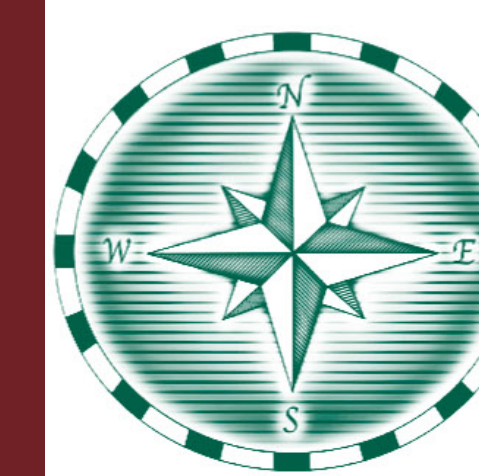




# Maker Learning: Exploring Change in the Process

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# IBSC

## Introduction

### The Need to Develop Maker Learners

St John's Prep offers Design & Technology for all boys as part of the weekly timetable. These classes take place in the Design & Technology Centre, a large creative space.

A need for a better quality final product and a better understanding of the design process was identified. It was hoped this might be improved through the use of deliberate reflection and multiple iterations during a Maker project.

During my early research, I discovered a variation to the design process from IDEO and adapted it slightly to suit the project. I thought a deliberate change to the way in which the boys work through the design process for projects might enhance their learning, and lead to better quality final product.

## The Research Question

How might a deliberate focus on the steps of the design process deepen learning in a Maker project for Grade 6 boys?

## Research Context

St John's Preparatory is an independent Christian school located in Johannesburg, South Africa. From Grades 3 to 7 we have 380 boys who we prepare for entry to St John's College.

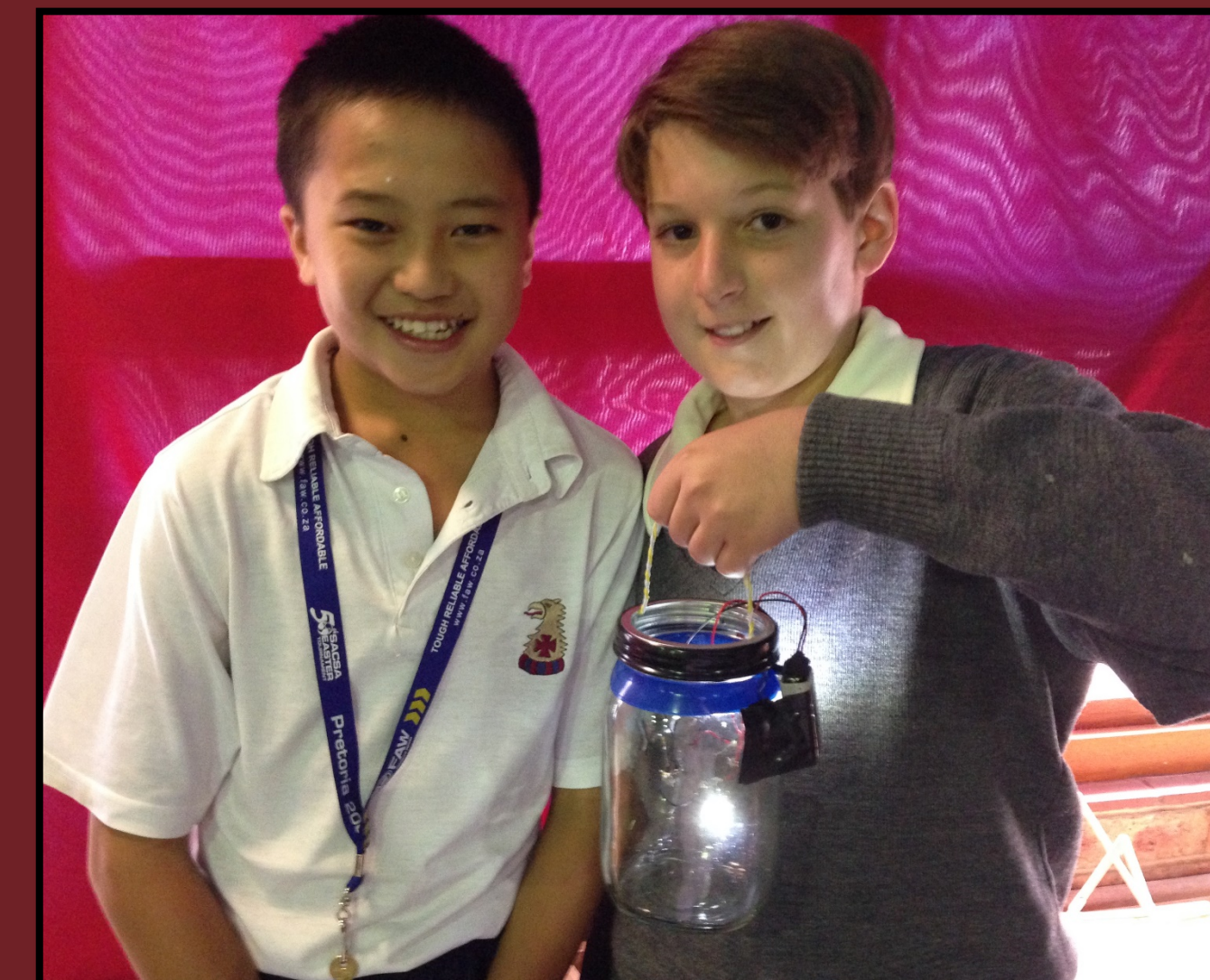
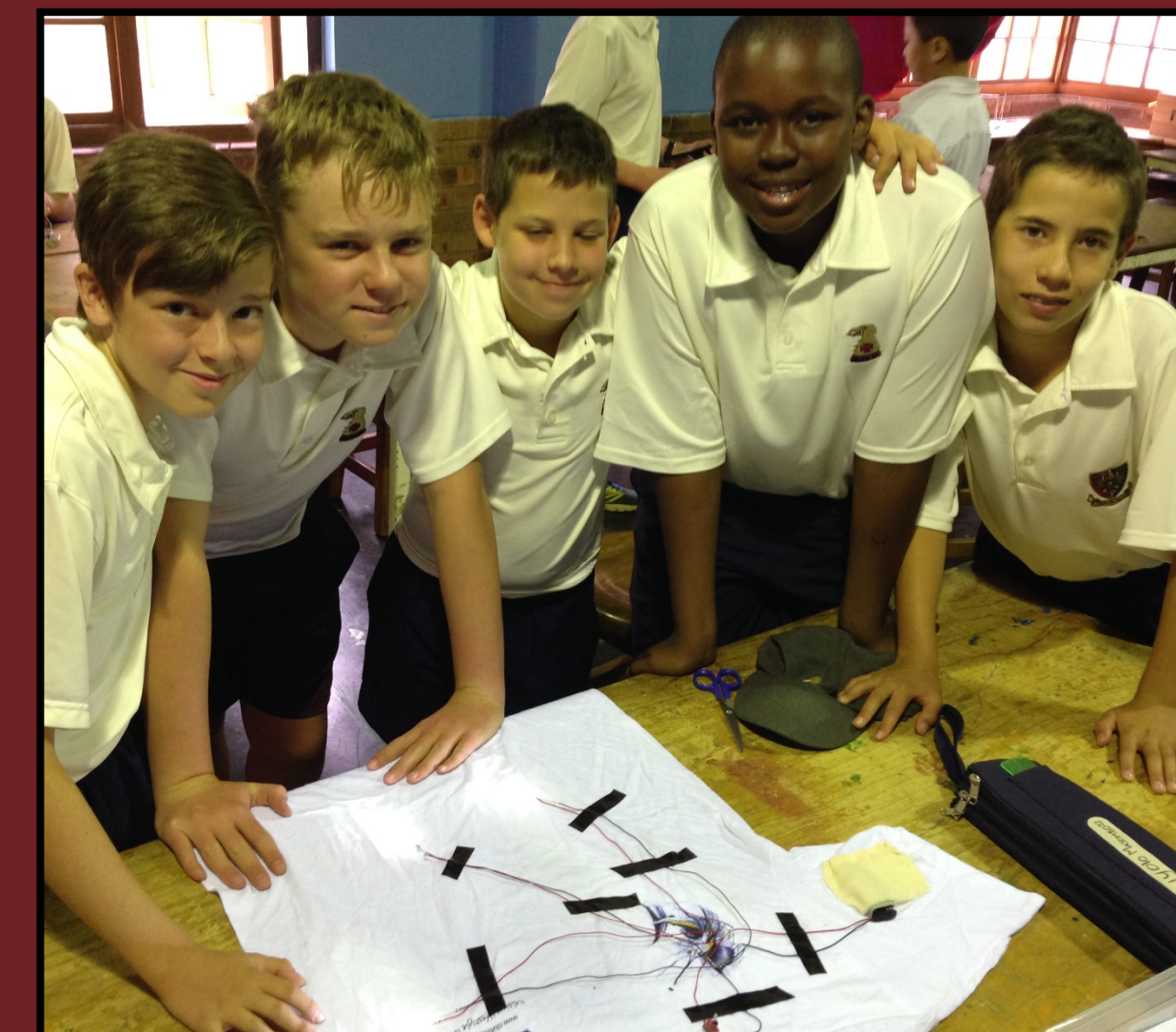
## Participants

26 Grade 6 boys of mixed ability took part in the research study. These boys were selected as they had completed their electrical circuits theory and needed to conclude the section with a practical project.

## The Research Action

This project presented a deliberate change to the way in which projects have been approached and worked through for the participating Grade 6 boys.

- The boys were presented with an open-ended problem
- The steps of the design process were changed, in both name and function. The new steps include **Ideation**, **Research**, **Experimentation** and **Evolution**
- Boy grouped themselves by common idea
- Boys were encouraged to make several iterations of their product
- These were then self-evaluated and through a process of evolution, a final product was created



## Data Collection

- Questionnaires
- Interviews
- Focus groups
- Teacher observation
- Photos & video footage

Evolution

Ideation

The Design Process

Research

Experimentation

## Data Analysis

- Answers to digital questionnaires, transcribed interviews and focus group discussion were printed out
- Boys' answers to questionnaires were analysed
- Common themes were identified
- Comments relevant to the design process were highlighted
- Relationships between themes were sought

## Key Findings and Discussion

- By changing the **DESIGN PROCESS** (Ideation, Research, Experimentation and Evolution) the boys felt a positive mindset shift. 19 out of 25 boys were excited about the change to the design process.

"I think it is exciting that we are trying something different" Boy R

"It is a lot more comprehensive than the old design process" Boy C

- The project was designed to be **OPEN-ENDED**. The boys were informed that any solution that solved the problem would be accepted. The boys found that they felt encouraged to be creative without being judged.

"We are brainstorming for exciting and creative ideas" Boy B

"I think there will be more of a variety of projects" Boy M

- The boys then formed their own **SMALL GROUPS** of two or three, according to common project interest. A major change to the norm.

"They are all thinking along the same lines as me" Boy C

"We don't have to shout because we both have the same idea" Boy B

- Through **EXPERIMENTATION** and by producing two or three iterations of their ideas gave the boys licence to learn by making. They were then able to hone their ideas and produce a refined final product.

"This is like inventing something completely new" Boy D

"Like a brainstorm, we just put a bunch of ideas together" Boy C

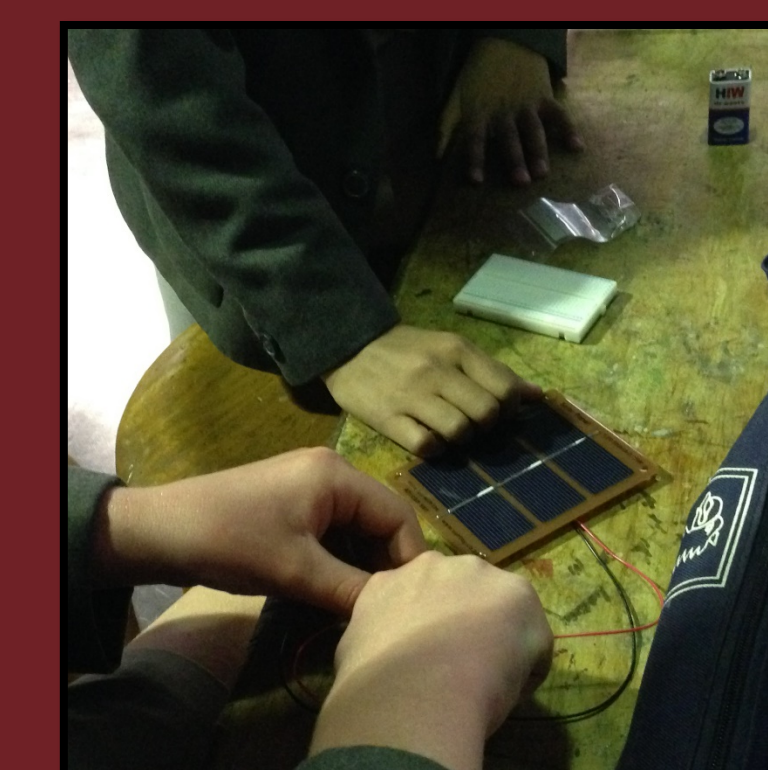
## Conclusions

- The boys felt that the change in the design process allowed them to develop their creativity
- We need to encourage our project designers to formulate simple problem statements that the boys will enjoy solving
- It is perfectly acceptable to have a variety of solutions for a particular problem
- Thorough planning and development of projects is essential for the enhanced learning of boys
- Clear and precise scaffolding enables the boys to understand the process they are expected to follow
- Boys enjoy making!

"I think I have been the most creative as safely possible" Boy C

"It helped me to understand the project" Boy K

"It showed that it's okay to be different, and to show others what you like, and that we don't need a teacher holding our hands" Boy S



## Key Readings

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## Further Information

This poster and further information is available at <http://www.theibsc.org>

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Research Blog: <http://jongunning9.edublogs.org>