Wishful Thinking:
Developing students’ capacity to evaluate
in design and technology

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- Design & Technology Educator for 10 years.
- Passionate about social justice and gender equity via making and craft.
- Amateur blacksmith.
Based in the northern suburbs of Adelaide, 16km from the GPO.

In 2015:

- Approximately 820 students
- 43% of students on School Card
- 42% Non-English speaking background enrolments, 30+ different cultural backgrounds.
- 5% Aboriginal enrolments
“Recognising the difficulties in achieving more equitable changes can be depressing. When teachers have ‘realistic’ expectations of what they can achieve, it can sometimes mean lowered expectations, which translates into low achievement for students. On the other hand, teachers’ utopian, emancipatory ideals can become heartbreaking self-realisations of futility, or alternative forms of domination or authoritarianism” (Thomson, 2002, p9)
“The need to delay gratification, control impulses and modulate emotional expression is the earliest and most ubiquitous demand that societies place upon their children, and success at many life tasks depends critically on children’s mastery of such self-control.”
(Moffitt et al, 2011, p. 2693)
Why does this matter?

Once you correct for the ability to “Stop and Think”, the differences between high SES and low SES student achievement largely evaporates.

(Moffitt et al., 2011)
Research Origins

Collaborative critical action research between Parafield Gardens High School and UniSA.

Social Justice, Pedagogy and the Curriculum - set out to investigate curriculum and pedagogical innovation as middle years teachers implement the Australian Curriculum in northern suburbs public schools.
Research Question

How effectively does the formative assessment tool ‘Two Stars and a Wish’ engage Design & Technologies students more consciously in evaluative processes?
2 Stars and A Wish

Students identify two positive aspects of a peer’s work, and then express a wish about what the peer might do to improve another aspect of the work.

The emphasis is on positive, forward-looking evaluation, rather than ‘criticism’.
Years 9 & 10 Content Descriptors for D&T Knowledge and Understanding, 5 of 8 begin with “investigate and make judgments…” (my emphasis). Processes & Production skills add “critique needs or opportunities” and “evaluate design ideas, processes and solutions”.

Importance of ability to ‘stop and think’ in overcoming disadvantage.

Reframing evaluation as formative and ongoing, rather than as a summative task done after practical project is completed.
Formative assessment

Formative assessment (or assessment for learning) can have significant impacts on student learning.

Teaching is a contingent activity. We cannot predict what students will learn as a result of any particular sequence of instruction.

Formative assessment involves getting the best evidence of student learning and using this to decide what to do next.

(Wiliam, 2011)
“Curriculum defines what counts as valid knowledge, pedagogy defines what counts as valid transmission of knowledge, and evaluation defines what counts as a valid realization of the knowledge on the part of the taught” (Bernstein, 1973, p. 85)
Rationale:

“In an increasingly technological and complex world, it is important to develop knowledge and confidence to critically analyse and creatively respond to design challenges. Knowledge, understanding and skills involved in the design, development and use of technologies are influenced by and can play a role in enriching and transforming societies and our natural, managed and constructed environments.” (my emphasis)
Because we all love pipe cleaners 😊

Context: Getting to know you!

Task: Make something wearable

Constraints: 3 pipe cleaners
5 minutes
Because we all love pipe cleaners 😊

Please pass your creations to the colleague on your left.

Spend about 3 minutes evaluating the work you have been given (with reference to the task & constraints), and complete the Two Stars and a Wish sheet.
Please pass your peer evaluation and return the product to the colleague on your right.

Spend a minute or so implementing any aspects of the peer evaluation feedback you’ve received, *if you choose.*
Toolbox

- Woodwork task, focused on joinery, ergonomics and usability.
- Taught over approximately 6 weeks to 2 classes of around 24 Year 9 students.
- Students have 3 learning sessions per week; 2 x 50 minutes, 1 x 100 minutes.
- ‘Box’ component was produced from given design drawings.
- Students designed their own handles and attachment method, as well as any optional additional features.
Pre-test surveying students’ current understandings of evaluation – two year 9 D&T classes; one experimental and one control.

Over 6 sessions (once per week), experimental class completed a 2 Stars & a Wish peer-assessment activity based around that lesson’s practical work. Control class undertook same project without 2 Stars & A Wish.

Post-test survey of both control and experimental classes to see what, if any, perspectives have changed.
Student pre-test responses

- **What is evaluation?** – “The word 'evaluate' means to write about what you did.”
- **What things do you evaluate?** – “I wrote about the practical of what I made and how the process works.”
- **How important is evaluation?** – “Not at all important because what is the point of writing when you never even look back, instead of rethinking you could make things to improve your skills and make it better time by time. What is the point of writing the Evaluation when you can't even use the tools or make it in reality.”
Two Stars and a Wish

# I like the wood
# I like the grain
# Should've made a dinosaur

★ good smoothing
★ glued on nicely
★ Wish I took more care into it

★ straight cutting
★ straight chiseling
★ Should of cut the joints smaller.

★ smooth surface
★ Joints are all good
★ I wish I complete it
What is evaluation? - “Evaluate means to re write what you have previously done and reflect on the way you did it”

What things do you evaluate? - “Everything, to how I cut something to the words I write. I evaluate everything I do in tech and out of tech.”

How important is evaluation? - “It is very important because you need to see what you have done good or not very good on your work so you can learn from it.”
How many times do you evaluate in a tech lesson?

Control group results

- Never: 60.00%
- Once: 40.00%
- 3-5 times: 20.00%
- 5-10 times: 0.00%
- More than 10 times: 40.00%

Colors:
- Pre-Test
- Post Test
How many times do you evaluate in a tech lesson?

Experimental group results
What’s making a positive difference?

- ALL students actually engaged with the Two Stars and a Wish activity, even students usually reluctant to write.
- Immediate feedback.
- More frequent unforced collaboration between students.
- Majority of student feedback to their peers was positive and constructive.
- Some evidence that students are applying evaluation outside of D&T.
Simple formative strategies like Two Stars and A Wish can be very valuable at gaining a quick sense of where the class is at in their own understandings of evaluation.

The brevity did not detract from the depth of thinking.

The task doesn’t need to be onerous to achieve change.

With practice, students will apply this simple method to improve their own work, and begin to appreciate its role in their lifeworlds.
Thank you

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