

# Panel: Mobile Application Development in Computing Curricula

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## 1. SUMMARY

Mobile application development is a hot topic that has great appeal to computing students. Harnessing this popularity is important to our programs to help attract new majors, retain those we have and to generally motivate learning. Many institutions are considering offering a course on mobile application development. Some already have.

It is time to begin a discussion about developing mobile applications in our curricula. Where does it belong? Does it belong? What are some of the challenges and risks in creating a mobile application development course and how do we mitigate them? What other potential offerings are there? Can it be used to attract non-majors into the major?

The panelists below present four experiences in teaching a course in mobile application development. They will share their experiences and help start the discussion about mobile application development in our curricula. In the first half of the session, each panelist will present their experience including: an overview of their course; its audience, position in the curriculum, and prerequisites; the platform, language, and development environment used; positives about the course; and roadblocks and negatives about the course. This explanation will provide the foundation for the second half of the session, which will involve audience discussion of the questions identified above.

## 2. STONEY JACKSON

**Industry Partners:** In addition to being attractive to students, mobile applications have the benefit of relatively easy deployment and broad accessibility to a range of users. It is not surprising that many businesses are strongly focusing on mobile apps to reach their customers and to support their business goals. However, mobile application development faces the challenge of developing for a rapidly evolving technology resulting in problems of version control, backwards and forward compatibility, maintenance, and more.

The Mobile Application Development course offered at Western New England University focuses on the development and

maintenance of real-world mobile applications. The use of real-world applications allows students to become self-directed learners within a professional environment while understanding development for mobile devices under real world constraints and requirements. Students developed or enhanced two main applications. The WNE Mobile application is aimed at WNE students, and provides students with access to course schedules, library, professor information, and more. In addition, Financial Partners Inc. provided an application for supporting loan initiation for farm credit bureau representatives working with agricultural business folks in the field. This application was developed from requirements defined by FPI and with direct input and oversight from FPI.

Both projects were developed for the Android platform and written in Java using the Eclipse development environment. This course was offered as an elective for upper division Computer Science and Information Technology majors. Students were required to have completed an introductory course in programming in Java.

## 3. STAN KURKOVSKY

**Mobile Games:** Computer games gained a wide acceptance as an engaging and motivating tool in the CS curriculum. However, designing and implementing a playable game is a very challenging task and is best implemented in advanced courses where students already have a sufficient experience in software development and exposure to other CS topics. Mobile games offer an advantage of being simpler by nature and thus easier to program. This makes it more feasible to lower-level students to develop playable games as a part of their classroom experience.

Mobile applications are often easy for students to relate to, because mobile technology plays an increasingly important role in the lives of today's students. For many of them, their mobile phone is replacing a desktop computer as their primary computing device. Mobile applications and games offer instant gratification in the sense that students can download them to their mobile phones almost immediately and show them off to their friends. In our approach, we strive to make connections to advanced CS topics as early in the curriculum as possible. By exposing students to a wide range of advanced CS topics early in their academic career, our approach aims to show students that CS can be much more exciting than coding and that there are so many areas in which programming plays a supplementary role.

This approach has been applied in two separate instances, as a standalone course and as a set of curricular modules. An Introduction to Mobile game Development course has been offered at Central Connecticut State University for the three three years. CS I is the only prerequisite for this course, which makes it open to any student with basic knowledge of Java. This course uses Java 2 Mobile Edition (J2ME), which can be installed on any platform. J2ME applications are typically developed in an emulator, but then can be transferred to a mobile device. In parallel with the course, we developed a number of learning

modules leveraging the engaging and motivational nature of mobile game development. Each module focuses on a mobile implementation of a single casual game (e.g. Frogger or Battleship) to reinforce a core programming topic (e.g. loops or arrays) and introduce students to an advance area of CS (e.g. computer networking or databases).

#### 4. ENI MUSTAFARAJ

**Attracting students to programming:** The generation of current students grew up with iPods and Facebook. Mobile devices and access to the Internet are the most natural aspect of their everyday life. With the widespread adoption of smartphones and tablets, which are very powerful generic computing devices, it is only natural to think of how to leverage their appeal into attracting more students (especially minorities) into programming and Computer Science. However, developing mobile applications with the current technologies requires that students have already completed at least two CS courses in programming. Can we make programming mobile apps attractive and easy for non-programmers? It turns out that we can, with the new visual programming environment, App Inventor for Android, that uses the blocks-language technology underlying another popular platform, Scratch. With App Inventor it is simple to create functional apps in a matter of minutes. This is made possible by a built-in library of powerful components that simplify the interface design and behavior programming through event-handlers. In fact, because it is so easy to build interesting apps, very soon students embark in very ambitious projects. App Inventor has been recently open-sourced and this creates new opportunities for educators and hobbyists to develop new libraries that will simplify access to more sophisticated features of the Android SDK. This means that App Inventor can be used both as a platform for non-programmers, and as an open-source project in which advanced

CS students can make their contribution, with the goal to make programming more accessible to everyone.

#### 5. LORI POSTNER

**Retention:** One challenge of teaching in a community college is retaining students through graduation. Many students take Computer Science I and II and then transfer to a four-year institution. In an effort to encourage students to complete their CS degree at Nassau Community College, we created a mobile application development course as a 2nd year elective. From an educational point of view, developing mobile applications provides students with a new perspective on program design and efficiency. It provides a context for discussing topics such as threads, real time applications, databases, and user interface design. From a motivational perspective, students are thoroughly engaged. The ability to put a program they created on their phone or tablet and show it to their friends makes students want to go above and beyond the basics.

The Mobile Application Development course at NCC was offered for the first time Fall 2011 and has run each semester since. Our CS I/CS II sequence is taught in Java using the Eclipse programming environment. To leverage off students' prior knowledge, the course teaches Android application development allowing us to continue with Java and Eclipse. The energy and enthusiasm of the students in the course is unparalleled in any other course I've taught. The students have become part of the learning process. They research ideas and contribute solutions to the class. Not only are they learning an emerging technology, they are able to witness, first hand, the endless possibilities that CS as a discipline provides. Although it is too early to know how the course will affect our retention efforts, it certainly looks promising.