game

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