

Category 4 Resource Development

The Science Centre Project

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ABSTRACT

The Science Centre Project was started in collaboration with Science Centre Singapore, in order to help improve their “Singapore Innovations” exhibition. The exhibition consisted of static life hacks created by Singaporeans. The exhibits were placed inside viewing chambers and hence they have little appeal to visitors who were more attracted to open exhibits. To give dynamism to the life hacks exhibits, we decided to set up two interactive booths at Science Centre Singapore, . We demonstrated the use of life hacks, personally explained their working, and invite the visitors to try out the life hacks for themselves. Through these interactive features, we were able to attract significantly more visitors to the “Singapore Innovations” exhibition.

1. INTRODUCTION

1.1. Rationale

During our initial visit to Science Centre Singapore to decide which exhibition could be best improved on, we found out that the second floor of the atrium was rarely visited by people. On the second floor, we found the “Singapore Innovations” exhibition. Although it was interesting and provided viewers with many useful life hacks for their daily lives, few people actually stopped to take a look at the exhibition, due to the lack of people going to the second floor in the first place. As a result, our project was started to increase the number of visitors to “Singapore Innovations”.

1.2. Objectives

We came up with the following objectives for our project:

- Increase flow of visitors to the “Singapore Innovations” exhibition,
- To change static exhibits to dynamic experiences,
- To learn the science behind the Life Hacks through fun play.

1.3. Target Audience

Our target audience were the members of public who visited Science Centre, especially younger audiences, whose age ranged from 7 to 13.

1.4. Resource

Our resource for our project was a pair of interactive booths. The life hacks at the booths were showcased by members of our project group. At our booths, we demonstrated on the use the life hacks, and explained how the life hacks worked. Visitors were given the chance to try out these life hacks for themselves. Each booth showcased two different life hacks. One booth was set up on the first floor to attract visitors’ attention. After the first floor showcase had ended, the visitors would be invited to visit our second level booth, where two other life hacks were showcased. At the end of the final showcase, the group members at the second floor booth would direct visitors to the “Singapore Innovations” exhibition, for their own viewing pleasure.

The life hacks showcased at the booths were:

- Water Bottle Lantern
- Stocking Vacuum Filter
- Open a Bottle Easily
- Battery Drop Test



Giggs demonstrating how the Stocking Vacuum Filter life hack is used, to a visitor of Science Centre Singapore



Zelin explaining how the Open a Bottle Easily life hack works to a group of visitors of Science Centre Singapore



Tze Yong demonstrating how to use the Water Bottle Lantern to visitors of Science Centre Singapore

2. REVIEW

Comparing the “Singapore Innovations” exhibition to the more popular exhibits, our group found that these popular exhibits often had interactive aspects which were appealing to visitors. A good example is the Tesla Coil Demonstration, where participants can volunteer to sit in a metal cage while high voltages sparks are shot at the cage. Because of this interactive and unique feature, the Tesla Coil Demonstration is able to attract at least 100 people during each demonstration. By analysing the common features of the more appealing exhibits, our group is able to formulate a plan to bring more visitors to the second level through the construction of an student-led interactive booth to showcase life hacks.

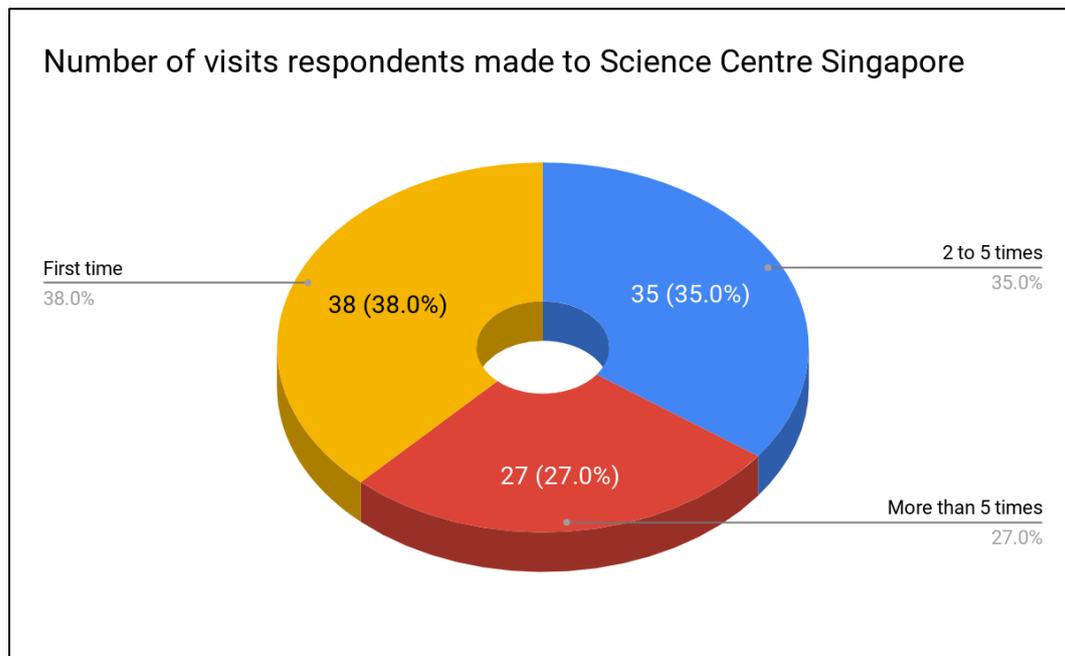
3. METHODOLOGY

3.1. Needs Analysis

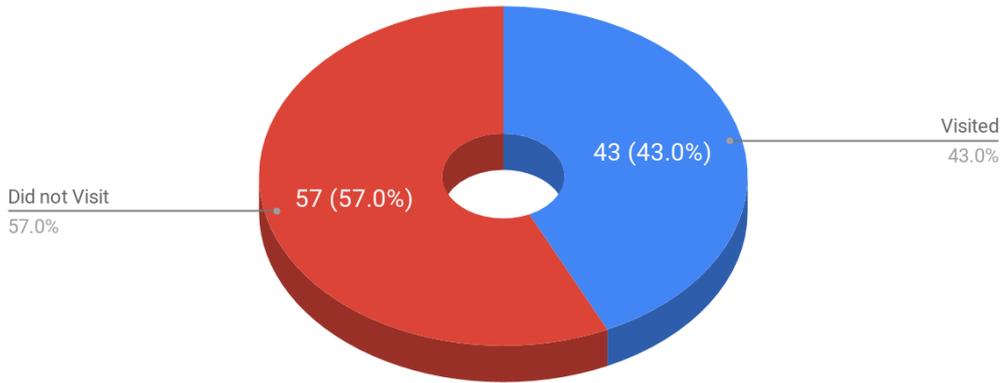
It was observed that although there were many visitors at the Science Centre, only a small proportion of them visited the second floor. A survey was conducted between 5th to 7th June 2018 to count the number of people who visited the second floor.

On 6th June 2018, we also counted the number of visitors going to the second floor throughout the day. Using the data collected, we compared it to the total number of visitors who visited Science Centre Singapore on that day. We also counted the number of people who stopped to look at the “Singapore Innovations” exhibition and compared the number to the number of people who went up to the second floor. We present our findings in the following section.

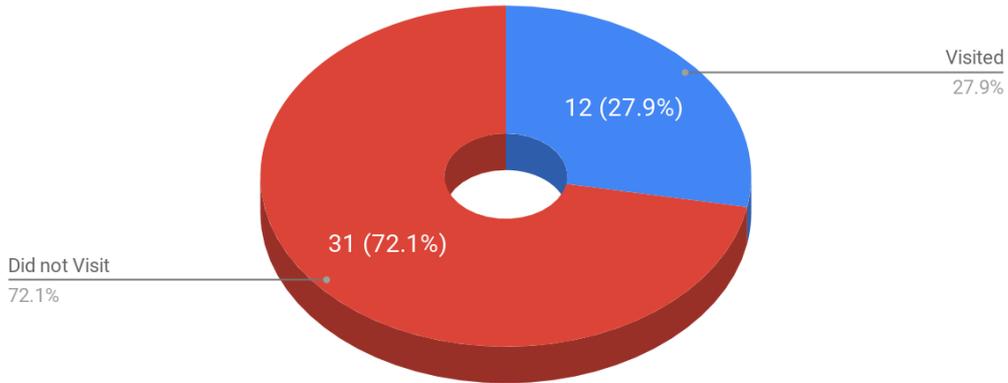
3.2. Survey and Observation Results

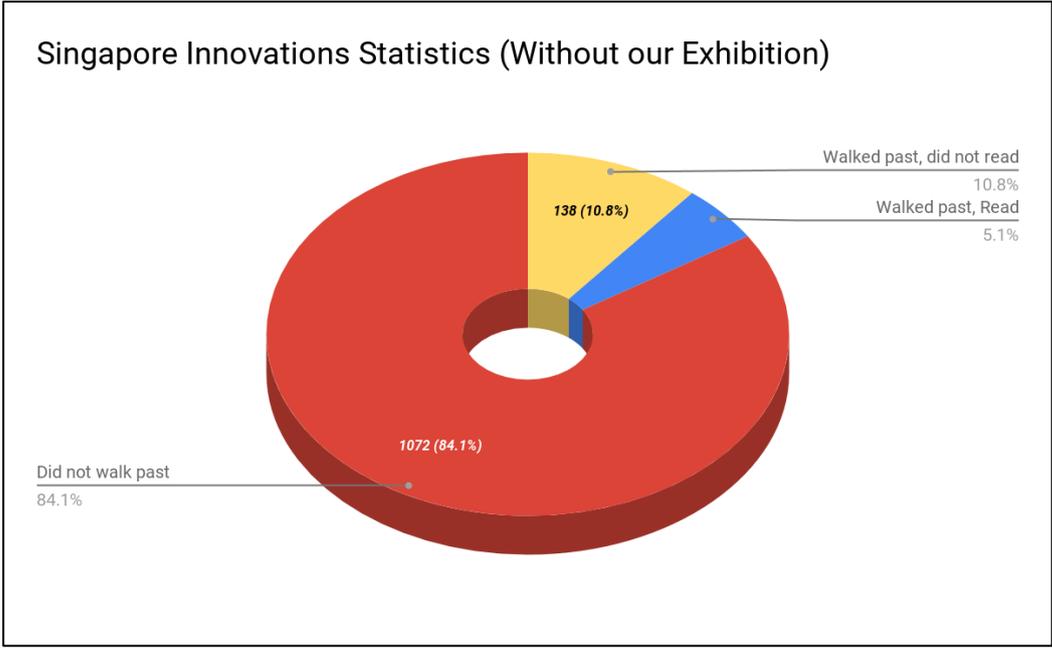


Number of respondents who have visited the second floor of the atrium



Number of respondents who have visited "Singapore Innovations" before, of the 43 who have gone up to the second floor





Our survey results show that, out of 100 surveyed, 62 had visited Science Centre Singapore at least 2 times. Yet, only 43 of the 100 surveyed had visited the second floor of the atrium. This survey indicates that a large majority of visitors did not visit the second floor, either because they did not know how to, or because they were not interested in the exhibitions up there. Out of the 43 who did visit the second floor, only 12 stopped to look at the exhibition. This shows that only a small percentage of people (12% of 100) were interested to look at the exhibition.

Together with our whole-day counting on 6th June, only 65 out of the total 1278 people who visited Science Centre Singapore visited and read the “Singapore Innovations” exhibition. This worked out to 5.1% of the total number of visitors which, by any count, is a very small percentage.

3.3. Development of Resources

We created three new life hacks from scratch, and improvised one life hack from the “Singapore Innovations” exhibition.

1. Water Bottle Lantern



(a) A regular beam of light travels in a straight line, illuminating only a small area

(b) After placing a water bottle above the light source, light is evenly distributed around the water bottle. This is because water refracts the light rays when the light rays travel to the optically denser medium of water.

(c) The green water bottle produces green light, which is more pleasing to the eye. Green light is more sensitive to the human eye, due to its position in the visible light spectrum, where it is in the middle.

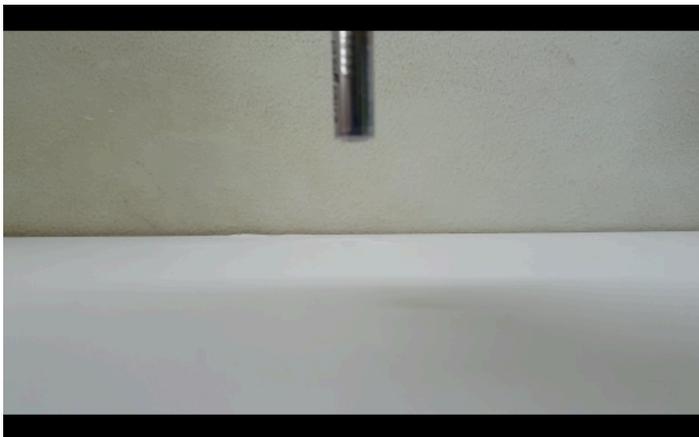
2. Open a Bottle Easily



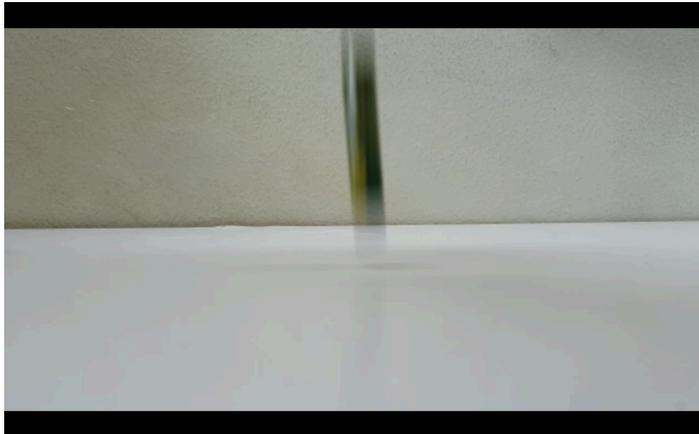
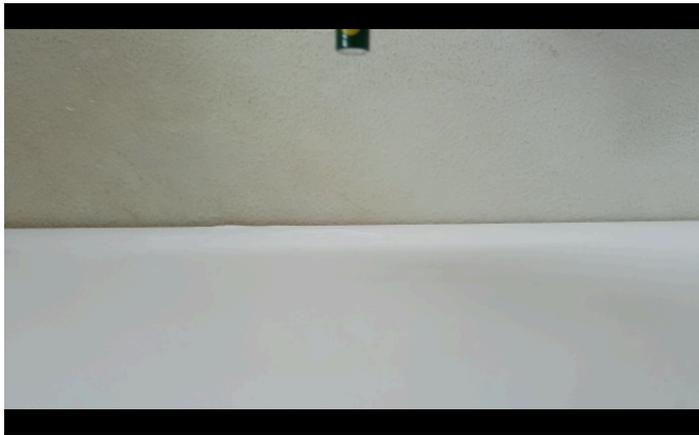
A rubber band or cloth can be used to open a bottle more easily if it is too tight. The rubber band or cloth produces more friction when trying to open the bottle, which can then increase clockwise torque, thus opening the bottle easier

3. Battery Drop Test

The test is used to check whether a battery is depleted or not, just by dropping it onto a hard surface, from a height



Left: Video of an unused battery not bouncing off a table after being dropped from a height



As batteries discharge, zinc oxide coats the surface of the batteries. The zinc oxide forms around the zinc particles embedded in the gel, slowly turning the gel to a ceramic. While the material starts as tightly packed particles, the oxidation process forms tiny bridges between them, producing a material a bit like a network of linked springs, which gives it bounce.

Left: A depleted battery bouncing off a table after being dropped from a height

4. Stocking Vacuum Filter



A sock or stocking is put over the mouth of a vacuum cleaner. Like a piece of filter paper, the stocking or socks acts as a filter, trapping valuables while allowing air and dust particles to pass through.

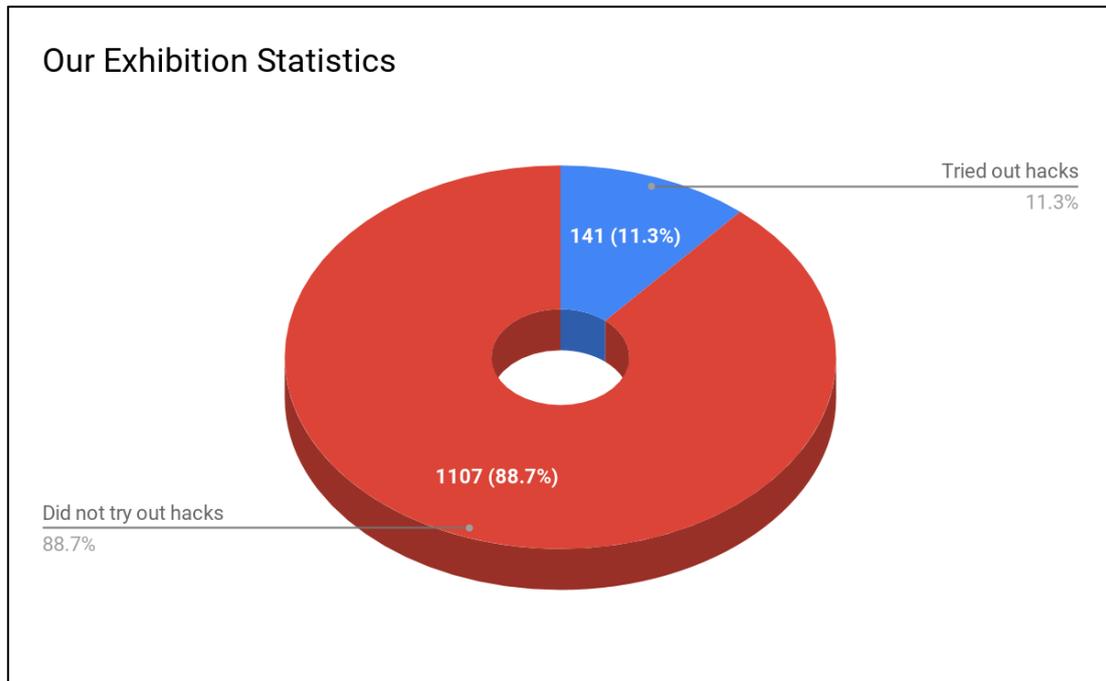
Above: Stocking Vacuum Cleaner is able to filter a dropped pin

3.4. Pilot Test

We ran a pilot test under the guidance of our mentor on 4th June 2018 in the High School Science Laboratory to make sure that our research on the Science behind how the life hacks worked was accurate. Furthermore, Science Centre Singapore reviewed our project and deemed it fit for public presentation. To further prepare us for the actual interaction with the public, Science Centre Singapore gave us courses on public interaction and communication.

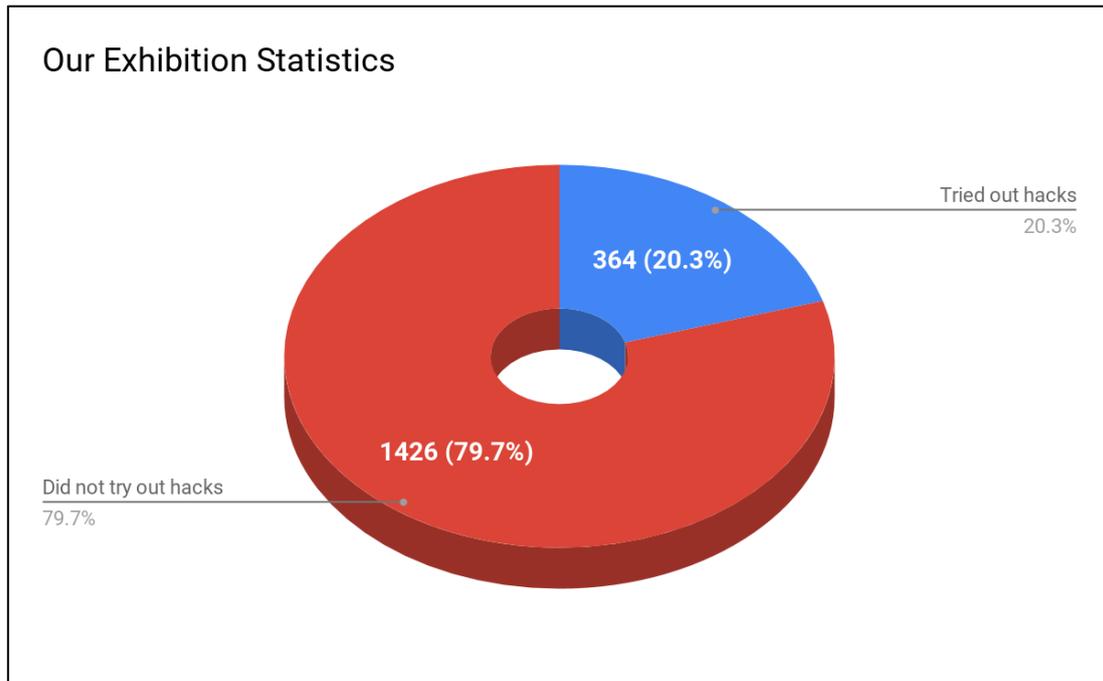
4. OUTCOME AND DISCUSSION

We ran our interactive booths on 12th and 20th June 2018. The following graph shows our results:



Day 1 Statistics

Number of people who visited our booth, compared to the total number of visitors of Science Centre Singapore that day.



Number of people who visited our booth, compared to the total number of visitors of Science Centre Singapore that day

Day 2 Statistics

From the statistics, our project was a success. We were able to double and quadruple the percentage of visitors who read the "Singapore Innovations" exhibition. There was an increase of from 5.1% without our exhibition, to 11.3% and 20.3% on Day 1 and Day 2 respectively.

We also achieved our objectives of increasing flow of visitors to the "Singapore Innovations" exhibition, allowing visitors to try out life hacks through hands-on experiences, allowing visitors to learn the science behind these "Life Hacks" and showcasing creative thinking skills of Singaporeans.

5. CONCLUSION

Our project was rather challenging in the sense that as we are leaving the comfort zone of the school to work with a well-known public institution. . Communication was at times inconvenient as we had to meet very tight schedules, starting from the preliminary investigations, meeting the science centre partners, conducting public surveys, creating and testing our life hacks, training in public communications and carried out our project, all within the space of one month. Interacting with members of the public was a new experience for our team. We had to look past our fear of talking to strangers and remember that we were representing Hwa Chong. We can say that we have learnt to be more independent by working with the Science Centre. Moreover, by interacting with members of the public, we were also able to improve our people skills, communication skills, as well as our self-confidence. This experience was truly unique and we are more confident and independent than when we first started this project.

6. ACKNOWLEDGEMENTS

We would like to thank the following people for their help throughout our project's journey, without whose help the project would have never been able to succeed.

Science Centre Singapore for giving us the chance to collaborate and improve one of their exhibitions, the very basis of our project;

Ms Anne Dhanaraj and Ms Lim Su Ru, staff from Science Centre Singapore, for coordinating us with Science Centre Singapore, and providing us with the logistics and valuable training and for our booths;

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Ms Nada Nurwani Ng for opening up the opportunity to us work with the Science Centre;

Mr Sim Mong Chea for his mentorship throughout our project, and for providing us with guidance and scientific knowledge when needed;

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