Applying an interactive learning style to teach Programming Fundamentals through a familiar activity

Information technology is the fastest growing industry reaching throughout all fields of study. Gathering information and knowledge is essential for an organization to succeed. Using the gathered knowledge, an organization can apply and adapt to the fast-paced internet-based society. Whether an organization is able to effectively use this data will either make or break them. The main boundary potential Information Technology students face is a belief that programming is an incredibly difficult skill to learn. This misconception is perpetuated by movies and other forms of media displaying programming as a "how fast can you type" simulator, however in reality programming is a methodical process to achieve a result, which is what led us to the idea of using a sport to teach programming. We believe that using a device such as Sphero will help to break down their misconceptions and will facilitate faster learning. We are using Sphero as a tool to teach basic programming concepts to students of varying technological expertise. Sphero is a programmable robot with both a text based and block based interface. When learning something new it is helpful to have something known, so we are using Sphero to create a familiar environment to learn programming. By emulating a sport, in this case basketball, we are providing a physical context for our activities. We are enrolled in the technology ambassador program (TAP) with the goal to develop this interactive workshop. TAP will provide us with the necessary tools to build the obstacle course and resources (Spheros) in order to develop our interactive workshop along with mentoring to ensure the best possible outcome for the study. The demonstrations will take place in a classroom setting. We will introduce our sphero workshop with a brief PowerPoint presentation and a showing of sphero's capabilities in a controlled demonstration. Students will have the task of navigating the sphero

through a basketball themed obstacle course. The students will complete various basketball "drills" like driving through cones, following patterns, and "scoring a goal" throughout the course. TAP members leading the study will split up to assist the groups in the challenge.

We will add a competitive edge by allowing students to compete for the fastest time navigating through the course. We will conduct a small assessment of their programming knowledge before and after the workshop as well as a survey based on the course's shortcomings and its strengths. We will use the data obtained from these assessments to visualize any improvements the students achieved. The surveys will be used to fine tune our workshop routine, measure whether we were effective in reaching our goal, and to further streamline the learning process. We will be running this workshop mainly to direct college students towards STEM classes, however we will have participants ranging from middle school through college age. We will create different tasks for different age levels so that all participants can remain engaged and encouraged to participate. With all age groups we will use the block based interface provided by Sphero the difference between the groups will come from content. With the college students we plan on teaching them the meaning of the major basic programming concepts: loops, if-statements, and functions. With the younger groups we will focus more on giving them exposure to the technology, and a general understanding of what coding is. Following our collection of data from the surveys,. Our goal is that after our activity the students will develop an interest in STEM fields while learning basic programming concepts. We want the activity to show students the interactive side of programming and some of its capabilities. Beyond the workshops and lessons we hope to prove that the addition of interactive lessons in beginner level courses can solidify basic concepts of the subject matter at hand.