Introduction

This action research was undertaken to see if boys involved in Maker Learning projects developed the skills and understanding to take risks, achieve more challenging outcomes, and enhance learning. It has been my experience that there are a variety of reasons that result in boys ‘playing it safe’ or not fully engaging in their projects. By restructuring the teaching and learning to provide a safe environment and embracing the concepts of Maker Learning, I hoped boys would take greater risks to test ideas. This research took part during a unit on creativity and innovation so concepts of taking chances and experiencing failure as part of learning framed student thinking.

The Research Question

How can a safe classroom environment impact Intellectual Risk-taking and engagement when year 9 boys are undertaking Maker Learning projects of 3D structures?

Research Context

Lindisfarne College is a Year’s 7–13 integrated boys’ school founded under the auspices of the Presbyterian Church. It is situated in the city of Hastings, in the province of Hawke’s Bay, New Zealand. It caters to both boarders and dayboys. Of the 500 students, half are full or weekly boarders for whom the College is both their place of residence and their learning.

Participants

In this action research project I chose a Grade 9 Technology class (age 12–13); the class has 24 students and is streamed (B stream). This class allowed for the flexibility required to teach a different unit of work to other classes and also due to the absence of national examinations at this age. Within this class I used 10 students as the main participants for the action for interviewing and video footage requirements.

The Research Action

Students undertook a Maker curriculum unit on Creativity and Innovation. Students explored a range of possibilities when faced with a design problem.

- Development of the safe environment; rules established by the students so they found the optimum circumstances (safe environment) for creative productivity. Silent Design Stage, Positive Participation, No response is wrong Philosophy.
- Identifying as a Maker; Student reflection and discussions around each maker activity exploring concepts of divergent thinking, productivity and collaboration.
- Maker Projects; Product Disassembly, Space Station Construction

The critical thinking included concepts of compartmentalisation and redundancy along with environmental issues of power and space debris were evidenced in the models made from card, tinfoil and recycled material.

Data Collection

- Pre-Survey
- Group and individual interviews
- Video and recorded information
- Teacher reflections

Data Analysis

- Interview responses were copied verbatim from video footage as supporting student voice statements.
- Video footage was previewed and clips were noted by time frame to denote an aspect of the indicators below.
- Teacher reflection diary grouped under themes; key aspects supporting intellectual risk-taking were noted.
- Information gathered in the video interviews was unitized and grouped according to the headings below as key indicators of Intellectual risk taking (E.T. Stringer 2014):• Task enjoyment and fun.
  • When students took the greatest risk in class.
  • What gender creativity/risk taking?
  • What were background attitudes to making/tinkering?

Key Findings and Discussion

- All students actively engaged and very proactive in construction process, wide variety of solutions with some observing use of materials by others and using methods themselves.
- Collaborative discussions regarding what their station parts do and uses in space.
- Lots of laughter, visible enjoyment, industrious activity. Movement around room purposeful seeking materials and equipment.
- Group of students returned at lunchtime and after school to work on their designs. Had to send them out on Friday so I could go home, after school for 1 ½ hrs. of construction.

Key Readings


Data

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Conclusions

• All the boys interviewed were certain that the physical modelling and positive environment enabled them to take greater risks in class.

• While some boys felt the environment was a key benefit, all referred to the engagement and ownership of their personal ideas and designs as important in final project outcome.

• Maker Learning, combined with both practical hands on construction and reflection time provides the bridge between the physical and intellectual requirements boys have to learning. The boys often referred to how, as younger boys, they enjoyed and engaged in ‘tinkering’ at home and in school. As this was often supported with praise, a positive memory was formed.

• A greater focus on modelling and ‘hands on thinking’ is an important part of the thinking process. A safe and enjoyable environment coupled with challenge and the competition of completing maker projects enhances student experiences in our classrooms today.

Further Information

This poster and further information is available at http://www.theibsc.org/
Researcher’s Email: rennie.d.d@lindisfarne.school.nz
Researcher’s Blog site: http://drennieibsc.edublogs.org