Credne 2.2 Fostering Creativity: Divergent Thinking

Divergent thinking is a key element of creativity – and fortunately one that is easy to get your head around, and that can often be fostered in simple, practical ways.

What is it?

The short version: Coming up with multiple possible ideas or solutions, instead of heading straight for a single "correct" answer.

The term "divergent thinking" was coined in the 1950s by the American psychologist J.P. Guildford – but to be clear, as used in contemporary creativity studies it has travelled some way from Guildford's original conception (Baer, 2017). Obviously, Guildford didn't *invent* divergent thinking; he just theorised and named something that was there all along. There is sound neuropsychological evidence of its existence as an actual thing, going on inside our brains (Vartanian, 2011). And divergent thinking is a major focus in attempts to test and quantify creativity – but don't let that put you off if you're inclined to resist that sort of thing.

The word **ideation** (basically, coming up with ideas) is sometimes used as a synonym for divergent thinking – though you could argue that more correctly ideation is a specific subset rather than the exact same thing. You'll also hear the term "non-routine thinking", and you might sometimes find divergent thinking conflated with the much bigger and blurrier idea of "creative thinking" itself. To be clear: divergent thinking is *not* directly synonymous with creativity, and nor is it synonymous with **originality**. Divergent thinking is a *part* of creativity, and originality is – hopefully! – a quality of the products of divergent thinking.

So what actually is divergent thinking? The easiest way to explain is to set it alongside its counterpart: **convergent thinking**.

Put simply, convergent thinking is the process of moving towards a single correct answer with no possible alternatives; and divergent thinking is that of moving from a single starting point towards multiple possible solutions.

Here's a really simple example: if you ask students, **"What's 2 + 4?"** it demands convergent thinking. There may be several *ways* to solve the problem, but in the end there is only one possible answer. If they say anything other than "6" they will have answered incorrectly. But if you ask students, **"How can you make 6?"** and they say "2 + 4", you can respond like this: "Correct. Now give me another answer!" Even if you just stick with straightforward mathematical solutions, there are infinite – *literally, infinite!* – correct answers. The way the problem has been formulated prompts divergent thinking.

Here's **Tina Seelig** explaining with a very similar example – and with a further example more apt to higher education.

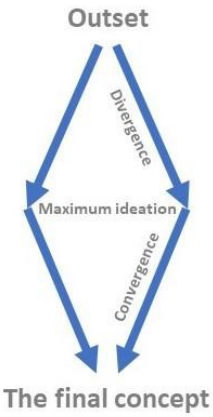
Try it for yourself: think of a standard task or question from your own field that could be flipped or reframed to demand a more divergent response from students.

The role of divergent thinking in creativity

Divergent thinking is most obvious as a discrete element in **problem-solving formulas** or Design Thinking, with **brainstorming** being a particularly well-known technique for ideation or divergent thinking. But it is involved in some way in virtually all creative outcomes. A poet who has conveyed the essence of something in an original way has diverged from the single track leading towards standard literary metaphors and poetic forms. **But don't make the mistake of assuming "divergent thinking good, convergent thinking bad".** Convergent thinking of some kind is essential to achieving a successful creative outcome; it just needs to happen in the right place and at the right time. You could look at it like this:

- **Divergent thinking = coming up with ideas**
- **Convergent thinking = evaluating them and making decisions ahead of realisation**

The image on the right gives a sense of this. However, it's worth noting that the standard formula for Design Thinking actually places the main divergent thinking stage *after* a bout of convergence ("defining the problem"). There are different ways to organise the process, but the divergent and convergent stages do need to be discrete to be effective, whatever the order.



Here's an explanation from Anne Manning of Harvard – with a great bit of visualisation – of how divergent and convergent thinking fit into the creativity process more generally, and why they don't really work when muddled together.

It's also important to recognise that **divergent thinking itself isn't a uniform thing**. Scholars often break it down into four aspects (and may attempt to test and quantify those aspects). The first and most obvious is **fluency** – simply coming up with as many different ideas as possible. This makes for a good start to the process, but what if the ideas aren't very good? The most productive divergent thinking requires further aspects: **originality** (coming up with genuinely novel ideas) and **flexibility** (coming up with genuinely diverse ideas, rather than just variations of the same thing). Finally there's **elaboration** – the ability to flesh out an idea with the proper detail (you could argue that this comes at the point where divergence shades into convergence).

When you're trying to foster divergent thinking, it's useful to keep in mind exactly which of these four aspects you're really trying to boost.

Fostering divergent thinking

In higher education we're already more likely to present students with questions or tasks that require an element of divergent thinking. And in many areas, tasks or questions **may not divide as neatly into convergent and divergent categories** as "What's 2 +4?" and "How can you make 6?"

So in practice, it's often a case of trying to get students to think *more* divergently than they would do without an intervention – to go beyond basic **fluency** to **originality** and **flexibility**.

You might tell a group of business students to come up with an idea for a new takeaway food concept; or you might ask a group of engineering students to design a new bridge. They will have to come up with *some* new ideas, and may do so quite fluently; but those ideas may not diverge from the conventional as much as you'd hope. The students might not be **"thinking outside the box"**.

This is where the myriad techniques to boost divergent thinking come in. They often involve **injecting some kind of disruption or introducing new parameters** into standard brainstorming approaches (which themselves work well enough to encourage basic fluency of divergent thinking).

- Many of our Speedy Techniques (available on the Credne website) are designed to boost divergent thinking.
- SCAMPER is another approach which can be applied to an existing concept (a bridge; a takeaway food outlet).
- Perhaps counterintuitively, **introducing constraints** can boost divergent thinking - and thus creativity: that takeaway food outlet? It has to be mobile, and it has to function without a mains electricity connection…
- And **forcing combinations** is another effective technique. That bridge? It needs to double as a takeaway food outlet…

A general approach that works well is to **make multiple interventions throughout the idea-generation process**. Students might start with a standard brainstorm – "ideas for a new takeaway food outlet", for example. As they work, you periodically introduce a new disruption, constraint, demand for combination, or a simple "what if…?" All of this should help push their thinking to diverge further from conventional tracks.

But my students don't design stuff…

If you teach in an area where students aren't routinely asked to design things in the most literal sense – bridges, businesses etc. – you might think that this has nothing to do with you. But that's not the case. Divergent thinking still has a role to play when students aren't directly creating or designing something; **it's involved in analysis too**.

Try this: here's a question requiring convergent thinking (there's only one correct answer): ***Who was elected President of the United States of America in 2016?*** How could you frame that in a way likely to prompt more divergence?

If the question above is reframed as "What factors contributed to the election of Donald Trump in 2016?", there are many possible answers: socio-economic factors; unresolved tensions in the Republican Party; influence of partisan broadcast news organisations; the rise of social media; the electoral college system – and many more besides.

In all likelihood, students (and lecturers!) will **converge on those things most directly related to their own interests**. Journalism students might privilege the media factors. Politics students might focus on the Republican Party's internal wrangles. And constitutional historians and mathematicians might go for the electoral college system. They won't necessarily *ignore* the other factors, and they will surely identify *some* of them – but probably not all of them.

So, if you want to encourage the most wide-ranging response to such a question, actively trying to foster divergent thinking in the process is a very good idea.

Divergent thinking is part of the process that leads to fresh scholarly arguments, interpretations and analyses – and to original artistic or aesthetic work – as much as to innovative bridges or takeaway food concepts.

"Lesson unplanning"

So how to build this into everyday teaching and learning, beyond specific idea-generating exercises? Ronald A. Beghetto has a great concept, which he calls **"lesson unplanning"**, and which can serve as a helpful maxim for any teaching context. Beghetto's idea rests on the distinction between **"routine tasks"** – that is, those typically requiring a convergent thinking response – **and "non-routine tasks"** – those to be completed via at least some degree of divergent thinking. Crucially, Beghetto acknowledges that teachers are bound by curricula and schemes of work, and thus may struggle to find leeway – and indeed time and energy – to design for non-routine approaches from scratch. His brilliantly simple solution is as follows:

> Rather than teachers trying to *add* non-routine problems to their curriculum, a more feasible approach is for teachers to learn how to use "lesson unplanning" [...] to *transform* routine problems into non-routine ones. (Beghetto, 2017, p.987)

The simplest example to illustrate what he means by this is the one we shared earlier – flipping "What's 2 + 4?" to become "How do you make 6?" The task was already there, lined up; it was just a case of presenting it in a different way.

In more complex learning scenarios, Beghetto's lesson unplanning concept is "the process of creating openings in routine exercises by replacing predetermined features with to-be-determined aspects". The features for replacement can be big or small; "remove predetermined features of a routine task", Beghetto says, "to add uncertainty and thereby transform it into a non-routine problem."

Even when a task really *has* to be routine/convergent thinking-based, it may still be possible to crack open a space for ambiguity in the way students **deliver their response**. For example, students might have to research and report on a particular law – that is, to correctly identify unambiguous details. But you could ask them to report back using an unconventional mode – anything but a standard written report (a poster? an animation? a song?)

It certainly wouldn't be appropriate to do this all the time. **But whenever you do allow space for this sort of thing, you're fostering divergent thinking, and the more you foster divergent thinking the more you're fostering the potential for creativity itself.**