



Early STEM Adoption Through CPSS240



Will Anderson

College Park Scholars – Science & Global Change Program

BS Economics

wanders1@terpmail.umd.edu

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Introduction

Beginning of 2022 Fall Semester, I was a part of CPSS240, a group of university students with the goal of introducing STEM education to young students in the College Park, MD community. Our curriculum used the LEGO Mindstorm EV3 system and Inquiry-Based Learning (IBL) to teach robotics, coding, and teamwork skills to these students. An emphasis was placed on using our knowledge of the adolescent brain and cognitive development to teach with an IBL approach that shifted the approach of teacher-guided lessons to student-driven lessons.

Site Information:

Mary Harris “Mother” Jones Elementary

2405 Tecumseh Street
Adelphi, MD 20783

Supervisor: Vivian Zohery

Mission:

Provide a student-guided learning environment focused on STEM education to Mary Harris Jones Elementary Students



Image: Students working together to build their robot platforms

Challenges:

This was our teams first time working with fourth and fifth graders in this role. Some students took more time to break out of their shells but became more open with time and positive feedback.

Impact on Self and Future Work:

Learning about cognitive development, the adolescent brain, and IBL, and then seeing it implemented into the classroom, was very refreshing to the traditional style of classroom I am used to. Additionally, working in a service-learning project like this one taught me much about myself and was an enjoyable experience to help others. Lessons learned from this experience will be implemented into my future teaching experiences and how I learn myself.

Discussion and Importance of these Programs:

One thing taken from this project, is the importance of implementing programs and lessons into the classroom like this that make learning exciting and allow kids to express their creativity in different forms.

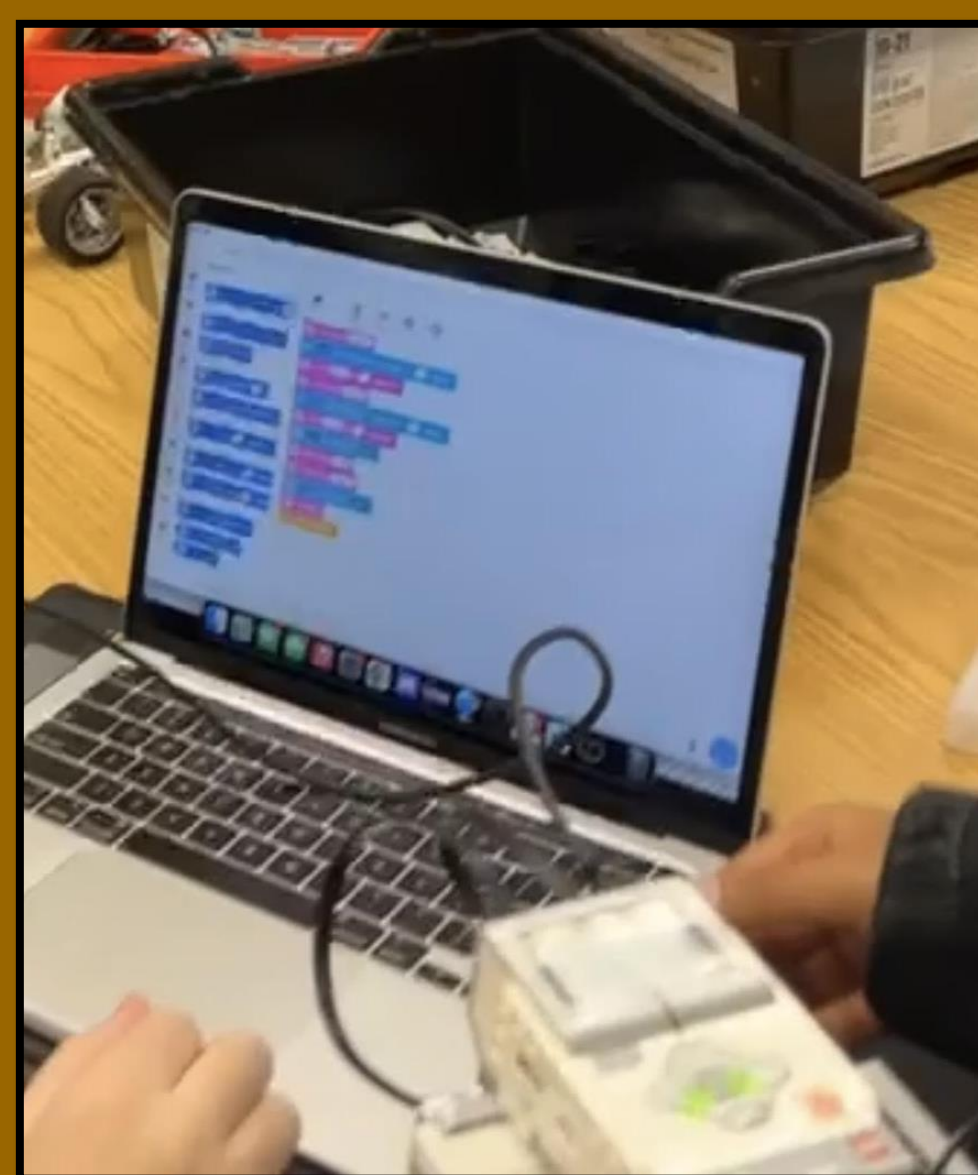
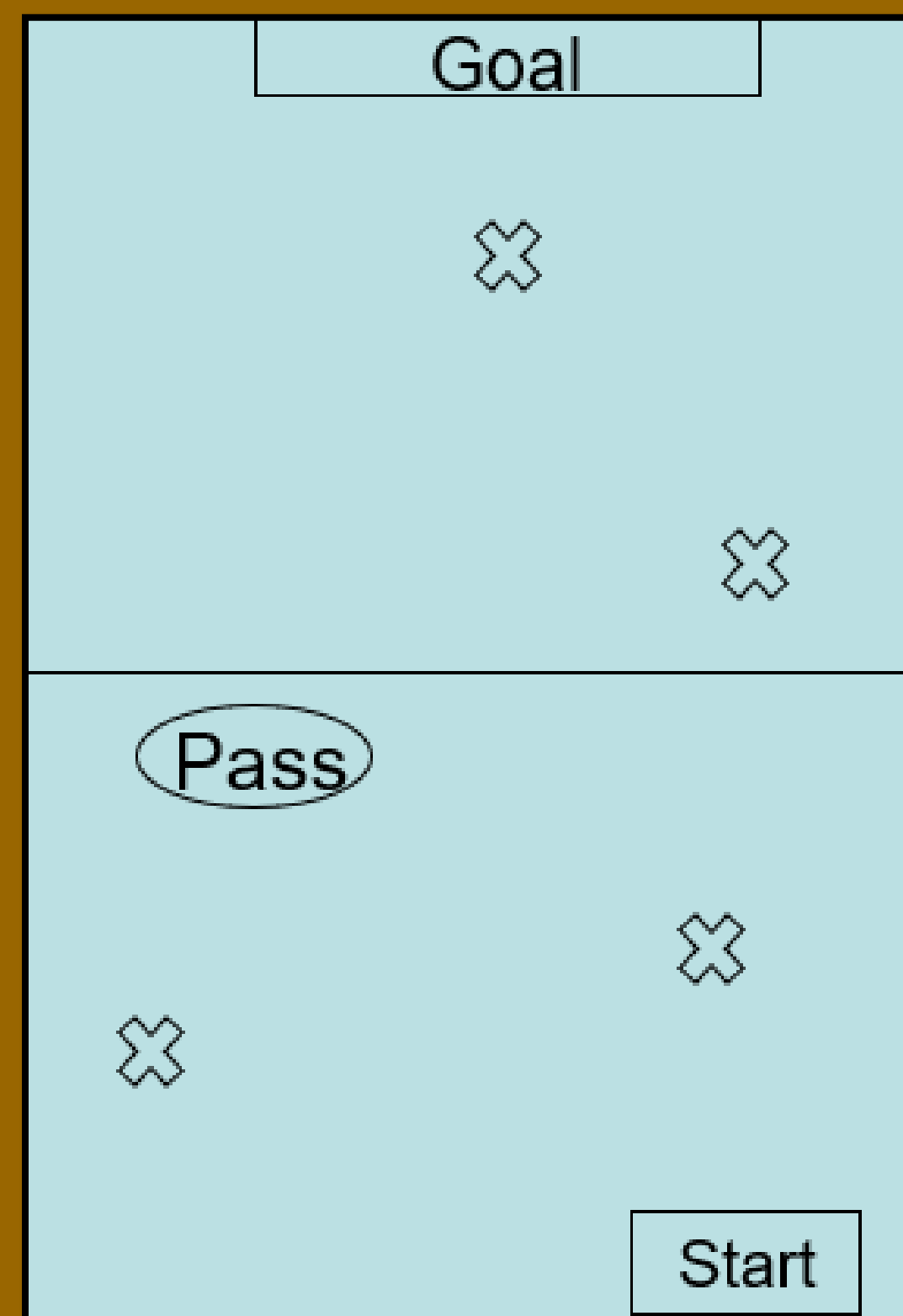


Image: Student exporting code onto robot



Instructions:

Two groups of five were asked to design and build two robots that incorporated two color, touch, or ultrasonic sensors to guide them. The first robot's goal was to dribble past two defenders and pass the ball to the second robot. The second robot's goal was to dribble through two defenders and score the ball.



Inquiry-Based Learning Approach:

An IBL approach in the classroom emphasizes on the students actively seeking out knowledge or the solution to their problem themselves. In the first lesson, we interacted more with the kids as we introduced ourselves, formed teams, and helped familiarize the students with the robots. However, they soon began designing and building their robots as teams with minimal help from us. Similarly, during the coding process, we first showed the coding software and introduced basic operations, but then they were left to figure it out on their own. This approach allows the student's learning process to be filled with them asking their own questions, then investigating their own questions, effectively leading to further experimentation and hypothesis. Throughout this process the students discussed amongst each other and supported each other. This approach created an open environment, where students were more excited to learn than if it had been a traditional style of teaching.

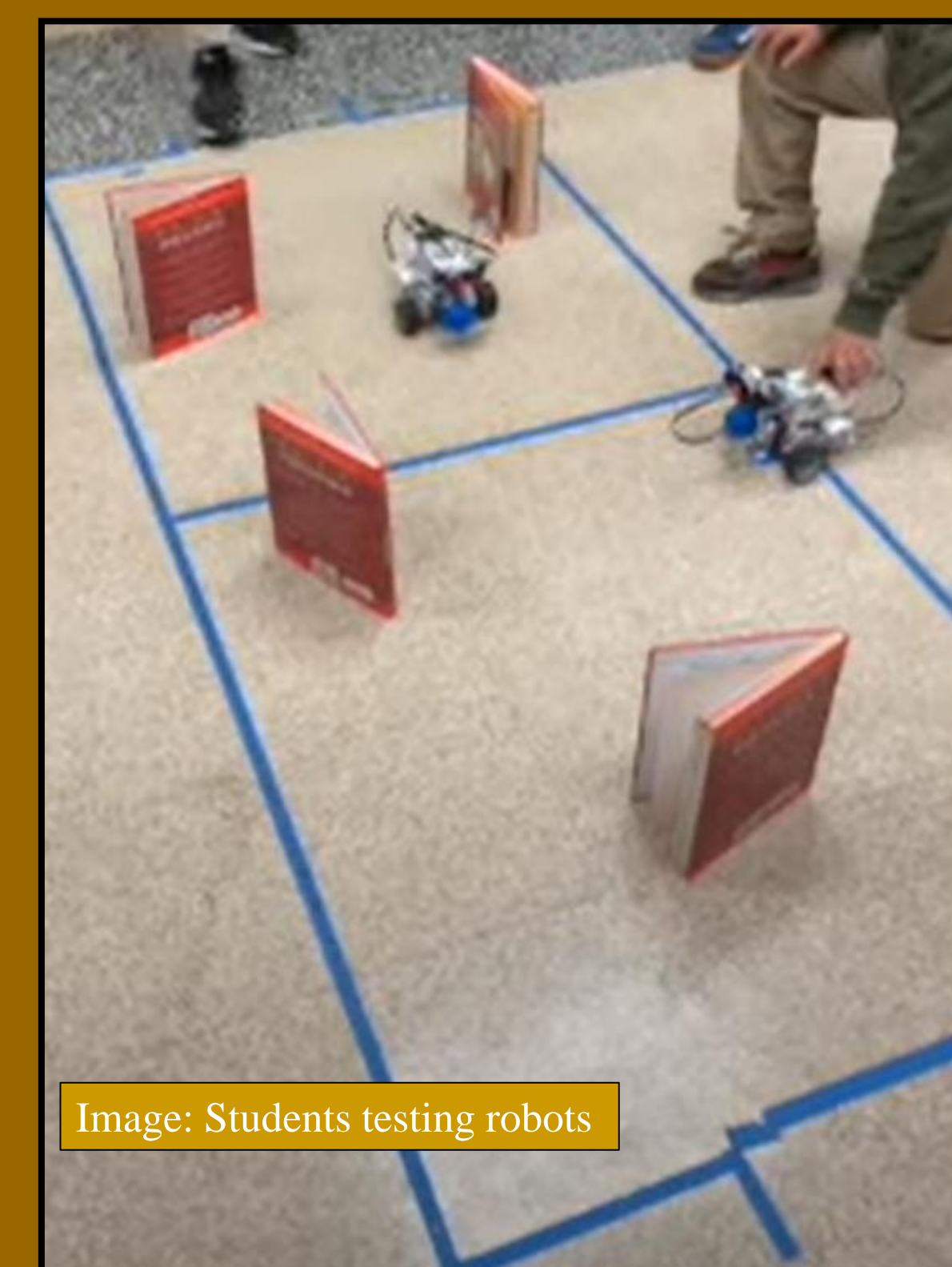


Image: Students testing robots



I would like to thank our course teacher Vivian Zohery, our on-site coordinator Teresita Rolon, STSS director David Tomblin, the students, and our team: Nam Facchetti, Declan Tilton, Jake Riddle, and Jason Usatine for all the great work and this enlightening experience. I would also like to thank Dr. Holtz and Dr. Merck for the past two years of guidance and generosity

