

## Wider Theories 1: Morphological Analysis



We developed our certificate based on our experiences of encouraging students to be creative in the classroom. The journey of beginning to refine our teaching methods was similarly based on classroom experience. Our simple research method was the question: What works with Year 10 and what doesn't?

Only once we were up and running with the certificate did we start to look into some of the other fields in which people are seeking to teach creative thinking in innovative ways. Over the next few blog posts we will reflect on the existing methods we found, their relevance to our own certificate, and also some of the challenges moving forward in the context of teaching creative thinking in the secondary classroom.

### **Idea 1: Morphological Analysis**

A simple way to summarise this approach is to say that you break down a problem into small parts, look at solutions to those parts individually, and then work collaboratively to see which combination of smaller solutions might provide a good overall approach.

This idea has been hugely helpful when teaching Year 10, and relates quite closely to the 'problematize your problem' advice given above in the post on 'How do you teach creative thinking in response to problems?' We had already found through teaching 'problematize your problem' that, if a student is designing a bicycle that will keep the rider warm in cold weather, it helps to focus on the specific parts of the bicycle and look into precise solutions.

Morphological analysis places an emphasis on looking at various parts of a problem simultaneously, creating a grid with solutions on it, and then finding an overall set of solutions to it. Here is an example of that kind of grid in the case of our bicycle example:

**How can we design a bicycle that keeps people warm in cold conditions?**

Sub-Problem	Solution 1	Solution 2	Solution 3	Solution 4
Cold hands	Heated handles	Protective covering / visor	Gloves heated by pedalling	Vibrating handles to keep hands moving
Cold head	Large visor covering bike	Helmet heated powered by pedalling	Change posture of cyclist so head is not exposed?	Heater with heat somehow contained and directed towards head
Cold feet	Heated pedals	When connected to pedals, shoes become heated	Covering for feet to prevent any windchill	Vibrator to keep feet moving and blood pumping

The advantage of this method for our Year 10s is that it takes the pressure off the quality of the solution and puts the emphasis on generating multiple ideas, which can each be assessed only once the initial, process of brainstorming ideas has taken place.

Another powerful result of approaching creative thinking in this way is that students can then simply choose a combination of solutions. The basis for that decision-making will itself be analytical, and can feel freer than immediately assessing the details of how feasible a solution is. Another way of putting this is to say that it is *fun* to generate lots of ideas and then combining them is.

**How can we adapt this model to suit different kinds of question?**

The question we have as school educators running a course where students can choose their own topics is whether and how morphological analysis can be applied broadly across different question types. Clearly it works well (as above) when trying to alter various components of a physical design, but does it work for, say, a project on geography or philosophy?

A good way to answer that question is to try a morphological analysis chart in relation to different types of question. Here are two examples, with thoughts on how morphological analysis translates to these different question-types:

- 1. I will be using utility theory to judge whether the key decisions made during the 2008 financial crash were ethical.**

Sub-Problem	Solution 1	Solution 2	Solution 3	Solution 4
Which aspect of utility theory shall I use?	<i>Long-lasting</i> happiness	<i>Intensity</i> of happiness.	<i>Fecundity</i> of happiness.	<i>Volume</i> of happiness
Which key decisions?	Decisions by individuals to commit fraud	Decision not to regulate lending	Incorrect forecasting	Decision to give credit too easily

In this example, the more traditional morphological analysis of the bicycle example above has shifted in two ways:

- Firstly, the ‘problems’ are no longer things that might be improved; they are choices that the student has to make about how to narrow down their focus question.
- Secondly, and subsequently, the ‘solutions’ are not solutions to the overall problem question; they are suggestions about which way of narrowing down the research question.

How, therefore, can we modify the morphological analysis chart to suit questions that are not design-based? Changing ‘Problem’ to ‘Sub-question’ and ‘Solution’ to ‘Suggestion’ seems a clear route to take.

## 2. I will be using theories of what makes something ‘fair’ to design a behaviour policy for a school.

Sub-Question	Suggestion 1	Suggestion 2	Suggestion 3	Suggestion 4
How will we define ‘fair’?	‘Treating people equally’ (dictionary)	‘To attribute to each his or her due’ (Angie Hobbs)	‘without cheating to get an advantage’ (dictionary)	‘free from dishonesty’ (dictionary)
What will we include in our behaviour policy?	Student behaviour relating to how to relate to teachers	Teacher behaviour?	Student behaviour relating to uniform	Student behaviour towards each other
What kind of school will we focus on?	A normal secondary school	An innovative secondary with very different expectations from normal	A normal primary school	An innovative primary

The re-naming of the categories was helpful in this example. Like the bike example, the benefit of this kind of analysis (it may not really be strictly 'morphological' anymore) is that students identify sub-categories within the problem they are exploring, and also that they generate several ways of defining those sub categories. Having (in this case) twelve different options to choose from seems like a good thing for a student to have as they set out on a project.

The question that comes up from this is:

- Is there a single name by which both traditional morphological analysis and this new version can be labelled?

One solution to the problem is to design the chart like this, which applies to each of the problem types we have encountered so far. 'Sub-category' can refer either to the part of a physical design or to 'part' of a research question, such as a word that needs defining.

Sub-Category	Idea 1	Idea 2	Idea 3	Idea 4

Looking back, this seems to be one good method for making the teaching 'problematizing your problem' slightly more structured.