Learning Debugging skills through mBot Mega

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DESCRIPTION OF TAP PROGRAM

The Technology Ambassador Program (TAP) at GGC strives to break the misconceptions of the IT field by providing workshops for students of all backgrounds. TAP students design engaging and fun outreach workshops to encourage interest in IT and STEM.

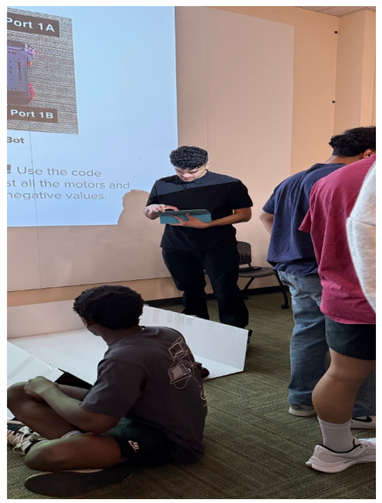
PROJECT GOAL

The study is geared towards promoting IT to students of any level. This is accomplished by teaching what debugging is by allowing students to program through the mBot Mega and letting participants debug the mBot Mega themselves with pre-loaded and incorrect block-based coding.

PROJECT DESCRIPTION

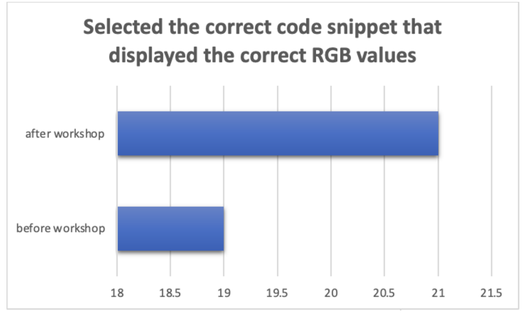
- For this project, we split into 3 groups to teach different aspects of the mBot Mega (Speed, Turning, and RGB lighting.)
- Using the mBlock app, we taught the participants how to program each aspect and how to fix any bugs.
- They were then handed iPads with pre-loaded block coding that had bugs and they had to fix it to navigate a track

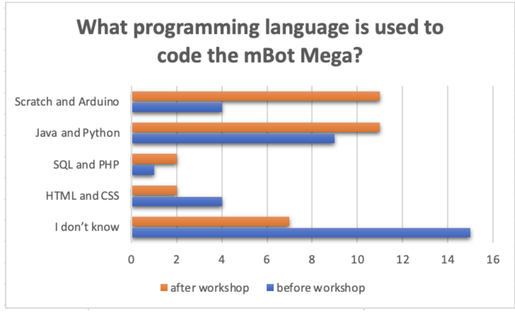
OUTREACH EVENTS

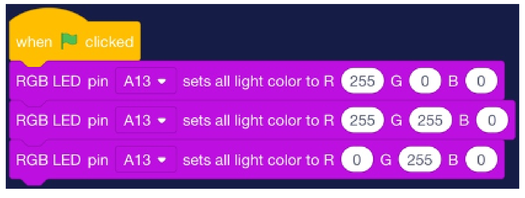


- TAP expo: more of a demo, letting participants play with mBots with an introduction of our concept.
- Classroom workshops: We did **3** workshops. More in-depth teaching of the debugging concepts using the mBots with an introduction to the TAP program to **47** participants.
- Taught basic coding skills on how to maneuver the mBots and how to debug them through block-based coding.
- We conducted our results through a pre and post survey.
- Of the **47** participants, **35** answered both the pre and post survey.

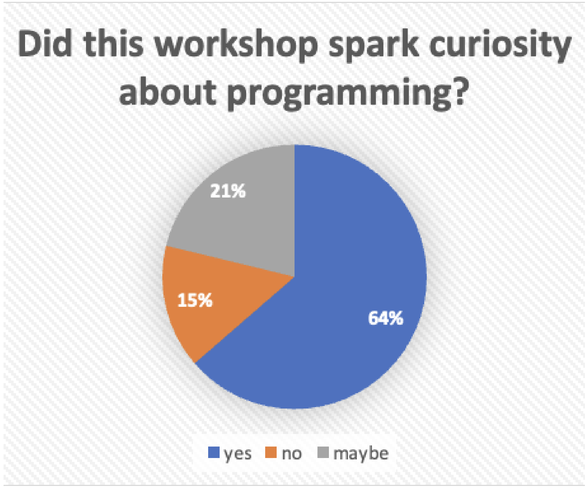
WORKSHOP RESULTS







Correct Answer



- **97%** of participants understood why it is important to test their program after the workshop.
- There was a **26%** difference in participants who knew what the mBot Mega motors are for.
- **27** of **33** participants enjoyed learning the technology from our workshop.
- **29** of **33** participants enjoyed using the technology in the workshop.

REFERENCES

- Dekhane, S., Xu, X., Napier, N., Barakat, R., Gunay, C., & Nagel, K. (2018).*Technology focused service-learning course to increase confidence and persistence in computing.Journal of Computing Sciences in Colleges, 34*(2), 147–153.
- Makeblock. 2025. mBlock. Retrieved February 25, 2025, fromhttps://ide.mblock.cc/

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