Middle School Outreach Program to Teach Programming Concepts with Mobile Application

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Abstract

We are developing a prototype for a learning system, which might boosts students' curiosity in mobile app programming career. We have developed an after-school outreach program to customize an Android app. We believe the more involved the students are in customizing the app and sharing their achievement with their social network, the more curious they will be toward mobile app programming career. The students' experience with the Android app will be measured via textual data on how they developed code; test data from multiple-choice questions; and descriptive text uploaded to Facebook. We are interested in investigating the following hypotheses in a case-control study: if students in the case (the intervention) group will be (1) aware of programming concepts; (2) interested to learn more; and (3) sharing what they learned with their social network.

Recently, we conducted our first study with 28 middle school students to test our prototype. We explored logistic matters, and developed syllabus, course, and survey forms. The students' curiosity in mobile app programming appeared to have boosted as their six-week course proceeded and as demonstrated by the post-survey in contrast to the pre-survey. To allow the middle school students to customize an app that was initially developed by undergraduate students, we taught the students basic programming skills. We enhanced the app to allow the students to create their profile using the Processing programming language. In addition, we integrated the app with Facebook, so the students can share their activities on the app with their social network. We plan to include students from both STEM and non-STEM programs in a future case and control groups, totaling approximately 40 students from 6th to 8th grade. We will utilize machine-learning algorithm to analyze the data that will be collected from the students' activity.