



PROJECT i-ENGINEERING Post Workshop Report (Bitty-Q Pit)

EWB-SG/2015/0011
30-Aug-15



Engineers Without Borders (Singapore)

.....
NG SAYE PHIN
PRESIDENT
ENGINEERS WITHOUT BORDERS (SINGAPORE)

Engineers Without Borders (Singapore)

.....
SERENE KOH SZE LING
SECRETARY
ENGINEERS WITHOUT BORDERS (SINGAPORE)

PROJECT i-ENGINEERING
Post Workshop Report
(Bitty-Q Pit)

A report submitted in fulfillment of the workshop with Tanjong Pagar Youth Executive Committee, Singapore on 2-Aug-15 at Tanjong Pagar CC to kindle engineering interest with young children (ages 7 – 11).

30-Aug-15

Partners:



Tanjong Pagar Youth Executive Committee

Tanjong Pagar Youth Executive Committee, under the umbrella of Tanjong Pagar CC Youth Club and part of the People's Association Network is a youth club that aimed to promote friendship, develop talents, channel energies, explore potentials and encourage leadership skills.

Special Thanks:



Grant Thompson - "The King of Random"

<http://www.thekingofrandom.com>

An online channel exploring life through projects, experiments and real-world live hacking.

ABSTRACT

In fulfilment of our objective in engaging the local communities with worthwhile engineering-based projects, efforts were made to reach out to local organisations.

Tanjong Pagar Youth Executive Committee, under the umbrella of Tanjong Pagar CC Youth Club and part of the People's Association Network is one such organisation. It aimed to promote friendship, develop talents, channel energies, explore potentials and encourage leadership skills. Tanjong Pagar Youth Executive Committee has an on-going program with selected children named Nurture@Tanjong Pagar. The program focused on giving free education help to selected groups of children from low income families living in rental apartments. Classes in English language, Math, etc. are conducted twice a week. Besides academic remedial help, the club also organises education road trips to local attractions like the Marina Barrage Urban Reservoir, etc. for those children.

Hence, after discussion with Tanjong Pagar Youth Executive Committee, Engineers Without Borders (Singapore) decided to add on the Nurture@Tanjong Pagar program by introducing engineering based workshops under the **Project i-Engineering** series.

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
ABSTRACT	i
LISTS OF FIGURES	ii
ABBREVIATIONS	ii
ACKNOWLEDGEMENT	iii
CHAPTER 1 INTRODUCTION	1
1.1 Prelude	1
1.2 Objectives	1
CHAPTER 2 IMPLEMENTATION	2
CHAPTER 4 LESSONS LEARNED	4
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	5
REFERENCES	6
APPENDICES	7

LIST OF FIGURES

Figure	Description	Page
1	Briefing the children on the workshop	2
2	Assisting the children during fabrication stage	2
3	Completion of the Bitty-Q BBQ Pit	3
4	Barbequing using the Bitty-Q BBQ Pit	3

ABBREVIATIONS

Abbreviation	Description	Page
EWB-SG	Engineers Without Borders (Singapore)	1
TPYEC	Tanjong Pagar Youth Executive Committee	1

ACKNOWLEDGEMENT

We would like to take this opportunity to express our deepest gratitude and appreciation to the following groups and individuals for their invaluable help and support along the course of this project. The project would not be successful without them.

Firstly, we would like to thank Shawn Soh, Chairman of Tanjong Pagar Youth Executive Committee. Without his support and leadership, the project will not have been possible.

Secondly, we would also like to give special thanks to Lim Peiting, Assistant Secretary of Tanjong Pagar Youth Executive Committee. Without her efforts in coordinating the logistics and the parties involved, namely the volunteers from Tanjong Pagar Youth Club and Engineers Without Borders (Singapore), this project would not have progressed as smoothly.

Thirdly, we would also like to give special thanks to Engineers Without Borders (Singapore)'s Secretary Serene Koh for leading and supervising this project from the initial planning to actual implementation.

Last but not least, we will like to thank the volunteers from Tanjong Pagar Youth Executive Committee for volunteering their time to help during the actual implementation.

NG Saye Phin

CHAPTER 1

INTRODUCTION

This chapter will discuss the background of the project.

1.1 Prelude

In fulfilment of Engineers without Borders (Singapore)'s (EWB-SG) objective in engaging the local underprivileged communities with worthwhile engineering-based projects, efforts were made to reach out to local organisations in early May-15.

Tanjong Pagar Youth Executive Committee (TPYEC), under the umbrella of Tanjong Pagar CC Youth Club and part of the People's Association Network was one such organisation. It aimed to promote friendship, develop talents, channel energies, explore potentials and encourage leadership skills.

After discussion with TPYEC in May-15, EWB-SG proposed to add onto the Nurture@Tanjong Pagar program by introducing engineering-based workshops. The agreement was concluded and **Project i-Engineering** series of workshops were established. In brief, EWB-SG was to conduct the first workshop in Aug-15 and further develop 2 more workshops to be scheduled near the end of 2015 and in early 2016.

1.2 Objectives

TPYEC has an on-going program with selected children named Nurture@Tanjong Pagar. The program focused on giving free education help to selected groups of children from low income families living in rental apartment. Classes in English language, Math, etc. were conducted twice a week. Besides academic remedial help, the club also organized education road trips to Marina Barrage Urban Reservoir, etc. for the children.

Hence, with the engineering-based workshops, the objectives set out are as follows:

- a. Engage the children in underprivileged communities with engineering-based projects.
- b. Kindle engineering interest in the children through live workshops.
- c. Introduce and acquaint the children with the key characteristics of engineers - namely innovativeness, problem solving and critical thinking skills.

CHAPTER 2

IMPLEMENTATION

This chapter presents the implementation of the work. Together with the members and volunteers of TPEYC, EWB-SG team conducted the workshop on 2-Aug-15. The following were photos taken during the implementation of the project.



Figure 1: Briefing the children on the workshop



Figure 2: Assisting the children during fabrication stage



Figure 3: Completion of the Bitty-Q Pit



Figure 4: Barbequing using the Bitty-Q Pit

The implementation of the project concluded with all involved having an actual barbeque feast in Tanjong Pagar Community Centre.

CHAPTER 3

LESSONS LEARNED

A common knowledge that is shared by many is that in midst of a project implementation, problems will be encountered. In short, no project can be successful without encountering and overcoming the problems. Hence, this chapter will discuss the lessons learned during the implementation of Project i-Engineering Workshop No. 1.

Lesson Learned No. 1	During the actual implementation of the workshop, some volunteers were unsure on what to do as well as to what was required of them.
Solution:	Pre-workshop meetings with all the volunteers involved to be arranged for future workshops to minimise this issue.

Lesson Learned No. 2	During the day of the workshop, the PowerPoint presentation could not be projected on screen due to the lack of HDMI cable as well as being unfamiliar with the use of the overhead projector. Hence, the presentation was showed directly from the laptop.
Solution:	Logistics check prior to the actual project implementation to be arranged for future workshops to minimise this issue.

Lesson Learned No. 3	During the actual fabrication of the Bitty-Q pits, a lot of steps had to be completed by the volunteers first, to ensure the children's safety. This caused some children's attention to be diverted elsewhere.
Solution:	Diligent research for new projects needs to factor in DIY projects where children can be involved right from the start.

CHAPTER 4

CONCLUSION

This chapter concludes the Project i-Engineering workshop. The project satisfied all areas and below project objectives have been met:

- a. Engage the children in underprivileged communities with engineering-based projects.
- b. Kindle engineering interest in the children through live workshops.
- c. Introduce and acquaint the children with the key characteristics of engineers - namely innovativeness, problem solving and critical thinking skills.

REFERENCES

World Wide Web

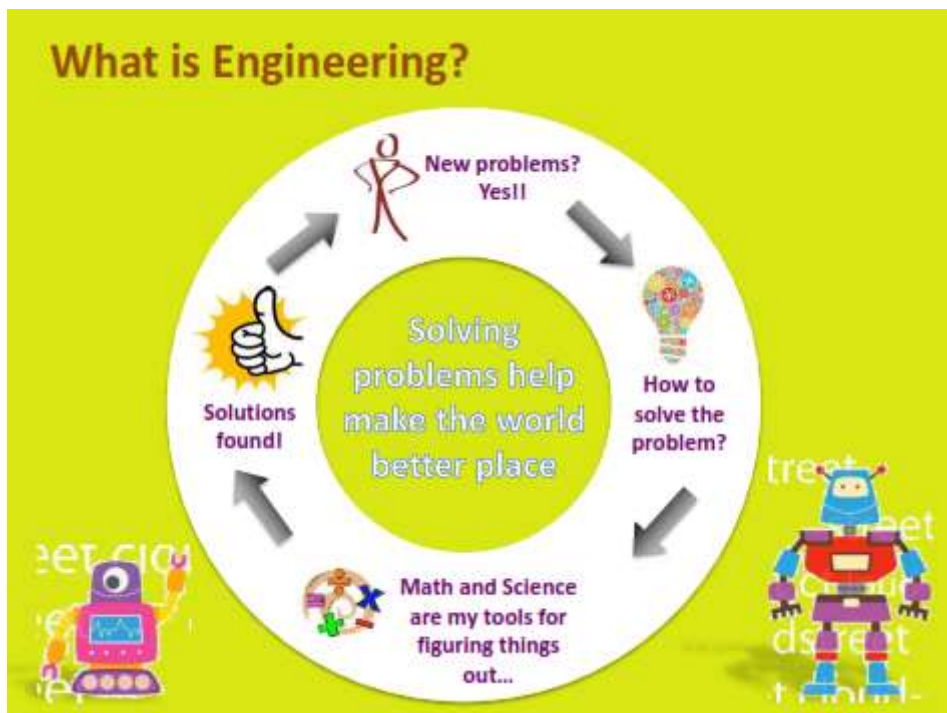
YouTube, 2005, How to Make the Bitty-Q - (A Drink-Can BBQ), viewed on 2-Jun-15

<https://www.youtube.com/watch?v=wGtPMBEVXT8>

Posted by Grant Thompson - "The King of Random. An online channel exploring life through projects, experiments and real-world life hacking.

APPENDICES

i-Engineering Workshop No. 1 - Power Point Presentation



How to bbq without a pit?

Some solutions:

Just buy one! Book from RC (HDB bbq pits)

Borrow from friends/families?

Rent from somewhere?



How about **BUILDING**
your own bbq pit?



Sourcing the correct materials

Question 1:

What sort of material is good for conducting heat
(transfer of heat)?

Insulators

Wood • Plastic • Rubber • Glass

Conductors

Metals



How?

Metals conduct heat well for two reasons:
metal ions pack very closely together in their
molecular lattice, and electrons drifting through the
metal carry kinetic energy around the lattice.

Question 2:

Where can you easily find metal containers
that you can use for this project?



Introducing the Bitty-Q pit!

Let's get started!



Make sure you have these materials:

- 1) Empty cans (already cut – be careful!)
- 2) Wire clothes hangers (for the grill plate) / wired grill mesh (already cut)
- 3) Sand paper (to sand off any plastic / film on the wire hangers)
- 4) Wire Cutters (to bend the hangers)
- 5) 4 nos 4-inch U-Bolts / 4 nos 65mm length bolts and 8 nuts (for bbq stand)
- 6) 1 no 1-inch utility hinges + 4 nos screws and nuts (for cover)
- 7) 1 no Strap Loop + 2 nos screws and nuts (for the handle on cover)
- 8) Gloves
- 9) Markers – raise up your hand when you need them
- 10) Scissors – raise up your hand when you need them

Step-by-Step Instructions

- Step 1: Work on your cover**
- Step 2: Measure and draw all the holes**
- Step 3: Go to station to poke the holes**
- Step 4: Put in all the legs and screw tightly**
- Step 5: Place hinge on the can**
- Step 6: Put strap loop on the cover**
- Step 7: Connect cover to the can**
- Step 8: Proceed to bbq area!**
- Step 9: Collect HOT coals + wire mesh**
- Step 10: Enjoy your bbq!**

i-Engineering Workshop No. 1 – Bitty-Q Pit (Step-by-Step Instructions)

Step 1: Work on your cover. Cut and fold it into required shape/size

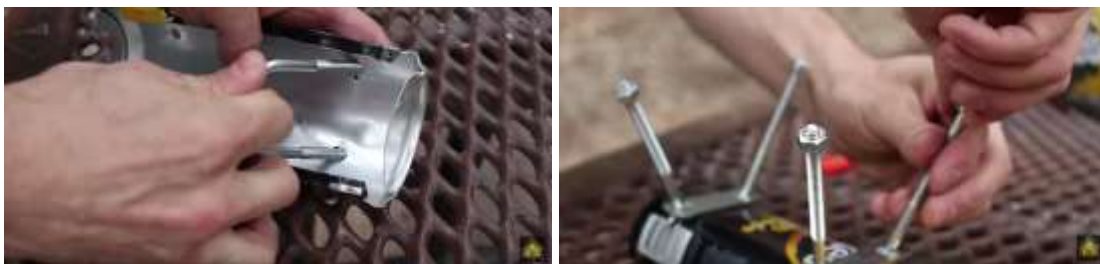


Step 2: Measure and draw all the holes

Step 3: Go to station to poke the holes



Step 4: Put in all the legs and screw tightly



Step 5: Place hinge on the can

Step 6: Put strap loop on the cover



Step 7: Connect cover to the can



Step 8: Proceed to bbq area!

Step 9: Collect HOT coals + wire mesh



Step 10: Enjoy your bbq!



Source: <https://www.youtube.com/watch?v=wGtPMBEVXT8>