Chapter 8

Clever people are not always creative

Many of us associate creativity with intelligence. In other words, a clever person is able to solve problems in a creative way, whereas a stupid person is not able to do so. However, the relationship between creativity and intelligence is not as straightforward as you may think.

Intelligent people (as measured by IQ or educational qualification) can be as helpless as ordinary people when it comes to creative problem-solving, as the following anecdote indicates.

In a certain university, there was a departmental colloquium at which a candidate for a faculty position was presenting his research. As he started his presentation, he realized that his first slide was projected too low on the screen.

There was some murmuring by the audience, and then someone asked: "Is there a book or something to put below the projector?" Immediately a book was volunteered, but it was rather thick, and the slide was now projected too high on the screen.

A flurry of activity ensued, as several books were forwarded as a possible replacement. After several more rounds of this exchange, a professor finally exclaimed, "Well, for Pete's sake, I don't believe this!"

The professor marched over to the projector, grabbed a thick book, opened it halfway, and then put it under the projector. He looked around at his colleagues and shook his head, saying, "I can't believe it. A room full of PhDs, and no one knows how to *open* a book!"

From this true story of the projector and professors, we can make the following deduction: even if one has a high level of intelligence, it does not mean that one will be able to solve problems in a creative way. In fact, many psychologists have pointed out that intelligence acts as a double-edged sword, as far as creativity is concerned.

On the one hand, to make an innovative contribution to a certain field of knowledge, one must begin by assimilating the available information in the given domain. Obviously a high level of intelligence enables one to perform this task efficiently.

Source
Ng, A. K. (2007). *Creative Problem-Solving for Asians: A Practical Guide to Develop Your Creativity as an Asian.* Singapore: The Idea Resort. (Chapter 8, abridged)

On the other hand, *too much* knowledge can impede the creativity of the person by causing him to be entrenched in a certain position. The person becomes so used to looking at things in one way that he has trouble seeing them, or even imagining them, in another way.

Intelligent but absent-minded professors who forget how to open a book are not the only ones who get stuck in a mental rut. All of us have experienced this failure of the imagination before, as we are accustomed to perceiving things in a familiar way.

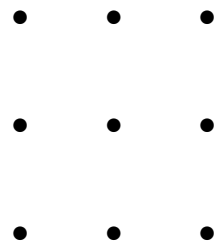
Our tendency to react in a set manner prevents us from overcoming the *perceptual obstacles* to creative problem-solving. Psychologists have identified different types of perceptual obstacles, but they indicate one thing: our mind is the greatest enemy when it comes to creative problem-solving.

Perceptual obstacle 1: Restricting the original problem-space

Figure 8.1a The nine dots puzzle

Task : Join up the nine dots with four straight lines.

Condition : You can't lift up the pen from the paper while drawing the lines.



One form of perceptual obstacle is known as *restricting the original problem-space*. To illustrate its nature, try to solve the puzzle shown in Figure 8.1a. You are given nine dots arranged in the form of a square.

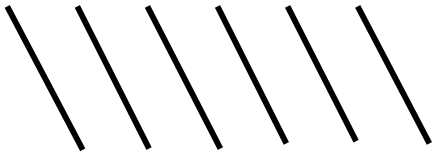
Your task is to join all the dots together by drawing four straights lines across each of them. But there is one condition to observe: you can't lift up the pen from the paper when drawing the four lines across the nine dots. Try it out now.

Now try another puzzle shown in Figure 8.1b below. You are given six wooden sticks. You have to form four equilateral triangles with these sticks. But there is one condition: you can't cross the six sticks with one another when forming these four equilateral triangles. Try it out now.

Figure 8.1b The six sticks puzzle

Task : Form four equilateral triangles with six sticks.

Condition : You can't cross the match-sticks with one another.



Many people have problems solving the two puzzles because they encounter a perceptual obstacle to creativity. It is known as *imposing restriction on the original problem space*.

In the nine-dots puzzle, we tend to draw the lines *inside* the boundary of the square, rather than *outside* of it. In the six-sticks puzzle, we tend to regard the solution as two dimensional, rather than three dimensional.

In each case, our mind has imposed a restriction on the original problem space, and that's why we can't solve the puzzle.

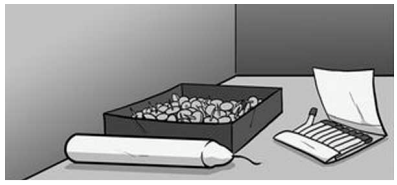
Perceptual obstacle 2: Experiencing functional fixedness

Another type of perceptual obstacle is known as *functional fixedness*. Again, to understand its nature, try solving the puzzle shown in Figure 8.2a. You are given a box of thumbtacks and a candle. You have to attach the candle vertically to the side of a door, without lighting up the candle. Try it out now.

Figure 8.2a The candle puzzle

Task : You are given a box of thumbtacks and a candle. How do you attach the candle vertically to the side of a door?

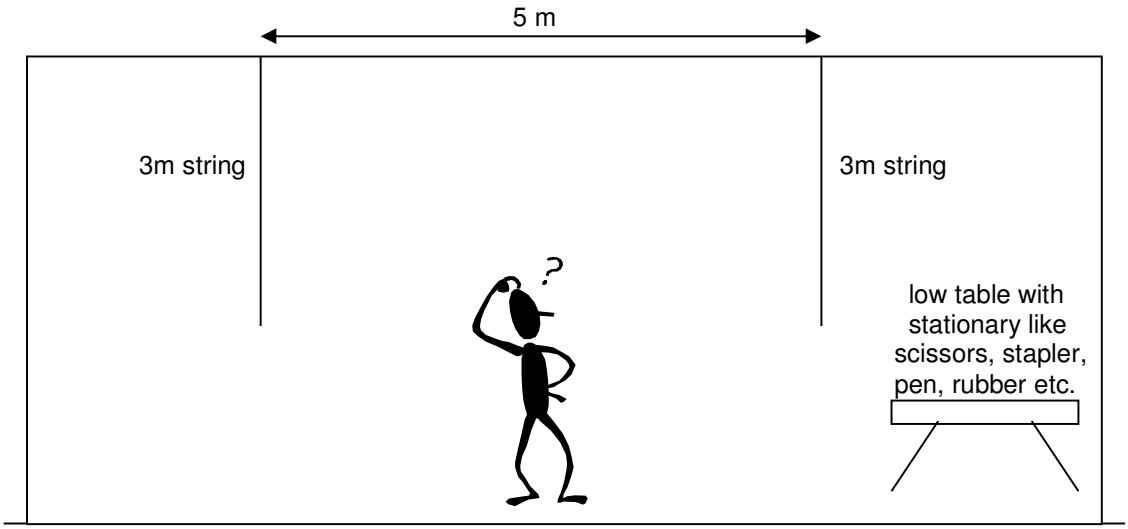
Condition : You cannot light the candle.



Now try another puzzle shown in Figure 8.2b below. There is a room with two strings hanging from a ceiling. The strings are three meters in length, and five meters apart. You have to tie these two strings together, without pulling them down from the ceiling. Try it out now.

Figure 8.2b: Two-strings puzzle

There is a study with two strings hanging from a ceiling. The strings are 3 meters in length, and five meters apart. How do you tie the two strings together?



If you are not able to solve these two puzzles, it is because you have experienced *functional fixedness*. This is another perceptual obstacle to creativity, in which you adopt a rigid view of everyday objects.

For the candle problem, you fail to see an alternative use for the box containing thumbtacks. For the two-strings problem, you fail to see an alternative use for the stationary lying on the table. In each case, functional fixedness has prevented you from solving the puzzle.

Perceptual obstacle 3: Solving the perceived vs real problem

A third type of perceptual obstacle is known as solving the *perceived* problem instead of solving the *real* problem. To understand the distinction between perceived and real problem, try solving the following two puzzles.

The first puzzle involves two men hiking in the forest. Along the way, they met a huge hungry bear. The first man moaned, "We're going to get eaten!" The second man gets ready to run. Why is the second hiker more optimistic than the first one, when both are in danger of being eaten by the bear?

The second puzzle involves a group of guests staying at a five-star hotel. They complained that the lifts were moving too slowly. The hotel hired a consultant to solve this problem of the slow-moving lift. He came up with a cheap yet effective solution to the problem, which surprised the hotel by its simplicity. Can you guess what this solution is?

When I pose these two puzzles to people, invariably I get a lot of answers. For the hikers-and-bear puzzle, I was told that the second man can run faster than the first man.

For the slow-moving lift puzzle, I was told that the consultant modified the mechanism in the lift to make it move faster. These suggestions failed to take into account the distinction between perceived problem and real problem.

In the case of the hikers-and-bear puzzle, we perceive the problem to be about outrunning the bear, whereas the real problem is about outrunning the other man. In the case of the slow-moving lift puzzle, we perceive the problem to be mechanical: how to make the lift go faster; whereas the real problem is psychological: how to catch the attention of bored guests who are waiting for the lift.

If we do not make this distinction between the perceived and real problem, we are not able to crack the puzzles. But as soon as we make this distinction, we can think of elegant solutions.

How a school boy impressed scientists with an innovative solution

We have looked at various types of perceptual obstacles to creativity. If we can overcome them, we will be able to develop innovative solutions to a problem. Consider this true story that I read in the newspapers.

It is about Miro Keil, an 11-year old school boy from France. Miro did something which is considered to be very remarkable for a student of his age. He came up with a creative solution to deal with a serious environmental problem that impressed even the experts.

An oil-tanker known as Erika had collided with another ship in the Baltic Sea during a fierce thunderstorm. This collision left a gaping hole on the starboard side of the vessel. Over 1000 tons of oil that Erika was carrying also spilled into the ocean. The oil slick posed as a grave danger to the wild life in the surrounding areas.

Miro learnt about this disaster on television. “I saw the Erika oil tanker on TV and all the horrible pictures with the animals and everything.” He decided to try to find a solution to the problem. After reflecting on the matter for some time, he came up with a few interesting ideas.

First, floating barriers should be put around the oil slick to prevent it from spreading outwards. Second, a gigantic fishing net can be dropped into the sea. Third, liquid nitrogen should be used to freeze the oil slick. Finally, the frozen oil trapped in the net can be lifted away from the ocean.

Miro spent a few weeks checking his textbooks and talking to his chemistry teacher. He experimented with his creative ideas at home, using oil and water in a basin. Eventually, he submitted these ideas to a school science competition.

Miro's solution for dealing with the oil slick won the first prize for its creativity. The judges were so impressed with his creative solution that they told his parents to patent it.

Scientists at the Juelich Research Center, where the contest was held, hailed it as a breakthrough. They invited Miro to work with them on his ideas during the school holidays.

Miro is just an ordinary 11-year-old boy who goes to school like every other student. However, he is able to come up with a creative solution that impressed even the experts. This is because he has overcome the perceptual obstacles to creativity.

First, Miro suggested freezing the oil by the use of liquid nitrogen. From this creative idea, we can see that he did not impose restrictions on the original problem space, but expanded it instead.

Second, Miro suggested using a fishing net to cart away the frozen oil from the sea. This showed that Miro did not experience functional fixedness. Instead, he was able to think of an alternative use for the fishing net.

Third, Miro did not perceive the oil-spill problem in the usual way: how to separate liquid oil from liquid water. Instead, he found a different problem to deal with: how to separate solid oil from liquid water. Miro was able to make a distinction between perceived and real problems.

Finally, Miro did not rely on a past solution to deal with the oil-spill problem. Instead, he thought of a novel solution that was hailed as a breakthrough by experts. Miro demonstrated the ability to break mental sets.

Tips on dealing with perceptual obstacles to creativity

Tip1

Our mind is the greatest enemy when it comes to creative problem-solving, so don't be fooled by our intelligence!

Tip 2

Do not restrict the original problem-space. Instead, expand it in various ways.

Tip 3

To overcome functional fixedness, think of alternative uses for everyday objects.

Tip 4

Always identify what the *real* problem is first, before solving it. Otherwise, you may end up solving the *perceived* problem.

Tip 5

Avoid developing a mental set by thinking of alternative way to solve a familiar problem.