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 that this might be improved through the use of deliberate reflection and multiple iterations during a Maker project.

Research Context

St John’s Preparatory School 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.

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?

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 boys were encouraged to make several iterations of their ideas
• They then formed their own small groups of two or three, according to common project interest
• A major change to the norm
• Through experimentation and by producing two or three iterations of their ideas, the boys gave the boys licence to learn by making. They were then able to hone their ideas and produce a refined final product.

Data Collection

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

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.

The Design Process

• 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.

• The boys then formed their own small groups of two or three, according to common project interest. A major change to the norm.

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

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
• Through 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

Key Readings


Design Thinking for Educators – IDEO http://designthinkingforeducators.com

Further Information

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