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

Technovation Challenge- Spring 2012

- 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)**
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- **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

Closing

- 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