Workshop: Fostering Creativity in the Classroom: Devising Exercises that Develop the 12 Habits of Creativity

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The *Habit* of Creativity

- **Sternberg (e.g. 2007*) has described creativity as a habit.**
- **"*Creative people are creative largely not by any particular inborn trait, but rather, because of an attitude toward life: They habitually respond to problems in fresh and novel ways*…"***
- **"Encourage/discouraged through":**
  - Opportunity,
  - Encouragement,
  - Reward.

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*Sternberg, R. J. (2007), Creativity as a Habit, in A-G. Tan, *Creativity: A Handbook for Teachers*, pp. 3-25. World Scientific Publishing

Sternberg's 12 Keys to Developing the Habit

1. **Redefine Problems;**
2. **Question & Analyse Assumptions;**
3. **Don't Assume Creative Ideas Sell Themselves;**
4. **Encourage Idea Generation;**
5. **Knowledge is a Double-Edged Sword;**
6. **Encourage Children to Identify and Surmount Obstacles;**

Sternberg's 12 Keys to Developing the Habit

7. Encourage Sensible Risk-Taking;
8. Encourage Tolerance of Ambiguity;
9. Help Children Build Self-Efficacy;
10. Help Children to Find What They Love to Do;
11. Teach Children the Importance of Delaying Gratification;
12. Provide an Environment that Fosters Creativity.

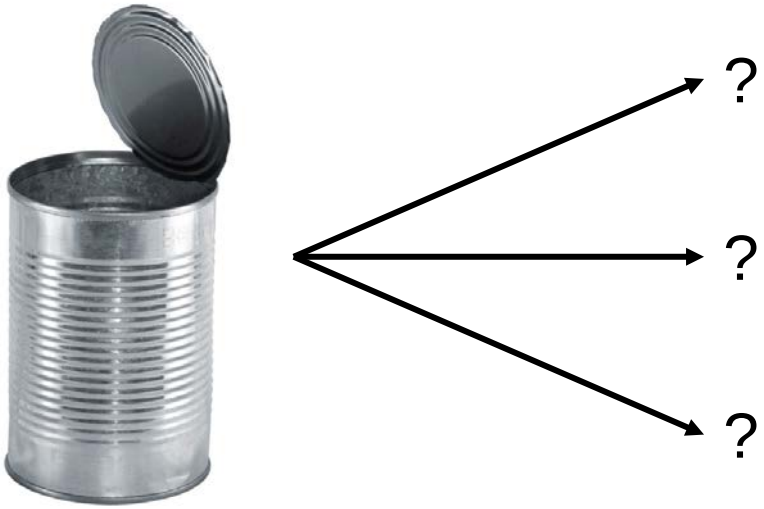
From *What* to *How*?

- **We know that there are still hurdles for creativity in education.**
- **E.g. most teachers don't know how to assess it.**
- **We also know that a weakness of some creativity training is *poor generalisability* – it doesn't translate from the training to the classroom (e.g. Wallach, 1985*).**

*Wallach, M. A. 1985. Creativity testing and giftedness. *In:* Horowitz, F. D. & O'Brien, M. (eds.) *The Gifted and Talented: Developmental Perspectives.* Washington, DC: American Psychological Association.

From *What* to *How*?

- **E.g. *Divergent Thinking*.**
- **Central to creativity and creative problem solving, but we teach it in an *abstract* and *unrealistic* manner.**



Form-first Divergent Thinking?

- **It's true that this is divergent thinking, but is it how we think divergently in the real world?**
- **When we solve real problems?**
- **Or do we use Divergent Thinking somewhat differently in everyday applications and situations?**

Function-first Divergent Thinking

- **How do we solve real problems?**
- **We generally don't start with the solution (e.g. a brick) and ask "what problem can I solve with this brick today?"**
- **Rather, we identify a problem (e.g. How can I build a house?), and then we look for solutions to that problem.**
- **When the circumstances (constraints, competition, change) dictate, we need solutions that are not just effective, but also novel – i.e. creative.**

Tailoring Theory to Practice

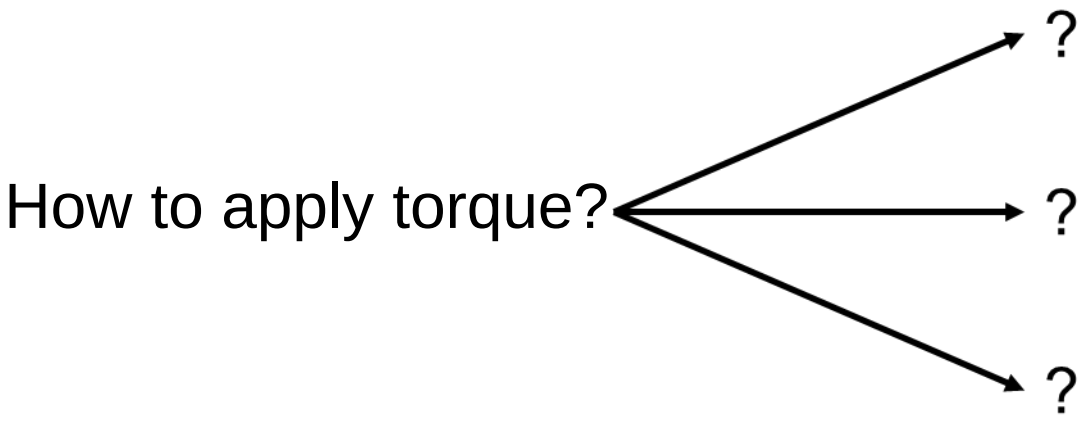
- **The *Divergent Thinking* example illustrates that theory (what?) needs to be connected better to implementation (how?).**
- ***Perfect* Practice Makes Perfect**
- **The *Screwdriver* illustrates how we can translate theory into effective practice.**
- **What can we do with this object?**

Now Function-First!

- **What is the function of a screwdriver?**
  - To screw in screws?
  - To ??????????????
- **Try expressing the function in the following form:**
  - How to “verb” “noun”?
  - E.g. How to screw (verb) screws (noun).
- **Even better, make the verb and noun as “solution free” or abstract as possible:**
  - E.g. How to apply torque?

Function-first DT

- **How to apply torque?**
- **Now give me 10 other ways you can apply torque to a screw.**
    - Turn it with your fingers.
    - Use a ???



From Theory (What?) to Practice (How?)

- **<u>What:</u> Give children the opportunity to define the problem (1):**
- **<u>How:</u>** ***"Write problem statements that invite interpretation and judgment. State the problem in functional terms (<u>what</u> has to be done, not <u>how</u> it should be done) and "how well" is not specified (i.e. no mention is made of "in less than five minutes" or similar)."***
- ***"The success criteria should be open-ended and stated in general terms only."****
- **<u>Why:</u> Allowing children the opportunity to define the problem develops their ability to exercise judgment, take risks, deal with ambiguity.**

*Cropley, D. H. (2014), Fighting the Slump: A Multifaceted Exercise for Fostering Creativity in Children, *International Journal of Creativity and Problem Solving*, October.

Redefine Problems - Example

- **Moving from highly convergent problems:**
  - What is a screwdriver used for?
- **But not simply replacing them with form-first divergent problems:**
  - List ten things you can use a screwdriver for?
- **Instead, giving realistic, function-first divergent problems that invite interpretation and judgement:**
  - Your car breaks down in the countryside, and you have no tool kit. You can repair the car, but to do so, you need to unscrew a part, clean it, and replace it. Describe how you would carry out the repair, despite not having a tool kit.

Redefine Problems - Example

- Notice that many possible details of the problem are not made explicit.
- How long do you have? How big is the part?
- Is the part easy to access? How big are the screws?
- Can I break the part if necessary? What resources do you have?
- What objects might be available around the car?
- Etc.

Encourage Idea Generation (4)

- **In addition to the question of *what kind of idea generation we teach* (form-first, function-first), there are <u>two</u> related "how" issues that are important:**
  - First, real-world idea generation is rarely a *one-shot* activity;
  - Idea generation is usually embedded in a process that consists of a cycle of generation – evaluation – generation – evaluation.
  - In other words, idea generation (divergent thinking) is accompanied by stages of idea evaluation (convergent thinking).

Encourage Idea Generation (4)

- This cyclical characteristic means that idea generation is embedded in a process, and that **process** should be part of what is taught.
- Second, the convergent, evaluative part means that we also need to address a critical question,
- **How do we assess solutions for their creativity?**

Encouragement (Recognition)

- **Step outside of the 12 habits for a moment.**
- **If we, as teachers, can't recognise creativity when we see it, in what the students do, then we will have difficulty teaching it.**
- **Much of what we do in classroom creativity is about generating an output – a product.**
- **We can be explicit about each of the 12 habits – both what it is, and how to do it – but if we can't recognise creativity in the end result – the product – then our efforts may still be in vain.**

The Creativity of *Things*

- **What we need is a Rubric. In other words – a *Measurement Scale*.**
- **Furthermore, we need a scale that:**
  - Teachers can use without special knowledge/training;
  - Has sufficient detail to provide the basis for *formative feedback* to students;
  - Uses terminology that reflects theoretical models of product creativity, but is understandable to non-experts (students).

Product Creativity

- **Relevance & Effectiveness:**
  - Does the solution do what it is required to do?
- **Novelty:**
  - Is the solution new, original, surprising?
- **Elegance:**
  - Is the solution complete, well-made, clear?
- **Genesis:**
  - Does the solution shift paradigms, change perspectives, offer new insights?

Using a Product Rubric

- **Example: *"Make me a paper plane, and make it creative. Use no more than 1 sheet of A4, and I want it to fly across the room."***
- **I'll give you some examples to rate…**
- **We'll then compare our ratings, and how we might give feedback.**

R&E – Novelty – Elegance – Genesis

Paper Planes

Design	R&E	Novelty	Eleg	Gen	Overall
The Dart	4.7	1.5	4	1	2.8 (4)
The Flat Sheet	2.7	3.6	3.2	3.2	3.2 (3)
The Bad Dart	3	2.8	1	1.7	2.1 (5)
The Defier	4.7	3.6	**5**	3.8	4.3 (2)
The Ball	**5**	**5**	4.4	**4.3**	4.7 (1)

Sternberg's 12 Habits – How*

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Questions?

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