Novel Approaches to CS 0 with App Inventor for Android

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Categories and Subject Descriptors
K.3.2 [Computers and Education]: Computer and Information Science Education.

General Terms
Human Factors, Languages

Keywords
CS 0, education, introductory computer science, mobile application development, visual programming environments, social aspects

1. SUMMARY
Google's App Inventor for Android (AIA) is a visual programming environment for creating mobile phone applications that is designed to be accessible and appealing to college non-majors taking introductory courses in computer science. Specifically, AIA provides a development environment similar to StarLogo TNG [7], Scratch [5], and Alice [2] but enabling users to create mobile applications incorporating social networking, location awareness, and Web-based services for Google's Android platform [1].

Faculty at twelve different colleges and universities used AIA in a wide range of introductory computer science courses for non-majors in the fall of 2009. After a short visual introduction to AIA, panelists from four of these schools will present:

- their different curricular approaches
- ways in which AIA was successful or unsuccessful in helping them meet their educational goals
- projects created by their students
- what they learned from their experiences that can be applied to other introductory computer science courses
- whether AIA was effective in interesting students who would otherwise not take computer science courses
- results of pre- and post-surveys of the students

2. POSITIONS
2.1 Mark L. Chang, Olin College
Mark L. Chang, Lynn Andrea Stein, and Mark Sheldon delivered a collaborative, student-led first experience course designed to engage non-programming-oriented students in developing applications for mobile devices. The goal for the course was to observe how the different contexts of the participating students affected their design of mobile applications, as well as how having a tool that eases the learning curve empowers students and engages them in the creative process of building applications. From this, they hoped to be able to design a new set of tools and interfaces that not only eased the mechanics of development, but adequately captured the creative input of individuals who do not necessarily think in terms of code.

Students with existing experience developing for the Android platform were selected to lead a four-week mini-course. The students in the mini-course took part in a lightweight design exercise that involved paper prototyping and scenario sketching to fuel the brainstorming process. After candidate applications were proposed, the student mentors led technical sessions that introduced the students to the AIA programming environment with the goal of developing at least some part of their initial applications.

2.2 Paul Gestwicki, Ball State University
Paul Gestwicki modified his existing Visual Programming course to use AIA. The course introduces the basics of computing to non-majors through the development of graphical user-interfaces, conventionally using Microsoft VisualStudio to write Windows applications. Using AIA allowed students to work in the even more compelling domain of mobile smart phone applications.

The experimental section used AIA in the context of studio-based learning (SBL), a pedagogic approach that is characterized by representation construction, presentation, and discussion [3]. Specifically, the students created their own Android applications and presented these for discussion to both peers and instructors.

Gestwicki hypothesized that the combination of AIA and SBL would result in high student motivation and positive attitudes towards computing, which he formally evaluated using qualitative research methods and the Motivated Strategies for Learning Questionnaire [6].
2.3 Ellen Spertus, Mills College
Ellen Spertus taught a course at Mills, a women's liberal arts college, entitled “Technology for a Better World”, in which she invited students to look beyond the applications of information and communication technology (ICT) to education and commerce that students were most familiar with and to consider ways in which ICT has changed and will continue to change life for relatively disempowered people, such as the use of Twitter in the aftermath of the Iranian elections, the One Laptop Per Child initiative, and how ICT is driving economic development at the bottom of the ladder, such as through enabling micro-finance and increasing the availability of pricing information [3]. Spertus chose this approach because of her own interest in the subject and because of her belief it would appeal to Mills students, known for their political activism and concern for social justice.

In addition to incremental reading, writing, debating, and lab assignments, students were assigned a final project in which to design, prototype, and present an Android application to empower, and not just to entertain, its target audience.

Spertus was also a developer of AIA while employed by Google full-time while on leave from Mills College and part-time while teaching the course.

2.4 David Wolber, University of San Francisco
David Wolber of the University of San Francisco taught a special section of a CS0 course entitled “Robots, Computing, and the Web” using Android phones as the “robots” and AIA as the programming environment. He hypothesized that students would be especially motivated to learn programming if they were able to build applications that they and others might actually use on their most used computing devices.

In lab, students learned programming concepts and problem solving through the development of simple games and convenience applications. They were also assigned readings and blog responses focusing on how mobile and cloud computing is changing society. Their final project was to design and build a mobile application that helped someone.

3. REFERENCES