Design, Development, and Empowerment:
My Experiences of Coaching a Best-in-Nation
Middle School Team from
2014 Verizon Innovative App Challenge

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Abstract

During the presentation, I will share how I supported a national-winning team of middle school students to develop their STEM-related mobile app through on-site training and other virtual scaffolding mechanism. I will discuss the tips, challenges, and lessons learned based on my reflection as a computing educator. This presentation should provide practical information that can be applied to other contexts of computing education as it involves various aspects that are commonly relevant, such as project management, communication, and technical consideration during app development. I hope my sharing of the rewarding experiences with the community can help encourage more quality educators and App Inventor enthusiasts to consider applying to join App Inventor Training Corp. (AITC), and serve the common goals of contributing to computing education through this venue. (Learn more about: 2014 Verizon Innovative App Challenge at http://appchallenge.tsaweb.org/)

1. Verizon Innovative App Challenge (VIAC)

In 2014, Verizon Foundation and Technology Student Association collaborated to host the second Verizon App Design Challenge. This event provided opportunities for middle school and high school students (each in a team of 5 to 7 members) to integrate their STEM knowledge and creativity to develop mobile app concept (demonstrated through a visual presentation accompanied by an essay) that can help address the needs of their community and/or school. In Phase 1, each team competed for the spot of "Best in State" winner—one for middle school and one for high school per state (50 winners for middle school and 50 winners fro high school in total). In Phase 2, the Best-in-State winners competed for one of the spots of "Best in Region". There were 12 Best-in-Region winners in the middle-school category and 12 in the high-school category. In the final stage, a panel of STEM educators and corporate innovators selected 4 Best-in-Nation winners in the middle-school category and 4 in the high-school category respectively. Each of the winning teams was paired and work with a coach from App Inventor

Training Corp. organized by the MIT Center for Mobile Learning @ the Media Lab to make their app concept come true. The winning teams then traveled with the faculty advisors from their schools to present their completed mobile app at the National Technology Student Association Conference.

2. App Inventor Training Corp. (AITC)

MIT Center for Mobile Learning has worked with Verizon Foundation since 2013 to form App Inventor Training Corp. and sought for educators who have significant skills with App Inventor and demonstrate experiences of working with students. In 2014, I was selected as one of three new members to join the AITC, and had the opportunity working with one of the 8 national winning teams from 2014 VIAC. The AITC members met at Massachusetts Institute of Technology to prepare training materials for the national winning teams. The AITC members also shared experiences and exchanged ideas of teaching and facilitating mobile app design. The two-day intensive meetings were very helpful even for experienced educators because various contexts and situations (resources, formats of coaching, project management etc.) were covered.

3. Onsite Training

The scheduled onsite training last for three days, including travel time. Each AITC coach was paired with a team as geographically close his/her home city as possible. This helps save coach's travel time, which means possibly more time for training and other preparation (e.g., resolving technical issues and testing infrastructure). I worked with a talented and dedicated team of middle school students in northwestern U.S. The team's faculty advisor is also attentive and accommodated my suggestions as much as possible to ensure effective and efficient training.

My onsite visit and training is successful, which could be attributed to the following factors:
- Respect students' schedule and find the best 3-day schedule for the training.
- Bring my own devices and mobile hotspot: Things can go wrong sometimes. In the context of app design training, it can mean issues with mobile device specs and buggy WI-FI connection, despite all good intention and preparation by the school's technical staff.
- Contextualize the training in the team's app ideas: Focus on the App Inventor features and functions they would use for developing their app based on their winning concept and ideas.
- Engage the students with some fun and achievable challenges in programming, such as "build a text-to-speech app that requires only three blocks in one minute."

4. Follow-up Support

It is important to model the project management and provide some scaffolding/structure to ensure smooth communication among team members, faculty advisor, and the coach. It is helpful to facilitate the work distribution among the team members, based on what the coach learned about each member's interests and dedication. It is also helpful that the team selected one responsible/dedicated project manager because this member can coordinate the project within his/her team and streamline the communication with the

coach. In some teams, students take non-overlapping roles such as graphic designer, interface designer, or programmer. In the team I worked with, each member wanted to do the programming (because it's fun!)—each of them took on the programming and design of a different screen/function. They assumed multiple roles in their project and sought for help from each other as well as the coach when needed. The faculty advisor is crucial, too. It is always a good idea to involve and copy the advisor during the communication because the advisor can step in when the team needs to catch up on their schedule or communication. It is also a good idea to request for weekly update on development progress and source code, which can help the team stay on schedule and back up the code weekly (if there is progress on programming side). While virtual meetings were provided as an option, the team seemed to work fine with asynchronous communication with me and did not request for virtual web-conferencing when seeking for help on programming their app.

5. Challenges

The successful onsite training does not go without challenges. As I mentioned earlier, the supposed-to-be working mobile devices might not connect with the App Inventor, which can be caused by unstable or overloaded WI-FI network. It is understandable that each school might not have sufficient devices for one-to-one development and practice. In most cases, the emulator is reliable and can be used to test most, if not, all apps under development. However, there can sometimes be issues with installation and specs limitation on the computers running App Inventor. It is always a good idea for the coach to bring his/her own devices to the extent possible. In terms of WI-FI network, the school's WI-FI does not allow the mobile devices to connect with App Inventor via the "MIT AI2 Companion" app. Fortunately, the experienced technical staff at the school prepared a mobile hotspot that worked flawlessly. However, the hotspot was limited up to 5 devices, including both working laptops and the actual mobile devices for testing the apps. This means students need to work in pairs or groups so that the number of devices would not exceed the hotspot limitation, and I as the coach would not be able to use the mobile hotspot at all. Fortunately, I also prepared my own mobile hotspot which allows me to demonstrate some app development or test students' work concurrently while they were practicing on their laptops and mobile devices.

6. Conclusion

I am fortunate to work with other AITC members, and had the pleasure to coach one of the best-in-nation teams from the 2014 Verizon Innovative App Challenge. Through the process, I learned that it is important to always over-prepare and have multiple alternative plans throughout the onsite training and follow-up support. I hope this presentation can help provide practical information that can be applied to other contexts of computing education as it involves various aspects that are commonly relevant, such as project management, communication, and technical consideration during app development.