Using Virtual Reality to Teach the Fundamentals of Programming

Connor Murdock, Alan Oliver, David Torres, Tylor Rowe, Dr. Cengiz Gunay, Dr. Rahaf Barakat

WHAT IS TAP?

The Technology Ambassadors Program(TAP) is designed to get more people interested in the field of Science Technology Engineering and Math (STEM) through the creation of Projects to teach not-tech students' useful skills in a fun way.

WORKSHOPS AND OUTREACH EVENTS

- Tap Expo - During the Tap Expo event we showcased our demo projects to students and gathered some feedback to implement into the last phase. Students loved the concept!

- Tap Expo online - Online version of Tap expo where we showcased our PC version of the VR game. Gathered feedback to add in the last phase

- Workshops

- Women in Technology
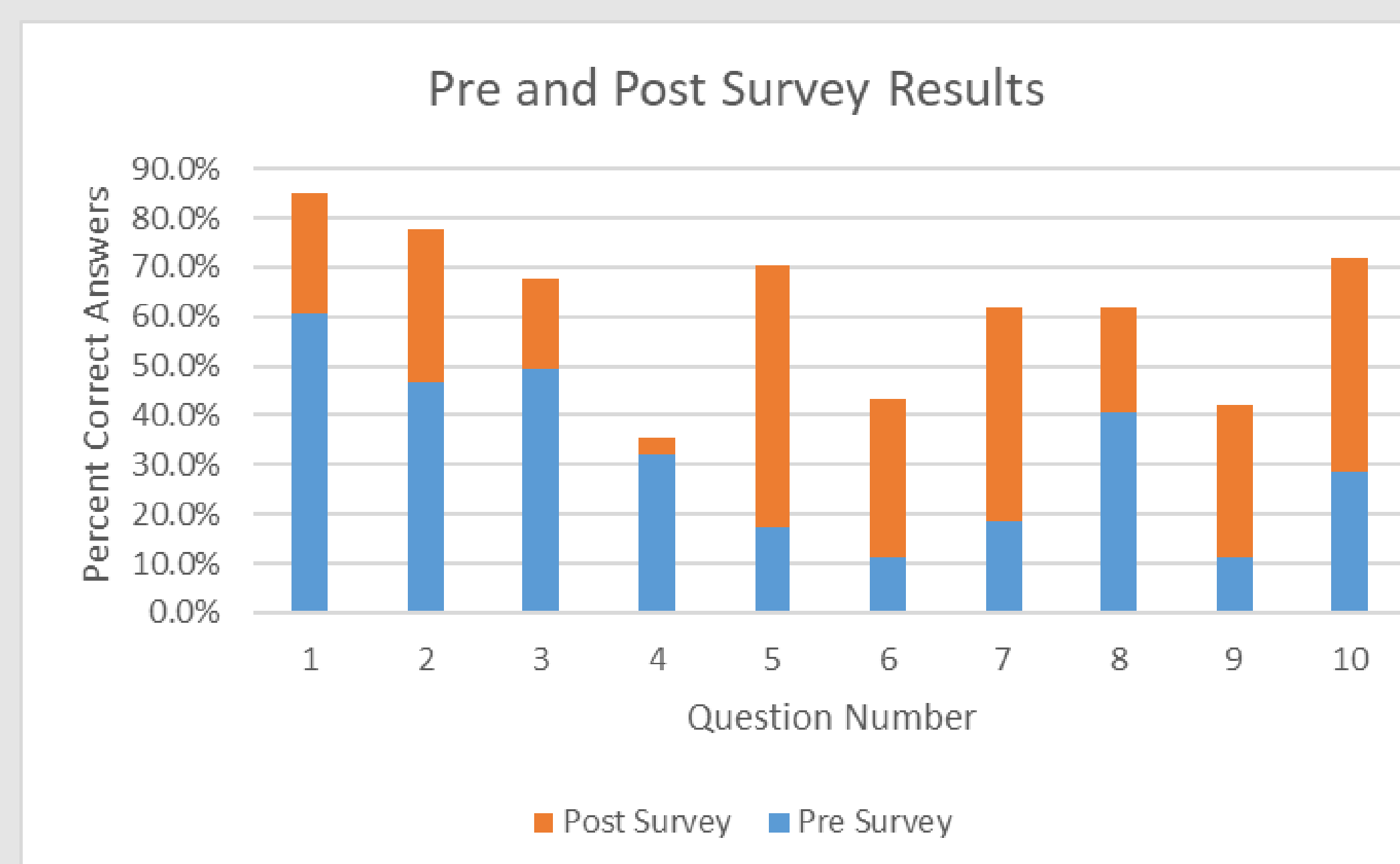
- Super Saturday

- Spanish School

PROJECT GOALS

- We want to show people that programming is easier than most people believe.
- In our workshops we will teach students about Python programming and programming languages that can create games
- We will teach students the fundamentals of programming such as:
  - data types
  - how to assign values to variables
  - how to read and understand various if statements.
- The goal of the project, is to give the player a physical feeling of programming rather than visualizing it.

RESULTS

We had a total of four workshops and the results were promising. We saw an overall average of 30.53% increase in correct answers. The largest increase in correct answers from pre to post survey was 68.42% while the smallest increase was -6.70%. There was a decrease across the board of "I don't know" responses on every question

Pre and Post Survey Results

Q1. What is the correct value of X to make the following if statement true: Y = 13 X = ___ if x == 20
Q2. Choose the correct value X to make the following if statement true: Y = 5+6 X = ____ If x == 25
Q3. Choose the correct value of X to make the following if statement true: Y = 5 X = ___ If Y>X
Q4. Select the correct value of Y to make the following if statement true: X = "Moon" Y = ____ If y == "MoonMoonMoon"
Q5. Which of the following option is a String value?
Q6. Can you add a String value and a float value together? example: "peach" + 3.5
Q7. Which of the following is a float value?
Q8. Can you compare more than two variables using an if-statement?
Q9. Can you multiply a String value and a float value together? Example: "peach" * 3.5
Q10. Can you add an Integer value and a float value together? Example: 3 + 3.5

TECHNOLOGIES USED

- **Virtual Reality** is a computer-generated simulation of a three-dimensional image or environment that can be interacted with a headset or other devices. It was used in tandem with Unity Game Engine to create a game to teach participants about fundamentals of programming within the Python Programming Language. A WebGL version was co-developed for those who are uncomfortable with VR.
- **Technologies:**
- Oculus Quest VR Headset and Controllers
- Unity Game Engine
- WebGL
- Python Programming Language

TRY THE GAME!