**Detailed Evaluation Plan**

The power-related app community in the Google Play Store and the Apple app store is practically nonexistent and contains only a handful of applications. The apps that were the most similar to “The Source” in terms of having the user build his or her own power plants were city simulations such as “City Island 2”[1], “Moon Base”[2] and “Megapolis”[3]. In these apps there was no educational view as to how the power was generated, but often apps like the ones listed covered pros and cons of the types of power that were available. From an educational direction there were very few apps that explained how power plants worked, and the ones that did explain only focused on one type of power. The types of power usually covered by these types of apps were nuclear and solar as those are the more interesting of all the types. As of a searches performed prior to March 2nd 2015, there were no apps in either store that directly focused on energy as a whole and providing an understanding to the user as to how multiple power sources work.

Not surprisingly, the Internet had a more plentiful market of educational energy-based games. These games covered multiple energy sources and gave detailed descriptions, animations, and data on how these power sources operate. A good example of such a game would be “Save the World”[4]. Although not all games have a goal of being educational, there were a few like “Save the World”[4] and “Energyville”[5] that clearly had educational objectives. In comparison to all of the other games that were reviewed, the overall goals of these games were the same as those of “The Source”, although they differed in how the user accomplishes tasks, in design, and in the variety of power plants that were covered.

In summary “The Source” differs from any energy based app in the Google Play and Apple app store in the variety of power sources that are covered, educational focus, and unique design. “The Source” is also unique in comparison to these other apps because of its educational focus which does not exist in most games. In comparison to educational web based applications “The Source” only differs in the content that it covers and its unique design. This is important because it means that new content is being covered and shown in a different manner than what other people are doing.

In order for “The Source” to be successful it must be evaluated in two ways. The first way “The Source” must be evaluated is in terms of usability and it must meet the following two criteria. The application must be engaging to the user and provide an overall pleasant playing experience. The application must also help the user to comprehend general facts about where power comes from and how power is generated. If the source is successful in these two ways then it will also be successful in being different from all other content in its market. The second way “The Source” must be evaluated is in terms of numeric stability and consistency. In order to discover if the game is successful in meeting these criteria, it will be tested on a group of test subjects discussed below.

**The Guinea Pigs**

The Source is primarily targeted at high school students, but due to time constraints and a lack of high school students the game will be tested on about 20 university students. Each student will fill out two questionnaires, one dedicated to evaluating the numeric stability of the game and one dedicated to discovering if the users have learned anything while playing the game. If both questionnaires return with significant results then it will be indicative of the participants having had an enjoyable and educational experience.

**Numeric Stability Questionnaire**

After playing the game at least twice the user will immediately answer the questions below based on the last time they played the game. The questionnaire's purpose is to discover the user's tactics during the game, for example, why he or she made certain choices. Knowing this information will reveal numerical flaws in the game, such as if a power source is too strong or if an aid is too weak. This information is important to know because it reveals imbalances in the game that would need to be fixed.

Specific pieces of information that will need to be collected from this group include

1) The number of advertisements that were not used and which ones they were

2) The number of public services that were not used and which ones they were

3) Were there any power sources that were not built, what were they and why not

4) Were there any pieces of information that were not displayed that should have been displayed

5) On a scale of 1 to 5, 1 being not a challenge, 3 being just challenging enough, and 5 being a challenge. How challenging was it to keep up with the power demanded?

6) On a scale of 1 to 5, 1 being too slow, 3 being just right, and 5 being too fast. Please rate the pace of the game?

7) Were some items too expensive or too cheap? Did these extreme costs make the game too easy or hard? Please list these items.

8) How many times did the user use the fast forward button

9) In addition to the items listed above, statistics regarding how the user is doing throughout the game should be collected. These statistics include current amount of money, number of fossil fueled power plants built, number of windmill and solar panels built, number of dams built, number of occurred blackouts, number of ads used, number of public services used, and the current year. Gathering this data will help reveal potential flaws. For example, the user should not have $1000 five minutes into the game because then the game would pose no challenge as the user could purchase anything. The data will be automatically recorded and pushed up to parse, a database system, and then evaluated later.

10) Choose the statement that best applies to you

a) I never got frustrated

b) I got frustrated a little

c) I got frustrated a lot

d) I was frustrated all the time

11) Would you rate your experience playing the game as positive?

On a scale of 1 to 5 where 1 is negative, 3 is neutral and 5 is positive. Rate your playing experience

12) On a scale of 1 to 4, 1 being I have learnt nothing, 2 being I have learnt a little, 3 being I have learnt a moderate amount and 4 being I have learnt a lot. Rate how much you feel you have learnt about how energy operates in your playing experience.

13) Did you ever have a hard time finding a specific screen and if so which one?

14) Additional Comments

**The Educational Questionnaire**

This questionnaire's purpose is to discover if the user learned anything while playing the game. In theory the people who know nothing should learn a lot, the people who know a little should only learn a little as the game only covers power at a general level, and the people who are knowledgeable should learn almost nothing. In order to know if a user has learned anything he/she will be required to complete a short knowledge test before and after completion of the game. This way the pre and post answers will be compared to discover if the user has learned anything.

Specific things that this user group will have to do is to give a brief understanding of each kind of power, for example:

**Hydro:**

1) What is source of energy for a hydro-electric dam?

a) water b) tidal-waves c) chemical reaction with water d) rain

2) Explain how a hydro-electric damn uses the energy source to create power.

a) Water powered by gravity turns a turbine which in turn powers the generator which makes a current

b) Water is pumped past a turbine, causing it to rotate, which in turn powers the generator which makes a current

c) Chemical reactions inside the turbine create a pushing force cause the dam to rotate which in turn powers the generator which creates a current.

d) The force of the tides cause water to move past the turbine causing it to rotate. This powers the generator which creates a current

3) List 3 pros and 3 cons of the hydro-electric dam.

These same three questions will be repeated for each kind of power (with different multiple choice questions) and answers to each are within the game. A score will be generated for their answers before and after playing and by comparing the answers we will be able to see if the user has learned anything.

**Conclusion:**

With all of these questions answered it can be discovered if “The Source” was successful in meeting the criteria of numeric stability and usability. More specifically, it will be determined if “The Source” is successful at being a positive playing experience and teaching users general facts about where power comes from and how power is generated.

**References:**

[1] City Island 2, Created by a group known as Sparkling Society ™, unknown publication date.

https://play.google.com/store/apps/details?id=com.sparklingsociety.cityisland2&hl=en

[2] Moon Base, Created by Marc Bechamp, unknown publication date.

<https://play.google.com/store/apps/details?id=jeu.de.marc&hl=en>

[3] Megapolis, Created by a group known as Social Quantum Ltd, Unknown publication date.

<https://play.google.com/store/apps/details?id=com.socialquantum.acityint&hl=en>

[4] Save the World, Created by Wonderville, Unknown publication date.

<http://www.wonderville.ca/asset/save-the-world>

[5] Energyville, Created by Cheveron, Unknown publication date.

http://www.energyville.com/energyville/