

# Hwa Chong Institution

## Project Work

### Category 3 Inventions Log Book

Title of Project: Hold steady Cup
Group Name: 3-36
Group Members:  1) Tan Xi Lun  2) Loke Yuan Bin Lincoln  3) Choo Yi Jie Christopher  4) Ryan Tan Wei Han

#### 1. Problem Finding

(The beginning...)

##### 1 A List of problems we have identified

- 1) *Elderly with Parkinson's disease could not hold their cup properly*

*Elderlies did much for us and we did little for them, so we wish to help them by making their lives easier. We thought of elderlies with Parkinson's disease and how tough life was for them. A problem for them is that they could not hold their cup properly, hence, it is hard for them to drink without spilling liquid from their cup. Thus, we wish to make it easier for them.*

- 2) *Elderly with Parkinson's disease have difficulty with walking, balance, and coordination*

*Same as the problem above, it is another problem we thought of concerning elderlies with Parkinson's disease. A problem for them is that they have difficulty with walking, balance, and coordination, hence, they take a long time to walk from place to place and they might often fall down. Thus, we wish to make it easier for them.*

- 3) *Yakult bottles are hard to open when people try to open it with their bare hands*

*This is a problem we often encounter, as we can no longer get straws along with yakult bottles when we buy yakult. As a result, if we want to drink yakult, we need to open it with our bare hands and it is often hard to do so. Sometimes we might cut ourselves when trying. Thus, we wish to solve this problem to make lives easier for people like us.*

##### 1 B Selected problem

*Problem we selected: Elderly with Parkinson's disease could not hold their cup properly*

*Considerations:*

*The problem “Elderly with Parkinson's disease have difficulty with walking, balance, and coordination” is hard, almost impossible to create at our age, with the resources available to us, hence, it is eliminated.*

*The problem “Yakult bottles are hard to open when people try to open it with their bare hands” is a minor problem that does not require solving, hence, it is also eliminated.*

*The problem we selected “Elderly with Parkinson's disease could not hold their cup properly” is a problem that we are able to solve and it is also significant to have the need for a better solution, hence, we are choosing this problem.*

**1 C List some problems my group would like to solve.**

**Problem Evaluation Grid**

**Point 1 (least significant) to 4 (most significant).**

<i>Considerations for Selection</i>	<i>Problems</i>		
	<i>#1: Elderly with Parkinson's disease could not hold their cup properly</i>	<i>#2: Elderly with Parkinson's disease have difficulty with walking, balance, and coordination</i>	<i>#3: Yakult bottles is hard to open when people try to open it with their bare hands</i>
<i>Consideration 1: Feasibility</i>	4	1	4
<i>Consideration 2: Change to targeted group when solved</i>	3	4	1
<i>Consideration 3: Need for a solution</i>	3	4	1
<i>Total Score</i>	10	9	6

**2. Define the Problem**

**2 A Extent of problem (Research and discuss the problem and write down the problem statement)**

There are several thousands Singaporeans with Parkinson's disease, hence experiencing the problem. This is a rather annoying problem for those who experienced it as it can increase the burden of those helping them and this can make them feel embarrassed when they are outside. This is not life threatening or anything near that level, but it is certainly something that, when solved, can make the elders' lives easier.

**2 B Compare and contrast the existing or similar solutions.**



**Hand Steady Mug:**

*Pro*

*- Rotatable handle allows user to hold on to it in a stable position*

*Con*

*- Hard to tip the cup to the user's mouth*



***No Spill Cup:***

*Pro*

*-Does not spill easily  
due to curved rim*

*Con*

*- Hard to drink from due to curved rim*



***Kangaroo Cup:***

*Pro*

*- Easy to hold*

*Con*

*- Bulky, hence hard to store*

*- Not very effective*

**3. Your BIG IDEA#**

(Developing the idea....)

### 3 A Description of our proposed invention.

Part A is the part to drink from.

Part B is the part to refill the cup.

Part C is for the person to hold on to.

Part D is to act as an extra leverage for the person to hold.



### 3 B The purpose of our proposed invention and the potential benefits to users.

The purpose of this solution is to make the user maintain a stable grip on the cup, hence they can avoid spilling. This can help the user hold it comfortably and steadily. This can assist elderly with Parkinson's disease in holding the cup with a firm grip.

### 3 C Ways our proposed invention are better than existing solutions.

Our solution is better than the hand steady mug as our product is easier to tip towards the user's mouth than the hand steady mug.

Our solution is better than the no spill cup as it is easier to drink from our product than the no spill cup.

Our solution is better than the kangaroo cup as our product is more effective than the kangaroo cup. The kangaroo cup is also bulky, hence users might not be able to fit it in their bag when going out, and being embarrassed from spilling liquid outside their house is an important reason this problem exists, hence the design of the kangaroo cup defeats part of the purpose.

### 3 D What are some problems you expect in the course of your proposed invention?

The prototype is hard to create.

Hard to get materials for building the cup.

Failing to create a workable prototype.

### **3 E What and when are the major milestones (project timeline) in your invention?**

22 January 2021: Our project group was formed

19 February 2021: We met up with a teacher and she agreed to be our mentor, however, she realised after that that she hit max quota, hence, she could not be our mentor. This meeting let us know how to develop the ideas that we had and it was a great help to us

25 February 2021: We met up with our mentor, it helped us to finalise our ideas.

1 April 2021: We met up with our mentor through google meet for improvements to our presentation.

6 April 2021: Project proposal

28 July 2021: Important meet up with mentor

## **4. Proposed Construction or Modelling Process\***

(This first... then that...)

**You are now onto the fabrication of your prototype/ product. You need to select material and understand how to put them together so that your prototype/ product can perform its function.**

### **4 A Explain how and why the materials were chosen for the prototype/ product of your invention**

Plastic was the proposed material for the product. It is light, hence the elderly can bring it up to his/her mouth and drink from it easily. It is also hard to break and a poor conductor of heat, preventing the cup from easily breaking when dropped and heat from being conducted to the elders' hand.

### **4 B Explore these considerations that may guide the construction of your prototype/ product.**

- The comfort of the elder: Would the elder be happy with the way of drinking?

Solution: Smaller tip for drinking

- Possible problems: How to refill the cup?

Solution: A hole on top that can be opened or closed to refill the cup

- Mobility of product: Can the cup be taken around easily?

Solution: Make the cup light by using plastic material and make the protruding shorter hence the cup takes up less space.

### **4 C Propose how the prototype/ product will be constructed or developed. You may use drawings and photographs.**

It will be manufactured as several different parts, first part A, then part B, C, D and finally the entire body of the cup. After that, fit part A, B C and D to the main body of the cup. The body of the cup must have several holes at where parts A and B should be, hence the liquid can flow to part A when needed and part B can be opened when required. Parts C and D can just be stuck to the body of the cup.



**OR**

**If construction of the prototype is not possible, then you have to create an animation /video as a proof of concept that it can be applied in a bigger scale.**

**4A Explain why construction of a prototype is not possible and the proof of concept is needed in your case.**

There was not enough time due to the pandemic and there were many tests as well, not to mention many restrictions due to the pandemic and we could not meet up in person to create the prototypes, thus we were unable to construct a prototype.

**4B Briefly explain how the video / animation can effectively show how your invention will work and the different considerations.**

The video can show how the invention is used, which part to hold and which part to drink from, as well as how to refill the cup. Some considerations were: how the drinking part would fit in the mouth; how to refill the cup

**Warning:**

- **Video / animated simulation only if prototyping is absolutely not possible.**
- **Video / animated simulation must be logical and convincing that the invention works.**
- **Constraints must be clearly included in the logbook or the project will be heavily penalized.**

## 5. References

Read <http://www.bibme.org/citation-guide/apa/> on how to cite references.

### 6 A Citation of the references we have used for the project work.

National Institute on Aging. (n.d.). Parkinson's Disease. Retrieved March 30, 2021 from

<https://www.nia.nih.gov/health/parkinsons-disease#:~:text=Parkinson's%20disease%20is%20a%20brain,have%20difficulty%20walking%20and%20talking>

Caroline, M. (2014, June 6). Brilliant 11-Year-Old Designs An Unbreakable, Spill-Proof Cup For Her Ailing Grandpa. Retrieved from

<https://www.businessinsider.com/unbreakable-kangaroo-cups-2014-6#:~:text=It's%20called%20a%20Kangaroo%20Cup.%2D%20or%20two%2Dhanded%20grip.&text=The%20above%20version%20of%20the.out%20of%20BPA%2Dfree%20polypropylene>

Mileha, S. (2015, July 24). No Spill Cup. Retrieved from

<https://www.behance.net/gallery/28176845/No-SPILL-Cup>

Active Hands. (n.d.). Hand Steady Mug. Retrieved March 30, 2021 from

<https://www.activehands.com/product/hand-steady-mug/>