

PROMOTING STEM GROWTH THROUGH ROBOTICS LEARNING



College Park Scholars – Science & Global Change Program
Information Science
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CPSS240
College Park Scholars Academic Showcase, May 3, 2024

INTRODUCTION

For my practicum project, I took the course CPSS240, where our goal was to help inspire and educate young students about the field of STEM. Through a hands-on, service-learning approach, we were able to gain valuable experience in teaching robotics to their younger peers. Our goal was to not only provide a fun and engaging learning environment, but also to cultivate a passion for technology, innovation, and collaboration in the next generation.

SITE INFORMATION

College Park Academy
5751 Rivertech Ct, Riverdale Park, MD 20737
Dr. Kuan-Hung Lo
Our mission was to use Lego Education Mindstorm EV3 Robotics kits to develop a robotics curriculum, to lead and participate in after school robotics clubs at different elementary, middle and high schools in Prince George's County.

PURPOSE

The purpose of this project is multifaceted, focusing on fostering various forms of capital, promoting volunteerism, and enhancing cognitive development of the adolescent mind. Moreover, the project aims to stimulate the cognitive development of both the participating students and the children they teach, encouraging critical thinking, problem-solving, and adaptability through a hands-on robotics curriculum.

LESSON PLANS

We had a 9-week lesson plan that was designed to gradually introduce students to the world of robotics, building their knowledge and skills in a structured and engaging manner. Each week covered a different topic, starting with the basics of robotics and progressing to more advanced concepts. Topics include an introduction to the LEGO set, how each motor operates, how each sensor operates, and how to use EV3 Classroom in order to utilize these components. Through this curriculum, students were able to gain a solid foundation in robotics and develop the confidence to explore more complex topics in the future.



Our EV3 Mindstorm kits

OUR GRAND CHALLENGE PROJECT

The grand challenge project is an integral part of our program, offering students the opportunity to put their acquired knowledge and skills to the test. In this project, students are tasked with designing a maze and programming their robots to navigate through it using sensors. The process encourages teamwork, collaboration, and creative problem-solving as students share ideas and assist one another in troubleshooting and coding. This hands-on, collaborative experience not only reinforces their understanding of robotics concepts but also fosters important social and communication skills essential for their future endeavors. The grand challenge project serves as a culmination of the 9-week lesson plan and a testament to the students' growth and accomplishments throughout the program.



Our video of our grand challenge!



DISCUSSION + IMPACT

The service-learning work has made a significant impact on the cognitive, social, and emotional development of the participating students and the community they serve. By engaging in teaching robotics, adolescents enhance their problem-solving, communication, and leadership skills, while also promoting empathy and responsibility. This program fosters a culture of collaboration, innovation, and lifelong learning that benefits both participants and recipients.

CHALLENGES FACED

Throughout the program, we encountered challenges in ensuring student engagement and facilitating effective peer-to-peer support. Maintaining student interest and motivation required continuous effort and creativity, especially when dealing with complex robotics concepts. Additionally, we had to navigate the varying skill levels and experiences among participants to create an environment where more experienced students could help their peers.

