**Name(s)**

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**Project Number**

# S0413

**Project Title**

## Using Mobile Technology to Aid Those Afflicted by Color Vision Deficiency

**Abstract**

**Objectives/Goals**

The goal of our project was to develop a mobile application that aids color vision deficient people in identifying colors and helps children learn color vocabulary.

**Methods/Materials**

There were four phases of this project: storyboarding, building, testing, and data analysis. We developed the application using HTML5, JavaScript, and CSS3. We also used Phonegap, Dojox, iScroll5, and Node.js, which are open source JavaScript libraries. We created the application in the Android Studio workspace. Once the application was laid out, arrays of 133 Crayola crayon colors, 1,438 Sherwin-Williams paint colors, and 1,341 Pantone C colors were used in the Identify tab of the application and an array of ten basic colors was used in the Game tab of the application. We tested our application on five color vision deficient people and five normal color vision people by having them attempt to determine which of two Crayola crayons best matched a solid-colored piece of paper. Each test subject was tested ten times: five times without the application and five times with the application.

**Results**

The chi-square of the data collected from the color vision deficient test subjects was 2.3969 and the p value of the t-test of that data was 1. The chi-square of the data collected from the normal color vision test subjects was 1.1024 and the p value of the t-test of that data was 0.3052.

**Conclusions/Discussion**

From the chi-squares and the p values of the t-tests, no significant improvement could be shown when the test subjects used the application, meaning that neither the null nor the alternative hypothesis could be accepted. We concluded that natural lighting dramatically increased the accuracy of the test subjects# ability to identify colors.

**Summary Statement**

The goal of our project is to improve the lives of color vision deficient people and provide a color-teaching tool for children through mobile technology.

**Help Received**

Father helped answer questions when we ran into coding errors we were unable to solve.