Cell Phone Programming in the High School CS Program: Starring: App Inventor

Presented at: MIT Center for Mobile Learning
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Life at AMSA Charter School

- Where is the C in STEM?
  - At the Advanced Math & Science Academy Charter School
    - Computer Science is a discipline
  - All students in Grades 6 – 12 are required to take Computer Science every year
Our Course:

- Started in September 2010 – January 2011
- Required – all students must enroll in Computer Science
- 11th Grade Java Intro/Review
- Cell Phone Programming Using the Android SDK and Eclipse
- Diverse class make-up
Our Course became:

- Intro to Java / Using Eclipse IDE
- Cell Phone Programming using App Inventor
Typical Java Assessments

- Update an existing Method of a given class
- Create a Driver Class, given a template
- Used OWL
- Analyze/Create an if/else construct, loops
- Tests and Projects
- Most kids enjoyed the using the java swing library for input and output
- Some kids hated the Java Language syntax
Introducing App Inventor

- Began to work with App Inventor in December 2010
- Students were quite excited and some elated to leave Eclipse
- “Are we really going to create an app?”
- Used the tutorials from Google and teaching material with permission of David Wolber, USF Professor
Logistics:

- Created 26 student gmail accounts used across all 4 sections
- Students shared accounts
- Installed AppInventor library using Setup Instructions on appinventor.googlelabs.com
- Quite a Beta Experience
- Used Forums for support and UML CS Professor Fred Martin for troubleshooting lab issues
Tutorial Labs

- PurrCat, MoleMash, PaintPot, Quiz Builder
- Xylophone, Where’s My Car?
- Paris Map Tour
30 girls attended the Technovation for 10 weeks and acquired the top two positions in the challenge.

Students were exposed to the project based learning.

We realized the effect of PBL was so profound we changed our assessment for the next semester.

The total experience for each student was invaluable.
Project Rubric

Production Submission

- At the end of your last class you will turn in the following items:
  - 1. Final Production Journal (**30pts**)
  - 2. Final Game Design Document (**40pts**)
  - 3. Game Source Files (**60pts**)

Game Requirements
- **Design Components**
  - 2 Screens: Start & Game
  - 2 Sprites
  - 2 Sounds
  - Tutorial Text (instructions on how to play your game)
  - Game over or Win text

- **Logic Components**
  - 2 Procedures
  - 1 Clock
  - 2 Variables
  - 2 Controls (if, ifelse, etc…)
  - Win conditions & lose conditions (or scoring system)

**NOTE:** Each component must have a place in your game logic. AKA, adding the blocks without real functionality will not count.
What AppInventor teaches Kids?

- Fundamental skills of developing an App
- Hones basic problem solving skills
- Complete project development cycle: design, build, test and debug
- Students understand algorithms, event handling, control structures
- Basic programming concepts can be introduced for any level student
Positive experiences

- Students were able to see results very quickly
- Lot of excitement surrounding the creation of the app
- Students struggling with Java were able to pick up and run with AppInventor
- Made CS accessible for low level learners too
- Does engage both genders equally – although types of apps developed by them were completely different
Negative

- Some students knowing Java felt that it dumbed down CS
- Some blocks were a bit confusing – Like for loop block
- Somewhat restricting
- Still in development
Plans for next year

- Map the course to the National CSTA standards
Remarks
- It is an effective way of giving practical and hands-on CS application
- App Inventor easily accessible to all students
- Sharing their work has never been easy – since most of them use smart phones

Questions