

Hong Kong Student Science Project Competition 2021

Template of Extended Abstract (Invention)

(Word Limit: 1,000 words, Pages: 2 pages only)

Team Number: JAPE110

Project Title: Brain it on

Project Type: Invention

To our best knowledge and after thorough literature research, as at _30 / _6 / _2022_, there ~~are~~ are no similar works. If there are, the reference links are as below:

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The enhancement our project has made for the existing related products or research is summarized as below:

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***Please delete if not applicable. HKSSPC values the originality of works. Students must conduct literature research thoroughly to ensure that their works are unique, and to list relevant reference materials to complement the research or invention.**

I. Background

- Provide background information as to learn about the audience for whom the project is addressing
- Provide highlights of **literature review** and/or related technologies or devices, with the support of pertinent and reliable references
- Provide an overview of work, create a point of view as to define the needs and insights of the audience and mention the **research or technology gap the project is trying to fill**

An article about dementia published by the Elderly Health Service from the Department of Health in 2022 shows that there are as many as 100,000 patients with dementia in Hong Kong, nearly one-tenth of the elderly population. The disease affects the patient's memory, thinking, language, judgment, behavior and personality. Patients will gradually lose their memory and other cognitive functions (such as learning, comprehension, the use of language, sense of direction, and judgment, etc.), they will completely forget about what happened. They will also find it difficult to remember items in memory tests, to express themselves and to comprehend what others said. They will have poorer spatial judgment and a poorer sense to the change in temperature. Their cognitive function also degenerates to the point of affecting normal life which seriously affects their daily routine. (source: From Wikipedia, The article of Dementia.)

6. Objectives

- State the **aim(s)** of project

A simple and convenient app is designed to help the elderly and families of people with dementia so that they can directly get the latest information, assessment and training, which are very useful. Through our app, we hope to integrate love and care in technology by bringing the elderly closer to their families, and to increase public awareness of dementia.

7. Methodology

- Briefly describe the **approaches** used e.g. use of equipment, materials, tests and experiments
- Explain the selected implementation strategies with the **scientific theory**

Currently, we have two directions to test our apps, which are to test the accuracy of our evaluation and the utility of training.

In terms of the accuracy of the test assessment, we plan to find 60 seniors without cognitive impairment(20 of them are 60-70 years old,20 of them are 71-80 years old,20 of them are 81-90 years old, with 10 female and 10 male in each group)and 60 seniors with cognitive impairment(20 of them are 60-70 years old,20 of them are 71-80 years old,20 of them are 81-90 years old, each group with 10 female and 10 male) to complete our assessment at the same time, and then proofread our grading criteria based on the scores they receive to understand the accuracy of our grading criteria.

In terms of training effectiveness, we plan to find 30 seniors (10 of them are 60-70 years old, 10 of them are 71-80 years old,10 of them are 81-90 years old, each group with 5 female and 5 male), record their scores for each day of training, and then compare their scores on the first day after six consecutive days, to determine whether our training is effective or not.

8. Design of Invention

- Describe the **design** and the **principle** of invention (e.g. The ideation of the projects, the prototypes or creative solution as far as applicable)
- Provide sketches / drawings / photos of the invention

The app is designed with different components including Latest information, Training, Assessment and Families encourage.

The applications we mainly use for programming is “Thunkable”, and the two functions we often use in assignment are “row” and “column”. These two features help us plan the location of the button or label. Users can use them easily, and it also helps subsequent programming.

7. **Application / Market Need**

- Explain the area of **application** and function of invention
- Indicate the market need and impact of invention
- Discuss **limitation** and compare with existing related works (if any)

Our app needs more time to find more elderly and dementia's patients to test its accuracy and to improve the strategy method. Therefore, our app's assessment accuracy can be improved.

For the future of development, we hope we can collect the time spent on playing games by the elderly. We intend to use the database to record the time. Based on how long they play the game, the difficulty of the games for elderly to train will be changed accordingly. Then, the difficulty will be gradually increased, enabling seniors to achieve effective training. We want to provide the elderly with physical training such as balance training and hand-eye coordination training, which can delay degeneration and maintain mobility.

8. **Conclusion**

- Make a **data-driven** conclusion of the project and the way forward of the invention process
- Justify if the proposed project meets the objective(s)

Through our app, we hope to integrate love and care in technology by bringing the elderly closer to their families, and to increase public awareness of dementia.

*** Our project is developed based on our school's previous project and the enhancement is as below:**