

Pioneering Extension Nutrition Education with iPad Apps: A Development Story

Abstract

Technology can be an effective vehicle for Extension nutrition education. Body Quest: Food of the Warrior is a childhood obesity prevention initiative of the Alabama Cooperative Extension System that successfully incorporates technology in the classroom. With Body Quest, students learn about healthful eating through blended learning involving both classroom instruction and self-directed e-learning via apps. Seven iPad apps excite students and engage them in the learning process. Extension professionals can benefit from our lessons learned for creating a successful app.

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Introduction

Computers, tablets, smart boards, apps, and other e-learning tools are increasingly commonplace in the learning environment (McKnight et al., 2016). Moreover, interactivity in place of passive learning is important to the learning process in health promotion and nutrition education (Baranowski & Frankel, 2012; Case, Cluskey, & Hino, 2011). Body Quest: Food of the Warrior, an Alabama Extension childhood obesity prevention initiative, addresses this modern-day issue through a blended learning approach (Struempfer, Parmer, & Funderburk, 2016). Body Quest alternates a traditional classroom-based, educator-led instruction model with self-directed e-learning via apps to engage children in learning about nutrition.

iPads and App Development

To incorporate technology into Body Quest classroom learning, we determined that the technology would need to

- reinforce Body Quest curriculum content;
- involve hardware that would be easy to maintain, particularly regarding security and updates;

- be portable;
- be usable without Internet connectivity; and
- have high "likability" for users.

The iPad was a good fit regarding many of these goals and allowed us to meet critical requirements. Specifically, neither Internet connectivity nor cellular service could be guaranteed in the intended educational settings; therefore, a device with self-contained content was required.

Once we chose the iPad as the device to be used, apps were needed. The benefits of apps are widely recognized in Extension education (Beckerman & Sadof, 2013; Dietz & Dickson, 2013; Memmott, Miner, & MacArthur, 2015), as is the need for multiple resources for developing apps (Sutherin, Lombard, & St. Hilaire, 2015). In our case, an eight-member development team created seven apps, one for each curriculum lesson. Each app reinforces lesson content through narration by Body Quest characters and game play.

Ten elements are important to creating a successful app. Here we identify those elements and describe associated best practices and lessons learned that could be useful to others interested in implementing this technology.

1. *Time.* Development may take longer than anticipated. When determining a concept plan, budget additional time for the app development phase.
2. *Money.* Costs for development can be substantial. Carefully determine all costs needed beyond obvious hardware and software costs. Consider licenses, certifications, and any computer peripherals that might be required in the development phase. Build in extra money to cover unexpected costs.
3. *Programmer.* Identifying an affordable person or persons to write source code to bring content to life can be challenging. For Body Quest, we chose two software engineering doctoral students. Students can be considerably less expensive to hire than a professional programmer, but their time is limited due to school schedules, they may have greater learning curves, and they may be available only for finite periods.
4. *iOS developer program.* This purchased software deploys apps through the App Store. The Data Universal Numbering System, or DUNS, number used to submit the app determines the institution/company name used in the App Store.
5. *Storyboards.* A well-defined vision of the app and a method for clear communication of this vision between content developers and programmers is necessary. The use of storyboards and graphic organizers depicting sequences of information worked well in the development of the Body Quest apps. Each app had its own storyboard. Each column in an Excel spreadsheet represented a single screen in the app. Rows included information for screen images, dialogue, music, game progression, and navigational instructions.
6. *Voice talent.* Budget for professional voice work to give apps the best vocal and sound quality possible. Body Quest characters, which are anime versions of children, narrated the Body Quest apps. Actual children's voices did not test well as children do not speak using measured pacing, a quality that is needed for easy understanding of vocal recordings.

7. *Graphic designer.* Image quality can make or break an app. Various types of images used in apps include video clips, animation, photos, and illustrations. The quality of an app is much improved by the inclusion of professional images.
8. *Testing.* Once an app is created, testing with the intended audience is critical. For example, when we tested Body Quest with children, we noticed that they often equated success with being the first to finish the app. Students rushing through an app are likely to miss intended educational concepts. To slow students down, we required that they find an "Easter egg," a hidden feature of the gamification, in each of the Body Quest apps. We would have been unaware of and unable to solve this critical problem had we not conducted testing with our target audience.
9. *Knowing when enough is enough.* An app can always be improved. At some point, the developers must be ready to deploy the app believing it is a high-quality product, even if they feel that a few minor issues remain.
10. *Maintenance plan.* Have a maintenance plan and budget before starting development of an app. The plan should address the need for future bug fixes and software updates.

Evaluation of iPads in the Classroom

Extension educators evaluated the use of Body Quest apps in the classroom through a written questionnaire. All educators (100%) perceived that students and teachers responded positively to the introduction of iPads in the classroom. Moreover, all educators reported that students were "very engaged" while using the iPads. Not only were students engaged in using the iPads but also 97% of the educators perceived that students understood the content delivered through this technology. Each educator responded that teachers found the iPad to be an effective learning tool for students. Perhaps the most telling of the educators' responses were to the process evaluation question "If given the opportunity, would you use iPad apps again to teach students?" Again all educators (100%) stated that they would use iPad apps again for teaching, indicating that use of the Body Quest apps was a positive experience in Extension education.

Opportunities for Use

The seven Body Quest iPad apps are available at no cost through the Apple App Store. All Body Quest curriculum materials also are free and are available at www.LiveWellAlabama.com.

Conclusions

Technology is an important learning tool that can engage students, maintain audience members' attention and focus, and provide teaching methods for different learning styles. Extension should incorporate contemporary approaches in teaching. By developing iPad app-based learning opportunities and bringing a mobile iPad library into classrooms, Extension can join others who are using e-learning tools to provide education.

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