

Designing Mobile Phone Based Educational Games to Improve English Literacy Skills of Limited English Proficient Adults

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English is one of the most commonly used languages in international business, and therefore, some level of fluency in English becomes a pre-requisite for many employment opportunities. Due to their limited English proficiency and a lack of opportunity to improve their English skills, a variety of adult populations are disadvantaged in many ways including career advancement and societal acceptance. For example, low-skilled immigrant workers in countries such as Qatar and the USA have limited English proficiency, which is often a barrier to their career advancement and creates communication problems with their supervisors. Similarly, limited English skills make it harder for refugee populations to find jobs and adjust to the local culture in their host countries. Also, the average deaf adult in the USA reaches only a 4th grade English reading level. Our work aims to address the problems of limited English proficiency among adults by providing these groups with a low-cost, easily accessible, fun tool for enhancing their English skills.

Mobile phones are currently the most prevalent and accessible computing technology for people of all ages and incomes. MILLEE (Mobile Immersive Learning for Literacy in Emerging Economies) [1], a project that started out at University of California, Berkeley, explored with the idea of incorporating educational content in English such as vocabulary, phonetics, sentence composition and spelling into mobile phones and their testing results show that the students improved their average test scores by about 38% by the end of a two-week testing period. [2] Similarly, TechBridgeWorld's iSTEP 2009 internship [3] in Tanzania produced the Literacy Tools project which uses a mobile phone game to give additional exercises to primary school students as part of an in-class activity. The game utilized the popularity of soccer which increased the motivation of students to play the game and practice the exercises. These related project efforts have demonstrated the success of mobile phone based educational games in improving English literacy skills among primary school students. The goal of the senior thesis is to investigate the effectiveness of mobile phone based educational games on adult English literacy.

This project builds on the iSTEP 2009 Literacy Tools model [4]

and has two components: a single player game accessible on a mobile phone and an online content authoring system which enables teachers to add useful educational content to the games.

### ***Content Authoring Tool:***

We approached our user groups (discussed later) and collected sample curricula from them. We also conducted literature review on ESL instruction and picked up strategies for preparing lesson plans for ESL students. Based on the needs of the curricula and the literature review conducted on ESL instruction, the Content Authoring Tool was modified to reflect the following changes:

- MySQL backend was added so that the questions can be reused.
- Support for image questions was added. This is because the literature review suggests that the visual aids in the questions make it easier for non-native English speakers to grasp the concepts [5].
- Support for dynamic user choices was added.

### ***Mobile Phone Game:***

After speaking with teachers and assessing student needs via interviews, we found that challenge is among the highest motivators for students to practice their English lessons. We introduced concepts of "levels" and "best times" in order to create a sense of competition among students. While the game is not multi-player, students can use the information to compare and compete. The students chosen for the experiments are already enrolled in a structured English classroom environment and hence, the main challenge of the game is to be "fun" so that students enjoy practicing their exercises or homework. In this regard, we decided that the graphics need to be more involved and interactive so as to get the attention of adults. We also discussed the design of three mobile phone games related to soccer, cricket and navigation and/or international travel. The game ideas build on learner's culture and experiences [6]. For example, we designed the soccer game after realizing that most students in the class were from Egypt, while also designing the cricket game which is the most popular among the students from Sri Lanka who are also a majority.

### ***Experiments & Results:***

We are working with user groups that are already enrolled in some form of structured English learning environment, and we collaborated with the teachers and/or administrators to assess needs and build the tools appropriate and culturally relevant to the groups. The tool is being tested out at the Western Pennsylvania School for the Deaf in Pittsburgh, USA and ROTA

Adult English Literacy Program in Doha, Qatar. The teachers at the respective institutions have been trained to use the Content Authoring Tool and the questions are being entered by them into the tool. We are currently one week into the field testing where we allow students to play the game for about 15 minutes per day (at the beginning or end of class). Preliminary results indicate that students really enjoy the game and find the questions challenging and addictive. The focus for the testing is also to score the highest score in the 15 minutes.

We have incorporated proven techniques from expert teachers into the educational games, along with graphics and game concepts that motivate adults to play these games. The combined result is an effective and ubiquitous tool for enhancing English literacy skills among adults with limited English proficiency.

#### **References :**

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