Wider theories 2: TRIZ
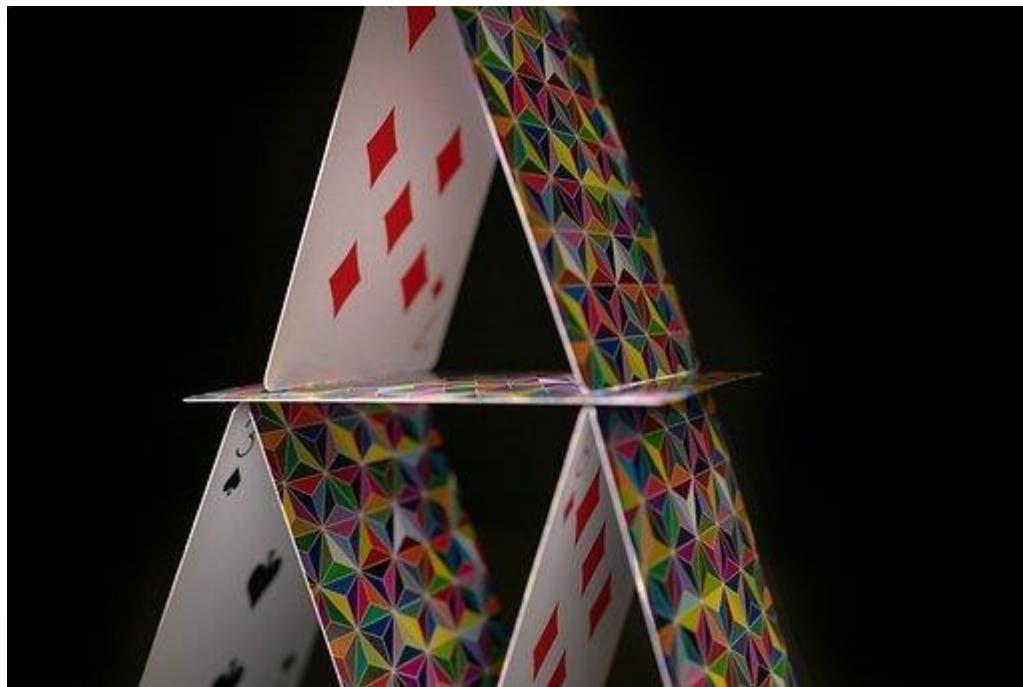

TRIZ is an exciting creative thinking tool with a detailed philosophy and set of resources surrounding it. This blog post is a *very* general introduction to the overall contours of the idea and how it can help in classroom teaching. There will, we hope, be more to say about it in future blog posts.

In short, TRIZ involves finding a way to identify the *type* of problem you are solving, looking for similar examples of that problem-type being solved, and then seeing whether the existing problem-solving can help with your own. For background: TRIZ was invented by a Russian patent attorney (Genrich Altshuller) who realised that very few 'inventions' were genuinely new and original, but were actually variations on existing ideas applied in different arenas. Altshuller's methods are now very often used by companies and design-thinkers who realise they can save a huge amount of time simply by looking for analogous projects to their own.

Altshuller developed 40 principles that, he argued, apply to all examples of innovation in design thinking. They included things like the weight, length and temperature of an object.

Here is an example of applying this generalised definition of TRIZ to the **cold weather bicycle:**

What problem am I solving?	Designing a cold weather bicycle
What general principles am I looking to change?	1. *Temperature of the bicycle itself* 2. *Shape / materials of bicycle to protect people from cold weather*
1. Existing examples of objects being used to increase *temperature*	• *Gloves with heat pads;* • *Heated car seats;*

	• *Car heaters;*
2. Existing examples of the *shape* / *material* of an object keeping someone / something warm	• Motorbike visors • Smaller rooms get warm more quickly • Tea cosy • Insulating material keeps warm things warm

The next step in the process with a student would be to ask them which of these ideas could be adapted or directly applied to the cold weather bicycle.

Like our post above about morphological analysis, our next question is how this technique, which has historically been applied within the design of objects, can be applied to ideas, concepts and theories.

What problem am I solving?	***Using utility theory to judge whether the decisions made in the 2009 financial crisis were ethical.***
What general principles am I looking to change?	*Does not yet apply*
Existing examples of objects being used to increase temperature	*Does not yet apply*
Existing examples of the shape / material of an object keeping someone / something warm	*Does not yet apply*

The issue here is that we are not trying to *change* anything; we are trying to apply one idea to another. But by tweaking the wording, as we did for morphological analysis above, the method still works:

What problem am I solving?	***Using utility theory to judge whether the decisions made in the 2009 financial crisis were ethical.***
What general task am I trying to perform?	1. *Apply a philosophical theory to something that happened* 2. *Apply a theory to a historical event*

1. Existing examples of *applying a philosophical theory to something that happened*	*I have found an essay applying utilitarianism to the Iraq War.*
2. Existing examples of *applying a theory to a historical event*	*I have discovered that people apply theories about gender and society to historical events.*

Looking at this, it seems clear that, when trying to solve problems relating to ideas rather than objects, the TRIZ method provides a framework for finding a category of information that falls under the banner of what we normally call *tertiary sources*. Here is a final example:

What problem am I solving?	**Using theories of what makes something 'fair' to design a behaviour policy for a school.**
What general task am I trying to perform?	1. *Apply a theory of something to a school* 2. *Apply the theory of 'fairness' to something*
1. Existing examples of applying a theory to a school	*I have found that there are schools based on the 'Montessori theory'*
2. Existing examples of applying a theory of 'fairness' to something	*I have found out that people apply theories of social justice to society*

As we did for morphological analysis, it seems that we need to broaden the language when designing a TRIZ-inspired grid like this for students to fill in. The following offers one way in which to do this:

What problem am I solving?	
What are the general principles I am trying to change or use?	1. 2.
Existing examples of 1	
Existing examples of 2	

The challenge with this system is that developing 1 and 2, and then coming up with examples of them, is actually very difficult. In the world of engineering, TRIZ makes use various lists and principles that help with this; for example, if you realise that you are solving a problem relating to reducing the amount of space being taken up, TRIZ provides standard trends and solutions to help.

It remains to be seen whether it would be possible to make the modified TRIZ table above significantly more impactful by developing equivalent lists that were about problems beyond the realms of design thinking. This is a hugely exciting area of future possible development...