# Criteria A

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## Problem:

Karen Steinbach, the client, is the Clinical Research Product Manager of the Learning Disabilities Research Program and the Empower Reading Program Coordinator at the Sick Kids Hospital in Toronto. She is inclined to make a game that will help the patients make logical and spatial decisions. Ms. Steinbach feels that the games being played by the patients in the facility are not as challenging and that they do not feel inspired to take part in the program. Therefore, she would like to make a game where patients are more engaged at the tasks given to them. These games should also be more creative and fun. She wants the games to be run on easily-available computers, much like the ones found at local schools. The games should be designed for the patients.

Ms. Steinbach believes that games can help the process of rewiring the brain of the patients in the hospital. Overtime she hopes that the patients will be able to read to their hearts content through these training exercises in the form of games.

The problem that Karen Steinbach faces is to how to go about making a game that will help the patients as well as intrigue them.

## Research Plan:

Norman Doidge’s book “The Brain that Changes Itself” specifically talks about neuroplasticity, which is good for the patients in the Empower program. In chapter three of his book he states, “Plas­tic­ity can be summed up in a few suc­cinct state­ments all from chap­ter three – Redesign­ing the brain:

1. Neu­rons that fire together wire together.
2. Neu­rons that wire apart fire apart. This is also stated as Neu­rons out of sync fail to link.
3. Use it or lose it” [[1]](#footnote-1)

From this we get to know what will help us make a game that will have a positive impact on the patients’ brains. The game must stimulate the neurons of the brain so that they will easily wire together. The game must target the necessary components of the brain that are required for logical and spatial decisions.

Dr. Denise Charney, dean of the Mt. Sinai School of Medicine, has been studying how the brain reacts to changes in the environment. Charney shows how prisoners of war who are placed in a prison in solidarity develop unique cognitive abilities because the only activity that they could take part in was thinking. Charney uses this research to perform psychological therapies that improve the cognitive abilities of patients. Therapies are used for problems such as anxiety and depression.

The Empower Reading Program was developed by Dr. Maureen W. Lovett. Her team, consisting of educators and psychology professionals in the Learning Disabilities Research Program at the Sick Kids hospital are teaching people of all ages with reading disabilities, the skills that are required for them to read. This program has been going on for 30 years and it has constituted successful programming for students with significant reading difficulties.

Dr. **Michael Stryker is one of the leading researchers in Neuroplasticity. He and his team are pursuing four areas in the laboratory:**

“(a) Understanding the coupling between the physiological and anatomical changes responsible for neuronal plasticity.

(b) Understanding the cellular mechanisms of activity-dependent cortical plasticity, primarily through the use of transgenic mice.

(c) Understanding the interaction between neural activity and  molecular cues in the formation of cortical maps.

(d) Understanding the difference between the limited plasticity in the adult brain and the much greater plasticity during critical periods in early life.”[[2]](#footnote-2)

## Inspirational Pieces

The games that are essential for the success of the Empower Reading Program are the ones that target the logical and spatial aspects of the brain.

Since Ms. Karen Steinbach requested that a game was to be made and it should teach the patients on how to make logical and spatial decision. I decided that I wanted to make a game much like the popular Trading Card Game called Yu-Gi-Oh.



This is a game where the players must make logical decision in order to defeat their opponents in a turn-based card game, where the opponent uses monsters along with spells and traps to conquer the opposing deck and win the game!



This is the basic layout that I would be using. This is the layout that is used in the Yu-Gi-Oh Duel Generation Android Game. As one can see here, the game is not too complicated for the brain, and over a period of time, the game can be enjoyed by almost anyone.



When the game is to be played, the players would be arranging the cards in this manner, which will help the children’s logical (as to where to place the card) and spatial abilities (as to how to neatly place the card).

## Project Specifications

1. A grid system.
2. Widgets on screen (new widgets outside of JButton, JLabels, and JTextFields).
3. GUI with instructions.
4. Not many words.
5. Visually cues to help the kids.
6. Logical or spacial. Can be 1 to 2 players.
7. Must have a theme. (Should be age appropriate (gr 5)).

8. Game allows students to practice spatial, logical or linguistic skills.   
 9. Game is mainly visual, with limited written content.   
 10. Good user-interface design principles are used.   
 11. Game is fun and engaging for grade 5 learning-disabled students.   
 12. Code is easily adaptable.   
 13. Requires 1 or 2 players.   
 14. A new widget is used.

# Works Cited

**"Neuroscience Graduate Program." *Neuroscience Graduate Program*. Web. 7 Jan. 2016.** **http://www.neuroscience.ucsf.edu/neurograd/faculty/stryker.html**

**"Neuroplasticity and the Brain That Changes Itself." *SharpBrains RSS*. 12 Nov. 2008. Web. 7 Jan. 2016.** **http://sharpbrains.com/blog/2008/11/12/neuroplasticity-and-the-brain-that-changes-itself/**

**"Neuroplasticity: You Can Teach An Old Brain New Tricks | Big Think."*Big Think*. 17 Oct. 2012. Web. 7 Jan. 2016.** **http://bigthink.com/think-tank/brain-exercise**

**"Empower™ Reading." *Empower™ Reading*. Web. 7 Jan. 2016.** **http://www.sickkids.ca/LDRP/Empower-Reading/**

1. "Neuroplasticity and the Brain That Changes Itself." *SharpBrains RSS*. 12 Nov. 2008. Web. 7 Jan. 2016. [↑](#footnote-ref-1)
2. "Neuroscience Graduate Program." *Neuroscience Graduate Program*. Web. 7 Jan. 2016. [↑](#footnote-ref-2)