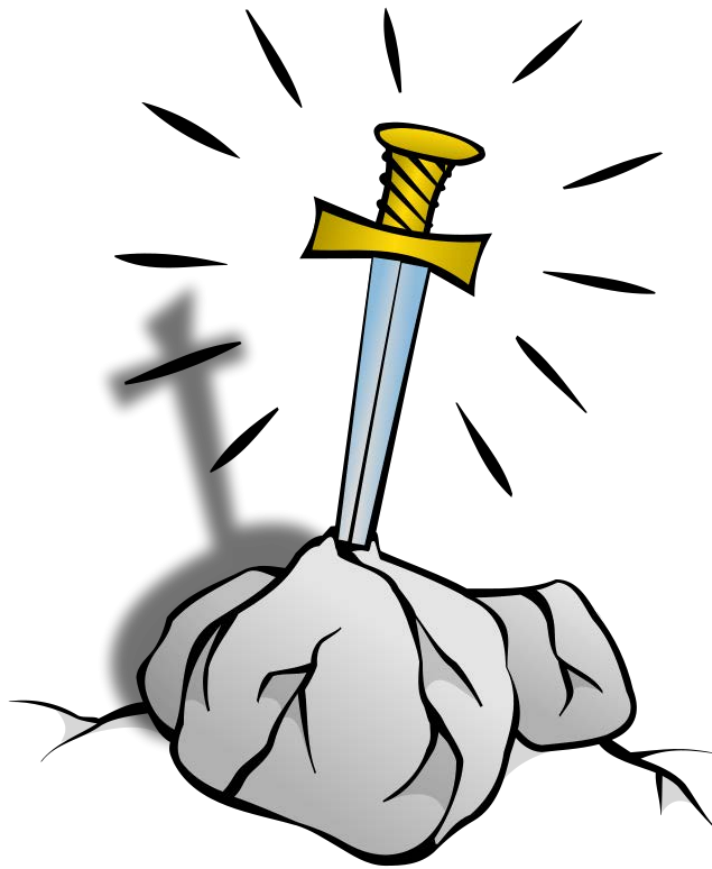# SOCIAL SURVEY FINAL REPORT

ECE1778 – CREATIVE APPLICATIONS FOR MOBILE DEVICES

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INTRODUCTION:

Education researchers use surveys to collect demographic and student opinion data. A growing limitation to surveys is the response rate. Online survey tools have resulted in an exponential growth in the number of student surveys and students are "surveyed out." This has resulted in a drastic reduction in response rates. We need to find a means to improve survey response rates if they are going to remain a valid research tool.

Gamification theory states that the same factors that are motivating hundreds of millions of gamers world-wide to play video games can be used to motivate users to undertake non-gaming tasks. Pioneers like Tom Chatfield have identified seven of these motivational factors[1].

    M1.   Experience bars measure progress
    M2.   Multiple short and long term goals
    M3.   Rewards for efforts
    M4.   Rapid, frequent and clear feedback
    M5.   Element of uncertainty
    M6.   Windows of enhanced engagement
    M7.   Other people

Our goal in Social Survey is to use gamification theory to motivate people to complete research surveys and thereby increase the response rate.

Players are knights in a fantasy world that do battle by answering questions about each other. Players' progress towards a long term goal of earning a lord or lady -ship is tracked by a progress bar [M1]. These battles create a constant stream of short term goals [M2]. Players receive constant feedback [M4] in terms of gold earned and energy remaining. Success in battle earns treasure chests [M3] which contain a random reward [M5]. Reward types include: in game rewards (gold, progress towards end of game), real world rewards (prize upon completion of game) and in game power ups. All of this takes part within the player's social network (integrated with Facebook) [M7]. Once we have players in a state of enhanced engagement [M6], we expose them to our ultimate goal, frequent survey research.

A standard method of increasing response rates is offering each participant a small reward. This can encourage "cheating" on the surveys (not answering honestly). Through creative use of game mechanics we encourage honesty by tying game progress to honest survey answers (as verifying with other players). Additionally this gamified survey allows pooling of research money to offer fewer but larger rewards. Dan Ariely's research shows that people are more inclined to cheat for small rewards, than for large rewards[2].

[1] TED Talk Video - http://www.ted.com/talks/tom_chatfield_7_ways_games_reward_the_brain.html
[2] TED Talk Video - http://www.ted.com/talks/dan_ariely_on_our_buggy_moral_code.html

Currently survey results are driving change with questionable results. For instance the response rate of the first year engineering students to the 2006 National Survey of Student Engagement was 14.1%. This means that is the survey indicated 25.6% of respondents were female we can somewhat conclusively say that between 16-36% of first year engineers are female. This is not an acceptable accuracy upon which make decisions.

If we are successful in creating a new avenue to survey post-secondary students, particularly an avenue with a high response rate and honest answers, our app could have a transformative effect on how survey research is done. It has the potential, in our opinion, but also in the opinion of existing survey researchers[3] of being a game changer (pun intended).

OVERALL DESIGN:

BLOCK DIAGRAM
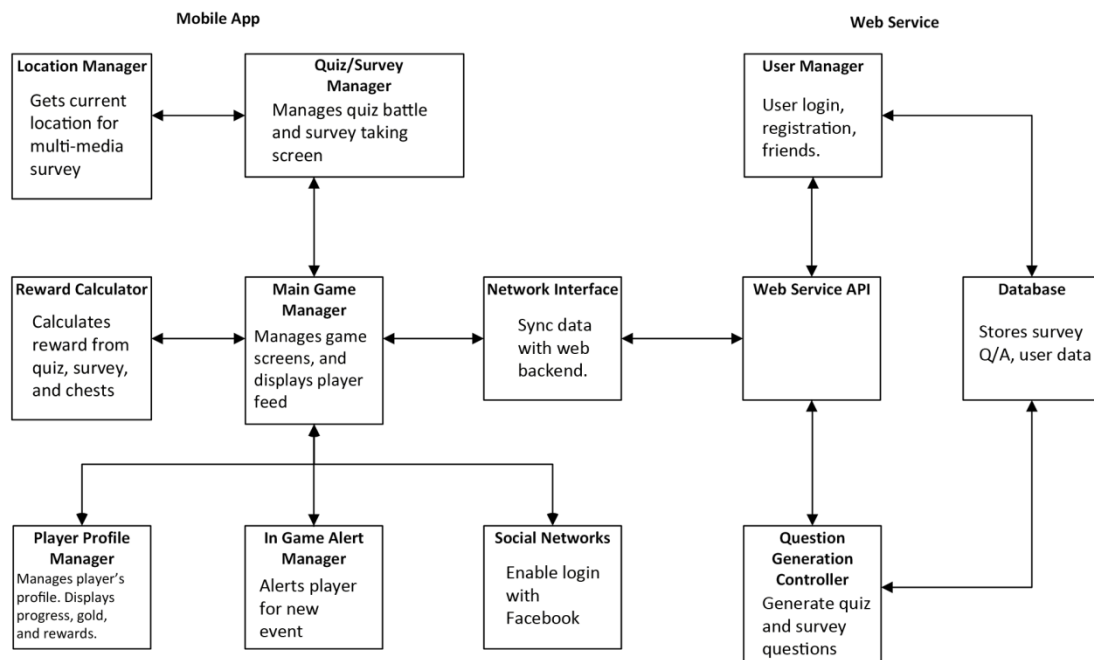
STRUCTURE:

The block diagram depicts screen and service interactions for different blocks. The app has a mobile device component as well as a web component. The mobile component displays information to user and retrieving survey data from user. The web component

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[3] Tricia Seifert - Assistant Professor - Dept of Theory and Policy Studies (Higher Education) - Ontario Institute for Studies in Education, University of Toronto

stores all user information such as amount of gold, energy and progress. The server is also responsible for essential game play content (challenge /monster battle questions).

MOBILE APP:
The game is centered on Main Game Manager. It is used for login/signup/login with Facebook and acts as a hub for users to receive updates and initiate actions. These are:

>Quiz/Survey Manager: Displays Quiz Battle screen, survey screen and monster battle screens.

>Reward Calculator: Invoked whenever a Quiz Battle is completed and rewards are calculated.

>Player Profile Manager: Displays detailed user information such as ranking, battle records, and monster defeated.

These functionalities are supported in the game by the Network Interface block which connects with our web service for sending and receiving data needed to fill each of the screens.

WEB END:
The data is saved in a MYSQL database. PHP scripts are used to create the web services to interface with the app. These scripts provides the ability to save and retrieve user information, user list for challenges, monster battle questions, quiz battle questions, quiz battle statuses, and answers to the survey questions. These scripts are called directly by the Network Interface that created on the mobile app component.

PHP code is added on the webserver to provide a simple interface between the SQL and the cellphone. The primary responsibility of the PHP scripts are to randomly generate quizzes for players based on the questions they have answered, determine what questions the user hasn't answered, generate survey questions, and saving pending challenges so the user's opponents can respond

Login Screen

Create Account: Players create new accounts using "Sign Up". Required input is a username, password with an optional email address.

Login with Facebook: Players can immediately log in using their Facebook account.

Login: Players can login using their existing username and password.

Future Work

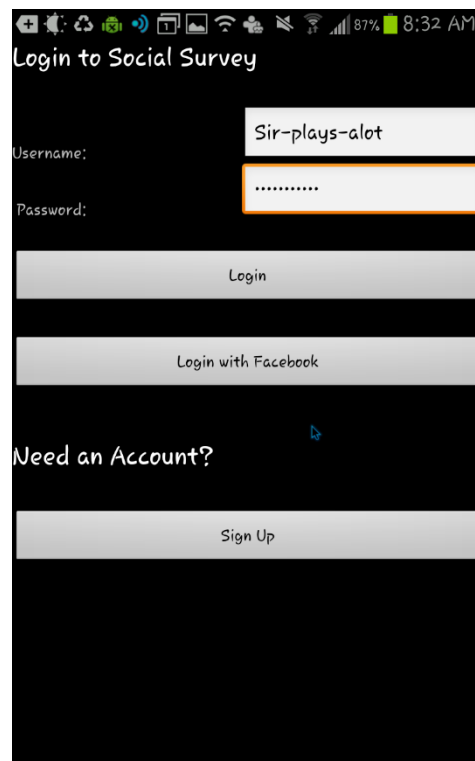Frequent usage is encouraged by minimizing obstacles to playing. We want to eliminate the need to type in a username and password for non-Facebook users as well.

FIGURE 1: LOGIN SCREEN

Main Page

Status Bar: Avatar (touch to access profile - Figure 12), player name, gold, progress in game (red bar) and energy (green bar).

Challenge: Use this button to challenge another Player to a Quiz Battle. This leads to Opponent Selection (Figure 6).

Recover Energy: Game actions reduces a Player's energy, limiting the actions they can do. Use this button for the Player to complete a survey (Figure 5) and recover energy.

Random Chests: To encourage Players to login each day a free "Daily Chest" will appear. Random rewards is a key gamification motivator. (Figures 3 & 4)
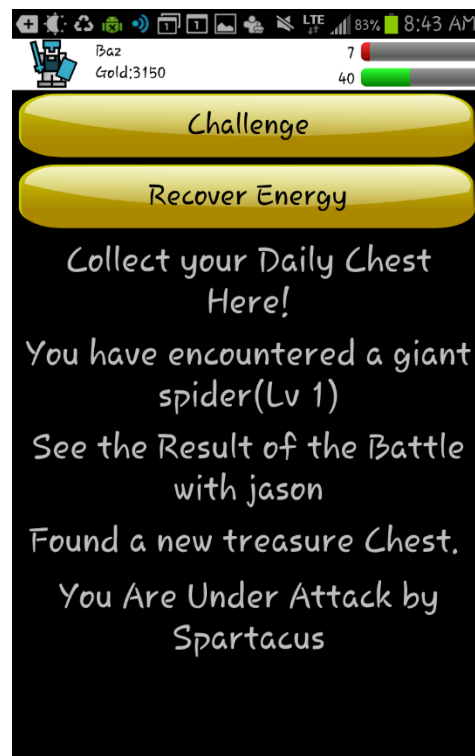

FIGURE 2: MAIN SCREEN

Monster Battle: A single player option enabling
play immediately upon joining (Figure 11).

Battle Results: When both side of a Quiz Battle have been completed a notification is
sent to the main page. Leads to the results screen (Figure 10).

Under Attack!: A notification on the main screen indicates when an opponent has
challenged you to Quiz Battle. Leads to the Challenge Accepted screen (Figure 9).

Future Work
Additional graphics for appeal, a "trash talk" channel to allow Players to taunt each
other, and optimizations for rapid login so that Players will check their main screen
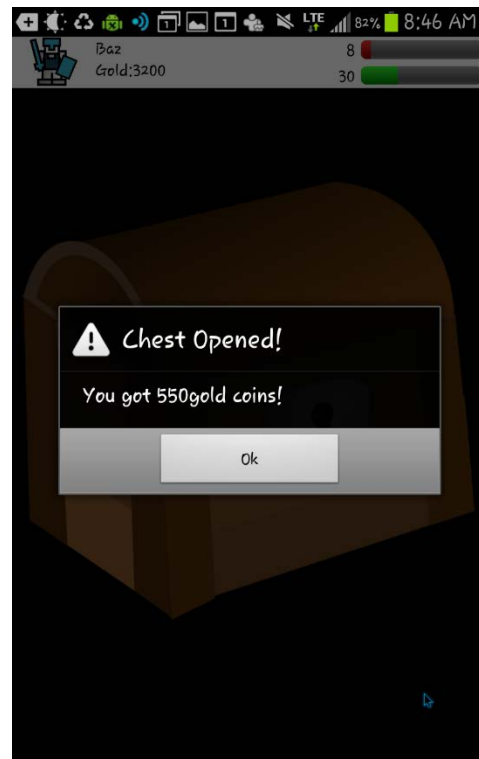frequently.

FIGURE 3: TREASURE CHEST

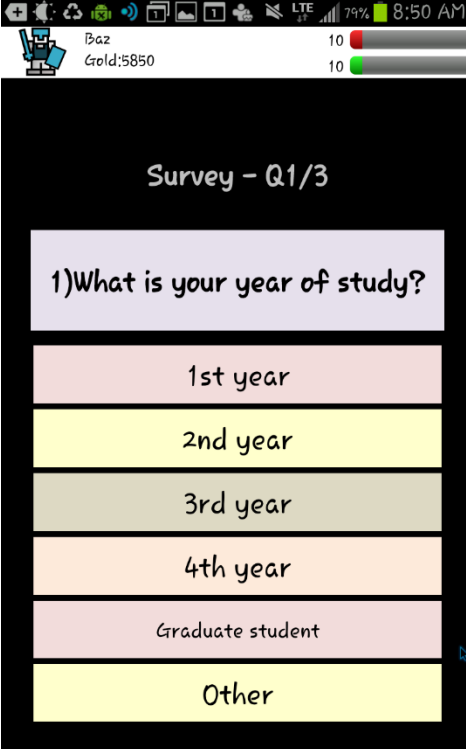FIGURE 4: OPEN TREASURE CHEST

Energy Recover Survey

These surveys are the core of this app. All other features are entirely to get Players to fill out these surveys. These surveys collect data on student demographics, behaviours, and opinions that are useful for education researchers. We hope that by using gamification motivations we can create a student panel of a greater diversity and devotion than is traditional for surveys resulting in a higher response rate and a greater honesty.

In keeping with the rapid game pace the surveys are only three questions long.

In addition to creating a database of student responses for education researchers, these survey answers are used to generate questions for Quiz Battles (Figure 7).

FIGURE 5: ENERGY RECOVERY SURVEY

Future Work

Survey questions are currently hard coded. The next stage is to create an easy-to-use interface where researchers could submit survey questions. A long term goal is an interface to control which questions are sent to which students. Such as sending a question only to first year engineering students.

Choose Your Opponent

The Challenge button on the main screen leads to this screen to select your opponent. Once selected it leads to the Quiz Battle screen (Figure 7).

Future Work

Currently all registered opponents appear on this single list. In future opponents can be sorted by "realms". These realms can be individual courses, institutions, program of study, etc.
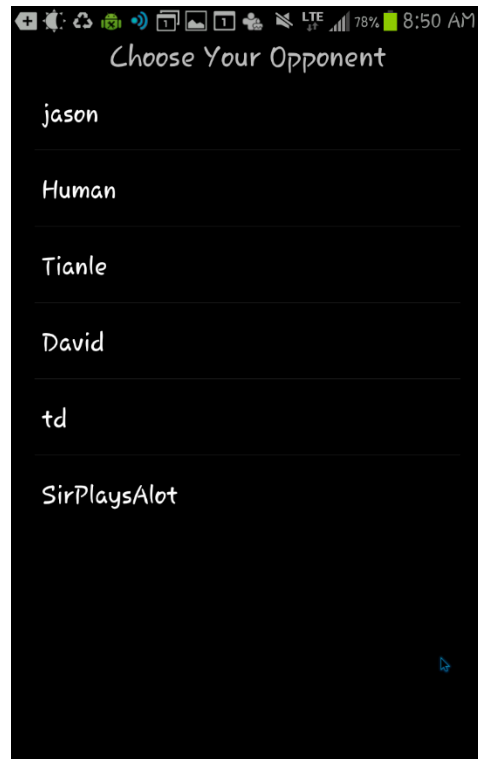

FIGURE 6: OPPONENT SELECTION

Quiz Battle

After challenging an opponent you will be asked five questions about that opponent. These questions will be based on the surveys your opponent has previously completed.
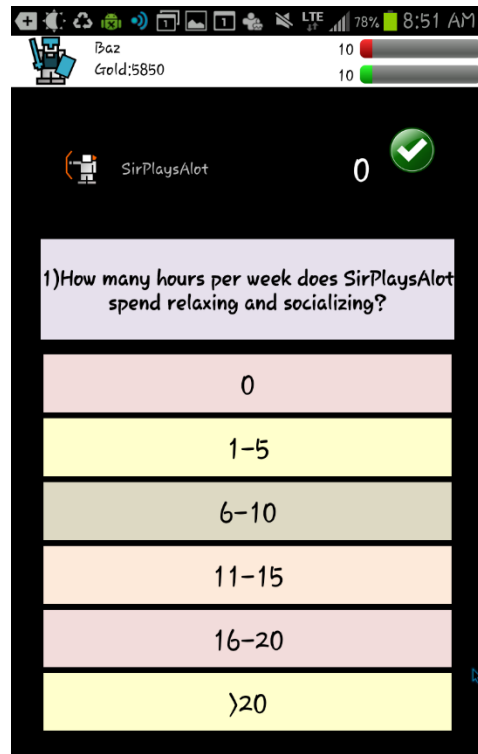

FIGURE 7: QUIZ BATTLE - QUESTION 1

Challenge Accepted?

Participating in a quiz battle potentially exposes a Player's personal information to an opponent. Therefore to get ethics approval the Player must be able to refuse a challenge without having to quit the game.

FIGURE 8: ACCEPT THE CHALLENGE?

Battle Results

After both sides of a quiz battle have been completed the battle result become available on both Player's main screen. The winner is indicated on the second line.

Score summary indicates how many questions each Player got right.

Your reward indicates an increase in gold and game progress.

To encourage honesty in survey answers the reward gained will increase with the number of answers that your opponent got correct. Maximum reward is gained by correctly answering five questions about your opponent and your opponent correctly answering four questions about you. If you have been dishonest in your surveys, and your opponent has no correct answers about you, then you get no reward.
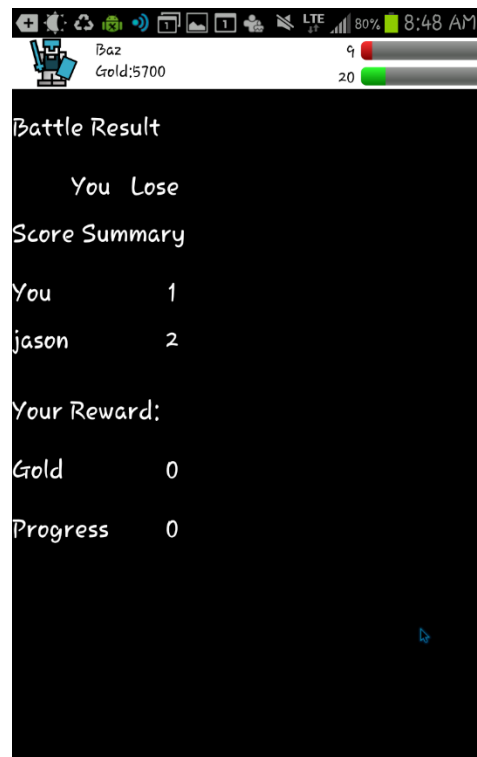

FIGURE 9: BATTLE RESULT

Monster Battle

Single player mode allows Players to fight monsters instead of other players. Rewards for these battles are limited as we do not want the game to be entirely playable in single player mode.

The monster you are battling is displayed graphically. The sword allows you to trade gold for the ability to remove one wrong answer. The scroll allows you to trade a large amount of gold to bypass the current question.

The green checkmark indicate the number of correct answers. If you get all the questions correct you get a treasure chest. Questions are trivia questions based on your currently geographic location.
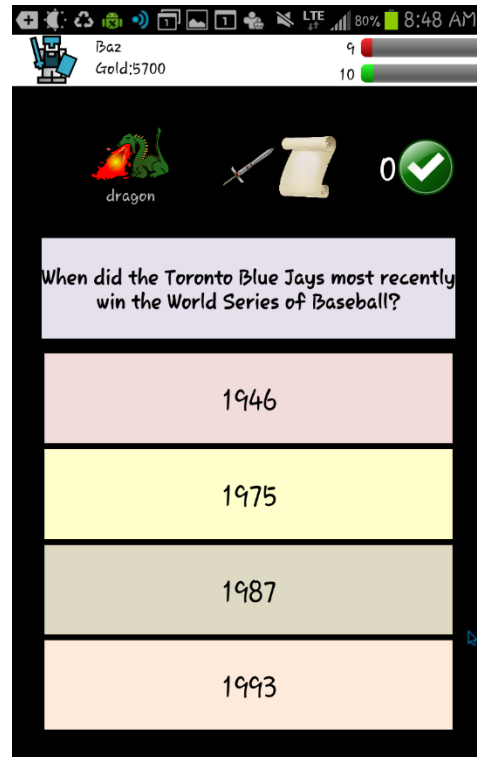

FIGURE 10: MONSTER BATTLE - DRAGON!

Profile

This details player statistics such as progress towards the end of the game, energy remaining, gold, rank within the realm, recent battle record, and monsters defeated.

Future Work

Currently the Rank, Battle Record, and Bestiary are static and need additional work to implement.
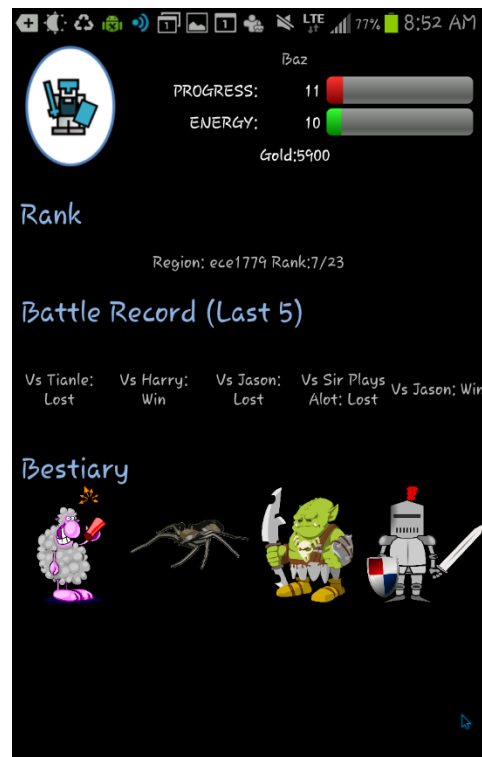

FIGURE 11: PROFILE PAGE

WHAT DID WE LEARN
1. Programming on Android. I learned how to create scalable user interface for Android and how to make network connections and error handling.
2. Programmers should have communicated with each other more frequently and clearly. This could avoid duplicate work and failure to integrate code from time to time.
3. Simple integration between Facebook and Android.
4. How to setup SQL server to manage user data
5. Interfacing between SQL with PHP
6. It is important to have better team communication in the early stage of application development. More frequent team meetings is necessary to ensure we are all on the same page.
7. I assumed that having a large student panel would be sufficient for survey validity, but upon extensive consultation with experts in the field I realized the importance of maintaining an initial randomly selected student panel.

CONTRIBUTION

HARRY:

GAME INTERFACE:
- Layouts for different game screens (login, signup, main game screen, challenge result, feeds)

FACEBOOK:
- Integrate with Android Facebook SDK
- Allowing user to login with Facebook
- Using basic information from Facebook as user account data

WEB SERVICE
- Setting up database, wrote all the server php scripts for retrieving questions and managing user information.
- Updating the user survey data to the SQL database
- Retrieving the news feed at login time
- User name and password authentication and new user creation

GAME INTEGRATION
- Login and signup using our server such that all user data are saved on the server.
- Fetch and save challenges to server. Reporting finished challenges back to the challenger.
- Generating player feed based on current open challenges

DEBUGGING AND TESTING THE MOBILE APPLICATION

TIANLE:

GAME INTERFACE
- Template and interface for generating a survey.
- In game items, single player battles, single player monsters
- Downloading questions from online server
- Quiz battles, selecting opponents, accepting battles
- User profile page

WEB SERVICE
- Saving survey data from the mobile application onto the SQL server
- Query the SQL database to generate questions for monster battles, challenges and energy recovery survey
- Retrieving user data for each user, the User name, gold energy and progress values

DEBUGGING AND TESTING THE MOBILE APPLICATION

JASON:

APP CONCEPT
- Clear statement of Goal and Motivation
- Market place benchmarking
- Screen mockups
- Ran focus group for faculty and graduate student education researchers who specialize in survey research

WEB SERVICE
- Generated survey questions
- Generated trivia questions

DOCUMENTATION
- Prepared presentations
- Initial draft of reports

FUTURE WORK
Throughout the functionality section above several specific instances of future work were indicated, but below are some general works.

CREATE A WEB-BASED MANAGEMENT PLATFORM
It is important to create a web based management platform for administers of the application to easily customize and add additional survey questions. It is also important to have an efficient method for retrieving survey data requested by researchers.

AN EFFICIENT METHOD FOR DELIVERYING REAL LIFE REWARDS
The ultimate goal of this game is for player to reach 100% in progress, in this case the player is expected to receive a nice real life (out of game) reward. We still need to work out a method for the user to provide their address so we can send them the reward.

MONSTER BATTLES FOR OTHER CITIES
Currently the database only contain custom single player questions for the Toronto region. If the game is intended to be played outside the Toronto region, we should provide additional questions for other cities and countries.

RETREVIVING ADDITIONAL INFORMATION FROM FACEBOOK
As an additional feature, we can use Facebook as a source to generate additional questions. By saving information about user's current status, profile and updates. We can generate more interesting questions about the players.

CUSTOM SURVEYS
As an additional feature, we can create an interface for users to spend gold and create custom surveys which will to broadcasted to his or her friends. This will be an additional incentive for the users the play the game.

CUSTOM FUN FACTS
After gathering sufficient information, we can allow the players to unlock custom fun facts about themselves, the fun facts will be generated based on the answers everyone provided between challenges and custom surveys.

ETHICS APPROVAL FOR IN CLASS TRIAL
Ethics approval is proving more difficult to obtain than anticipated.

CONDUCT IN CLASS TRIAL
Since ethics approval was not secured no student trials were conducted. These will proceed once approval is secured.

GAME MECHANICS OPTIMIZATION
Critical game mechanic factors such as rate of energy recovery, size of gold rewards, length of progress bar, and number of survey questions will need to be tweaked in order to maximize game appeal.

BUSINESS SCHOOL:NO

OPEN SOURCE:NO