



Preamble: Year 8 Design Challenge 2013

"That the borders of our minds are ever shifting, and that many minds can flow into one another, as it were, and create or reveal a single mind, a single energy" (Yeats)

The Design Challenge was developed collaboratively by the Technologies KLA and conducted as a pilot unit. Essentially, the unit was conceived through the faculty questioning the assumptions upon which industrial models of teaching and learning are based. The underlying motivation for this questioning stemmed from a shared passion to trial strategies that would improve student learning outcomes. The Design Challenge involved:

- Inaugurating a community-based partnership that would sponsor rewards for excellent design work.
- Researching a needs-based environment and gaining permission to use it to glean clients.
- Allocating students to gender-based, **autonomous design teams** where they were designing with people they would not normally work with.
- Providing design teams with a real-life client whose **needs** enabled the formulation of an individual design brief. Clients were residents of Avondale Retirement Village.
- Creating a learning environment where classes did not exist. Management and interpretation of the design process was governed by design teams **consulting** with any of the 4 technology teachers to realise a final solution.
- Heightening expectations** of design teams to provide ongoing documentation of the design work being conducted.
- Hosting periodic meetings where team captains could dialogue over issues with their team and progress in the design activity.

Aims of the Design Challenge:

- Investigate whether **student engagement** changes when design activities are based on the real-life needs of a client.
- Observe the **management processes** students adopt when designing/working together in autonomous design teams.
- Study the changes, if any, to the quality of design work when students are placed in a **collaborative** environment and many minds combine to satisfy a need.
- Explore the strategies teams use to identify, communicate and hence solve problems. Is there evidence of **heutagogy**?
- Observe whether **competition** changes student work ethic.
- Analyse anecdotal evidence and student results to determine differences.

Conclusion

Qualitative and quantitative data has been gathered and analysed. The reasons for this are:

- to determine whether the aims of the Design Challenge were realised;
- to inform the Technologies KLA and the ARV of the advantages of the Design Challenge initiative;
- to highlight elements of the Design Challenge that can be modified to further improve student learning outcomes.

In terms of the **qualitative data** the following conclusions can be drawn:

- All aims of the Design Challenge were successfully realised during the pilot unit (supporting evidence is found in 'Anecdotal evidence' and 'Highlights').
- The Design Challenge pilot unit provides the Technologies KLA with a framework upon which to develop a contemporary model of teaching and learning. Compared to traditional methods of education, there is evidence to show this new model has improved alignment with the pedagogical dimensions of the QTM.
- The Design Challenge pilot unit is a successful example of Professional Learning in action. Faculty members reflected on professional practice, worked together and shared ideas, and focussed on improving student outcomes. Teacher capacity and professional culture was enhanced.
- Mutual benefits were prevalent in the Avondale School ↔ ARV learning partnership.

In terms of the **quantitative data** the following conclusions can be drawn:

Based on the recommendation made by Mr. A. Hibbard, the assessment of student learning in the Design Challenge needs to be reconsidered/redeveloped. The following observations are proposed areas for change due to the null hypotheses being untrue:

- The skill component needs to be assessed collaboratively. Having one teacher in charge of assessing this component is biased.
 - The design component needs to be assessed collaboratively. Having one teacher in charge of assessing this component is biased.
 - Marks for Rotations 1 and 2 need to be moderated.
- From these significant areas of change one can propose the following questions as stimulus for departmental discussion (they are not exhaustive):
- Do we continue assigning group marks to individual students for the 'skills' and 'design' dimensions? (reduce difficulty in analysing group vs individual performance)
 - Do we include 'skills' as part of the 'design' dimension marking criteria for Rotation 1 and 2, and the Design Challenge? (to reduce bias and encourage folio development)
 - How do we get all Yr 8 classes on at the same time?
 - Do we use the design diary as the task for the 'design' dimension?

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| | Food Mean | Robotics Mean | Textiles Mean | Timber Mean | Design Challenge Mean |
|---------------------------|-----------|---------------|---------------|-------------|-----------------------|
| Design Component (/30) | 18.5 | 19.7 | 19.9 | 21.9 | 20.3 |
| Knowledge Component (/20) | 12.2 | 14.3 | 12.3 | 13.3 | 13.6 |
| Skill Component (/50) | 36.5 | 39.9 | 40.7 | 40.5 | 38.7 |

Table 2: Comparison of means

| | Food vs Design Challenge | Robotics vs Design Challenge | Textiles vs Design Challenge | Timber vs Design Challenge |
|---------------------|--------------------------|------------------------------|------------------------------|----------------------------|
| Design Component | 5.88% | 52.11% | 67.16% | 1.50% |
| Knowledge Component | 2.39% | 28.67% | 6.93% | 60.56% |
| Skill Component | 4.28% | 28.67% | 11.27% | 3.89% |

Table 1: Probabilities that the null hypotheses are true. (A value of 5% or greater suggests that there is no significant difference between the means. Any actual difference is likely to be due to chance.)

The Year 8 Design Challenge activates all dimensions of the Quality Teaching Model and is an excellent fit to all the models of critical and creative thinking I have researched. Dr. G A Faull PhD