



# Creative Problem Solving and Socratic Questioning

By: Michael O'Connell MSc, C Dip AF.

## Creative Problem Solving

### 1. The Importance of Creative Problem Solving

Change is unavoidable. You don't need to seek it; you are surrounded by it and you can't hide from it or ignore it. The increased rate of change in the 21<sup>st</sup> century creates multiple challenges and features:

- **More frequent job changes** – Some predictions forecast that children who are in school today can expect to have more than 11 different jobs between the ages of 18 and 42 and many of these jobs do not exist yet.
- **Shorter and shorter product life-cycles** - products today are replaced more rapidly than ever with life cycles in some technologies lasting no more than nine months.
- **Entertainment production and consumption are more democratic** - Today, digital technology allows low-cost production, and the Internet (e.g., YouTube and Hulu) provides the ability to immediately distribute.

To be effective in work and in life, we must learn to live creatively—to be flexible, adaptable and apply imagination to realise new opportunities and to resolve complex problems. There is much ahead that is new and unknowable and rather than being a victim of change we can prepare for it. For those many situations, there is one common denominator: *human creativity and creative problem solving* ("CPS"). Change originates in creative thought. Creativity is a unique human characteristic that allows us to better *respond* to external changes, such as technological advances and social developments. It also allows us to imagine and then to create the kind of world we will live and work in.

The importance of creativity and creative problem solving is beginning to get serious attention:

- In 2009, the Partnership for 21st Century Skills in the US ("P21") identified the multidimensional abilities now required for students to be successful in school, work, and life. Key skills identified were: critical thinking and problem solving, flexibility and adaptability and initiative and self-direction.
- In 2011, the IBM Global Survey of CEOs identified creativity as the most important requirement in leaders in order to be able to address the challenges they face.

### 2. Myths about Creativity and CPS

Before we provide methodologies for CPS, it may be appropriate to knock on the head some myths that we all carry around about creativity, such as:

- *Myth:* Creativity is the result of innate talent (genius). *Fact:* Creativity is the result of hard work
- *Myth:* Creativity is limited to art. *Fact:* Creativity cuts across all areas of life
- *Myth:* Children are more creative than adults. *Fact:* True creative achievement requires years of life experience

- *Myth:* Creativity is the same thing as originality. *Fact:* Creativity is the intersection of novelty and usefulness
- *Myth:* Creativity cannot be taught. *Fact:* Creativity can be enhanced through teaching and training. We can all be deliberately creative.

### 3. Some tools for Creative Problem Solving

#### 3.1 Divergent and Convergent Thinking

For decades many psychologists consider that with regards to thinking that the mind has two distinct phases—the production phase and the judgment phase—and that each of these phases complement each other during thinking. Proficiency in thinking requires the mastery of both and skill in moving back and forth between them:

- Divergent thinking is *a broad search for many diverse and novel alternatives; the production phase*. When engaged in divergent thinking, our minds stretch to explore and entertain all possible options without evaluating them, willing to be adventurous and to discover new possibilities beyond the familiar and the known.
- Convergent thinking is *a focused and affirmative evaluation of novel alternatives; the judgment phase*. It is an analytical type of thinking, driven by the need to bring order and to make sense. After exploring all possibilities, our mind begins to screen, select, prioritise, organise, and refine what it has found.

In creative thinking, we intentionally separate these two forms of thinking into a “dynamic balance” of first one, then the other. This balance is the core of effective thinking. Four key principles have been proven to be effective at enhancing divergent thinking:

- Defer judgment
- Go for quantity
- Make connections
- Seek novelty

Divergent thinking - the creation of many unevaluated alternatives at each stage—is not an end in itself, but only a means to an end. Ultimately judgment re-enters the scene, facilitating convergence, solution and effective decision-making—the ultimate purpose of the CPS process.

There are four key principles to guide effective convergent thinking:

- Apply affirmative judgment
- Keep novelty alive
- Stay focused
- Check your objectives

A failure to apply both divergent and convergent thinking to solve problems and growth challenges can often lead to missed opportunities, premature action or mistaken assumptions or as evidenced by the following responses to novel ideas:

- *"The concept is interesting and well-formed, but in order to earn better than a 'C', the idea must be feasible."* A Yale University management professor in response to Fred Smith's paper proposing an overnight delivery service. Smith went on to found FedEx. (The Fedex Corporation has annual revenues of \$45bn – Source - <http://investors.fedex.com/phoenix.zhtml?c=73289&p=irol-IRHome>)
- *"This 'telephone' has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us."* Western Union internal memo, 1876
- *"With over 50 foreign cars already on sale here, the Japanese auto industry isn't likely to carve out a big slice of the U.S. market."* Business Week, 2 August 1968. (In 2011 USA

today reported that by 2010 Japanese car manufacturers had 29 plants in the US employing more than 50,000 people).

### 3.2 A Creative Problem Solving Framework

While there are many creative problem solving approaches, a CPS framework which originated in the 1950's in the US is still widely used in education and commercial environments. It is taught in many third level programmes as a proven and legitimate approach to solving problems. The framework shown below comprises a structured and iterative approach.



Divergent and Convergent thinking needs to be applied at each stage of the process and there are numerous tools and techniques that can be applied to make each phase of the process more effective, such as:

- **Clarification Phase:** this phase explores a vision or desired outcome and the exact problem to be solved. It is of fundamental importance as the remaining phases of the CPS process will be ineffective if the challenge is not accurately defined. A key tool in identifying the correct challenge is the “5 W’s and H” – in relation to situation under discussion as why, what, where, when, who and how. Also just by focusing on a series of why questions, you are able to uncover what is behind a situation. The outcome of this phase is a challenge statement: “how can we.....”
- **Ideation Phase:** this phase seeks novel and useful ideas to solve the challenge statement. Examples of tools are brainstorming, forced connections, clustering and refinement of ideas. The outcome of this phase will be an idea or a list of ideas that will address the challenge
- **Development Phase:** this phase turns promising ideas into more workable solutions. Examples of tools are the development of criteria for design and success, use of an evaluation matrix to evaluate strength of ideas and approaches in relation to the success criteria and to make decisions about the most promising ideas to pursue. The outcome of this phase is a more workable solution to enable you to say “what I see myself doing is....”
- **Implementation Phase:** This phase explores environmental acceptance for your proposal and develops a more detailed implementation plan. Some tools for use here are an analysis

of “assisters and resisters”, stakeholder analysis, generating action steps and a performance dashboard. The outcome is a plan for implementing workable solutions and sustaining momentum.

There is a fifth and crucial phase in this process which transcends all the above phases and this is the on-going capability to *Assess the Situation*. This is the “3<sup>rd</sup> eye”. The CPS process is iterative and its management requires the ability to ask and respond to questions such as:

- Where exactly are we now in the process?
- Are all parties involved fully aligned with the process?
- When do we need to go back and review and when can we move forward to the next phase?

Teams and individuals that are trained in the application of this relatively simple and straightforward framework can be both proactive and highly effective in their ability to meet challenges and enhance their career and life skills.

### **3.3 Incubation**

There is much research that provides evidence of the use fullness of incubation. At its very simplest incubation means “to sleep on it”. It provides a break from the active pursuit of a solution to the problem often with the result that ideas develop without your full awareness. Idle or rest periods can prove valuable and we all have the experience that some of our best work related ideas come when we are not at work or even consciously working on a problem/challenge. The subconscious cooperates and even “co-creates” with us in arriving at the solution of a problem.

## **4. Benefits of a Deliberate Approach to CPS**

The knowledge and application of the three tools described above can lead to many advantages:

- As individuals, we can feel greater confidence and empowerment in our ability to meet challenges and solve problems
- Multidisciplinary teams will have a common language for problem solving allowing them to function more autonomously and effectively
- The CPS framework can be used as an organising framework for meetings and decision making therefore ensuring that all participants “on the same page”. Much inefficiency arises when participants at the same meeting are engaging in a “dialogue of the deaf”. One participant may be engaging in divergent thinking and to be shot down by others who are already in convergent or decision-making mode. Similarly, some participants at a meeting may be seeking to clarify a problem while others are already focused on the solution.
- Following the process means that better decisions are made as it provides the structure for ensuring that all alternatives are identified and assessed and all the parties involved in addressing a problem have engaged in a rigorous process to find a workable solution.

## **Socratic Questioning and Creative Problem Solving**

Named after the famous Greek philosopher, Socrates (470-399 B.C.), Socratic Questioning is commonly used in teaching and learning. However, in common with many excellent tools and techniques its use goes well beyond the original intention. In a learning environment the teacher, feigns ignorance of the topic being considered and poses thoughtful questions to learners so they become engaged in the topic. When skillfully used it leads to better long-term retention of knowledge at a deeper level and advanced problem-solving skills. The ultimate goal of Socratic questioning is to increase understanding through enquiry. Sometimes, convictions, when held too tightly, blind us in a way that traps us within our own opinions. In CPS, (discussed earlier in this article) the issue presented as the problem may not be the core problem. Creative questioning can help us to dismantle and discard preexisting ideas and assumptions and brings us to a redefinition or a refinement of the

issue or problem under discussion. Such a critical and enquiring approach enhances excellent thinking skills which are at the very heart CPS and apply at all stages of the process. This approach is particularly relevant for convergent thinking that should lead to good and rigorous decision making. Of particular importance is its relevance at the clarification stage of problem solving which essentially sets the agenda for the remaining stages. Thomas Edison is quoted as saying that if he had a limited period of time to solve a problem, he would spend 95% of that time clarifying the problem – i.e. questioning assumptions, evidence etc. - and use the remaining 5% to solve it.

Some examples of Socratic questioning that can be used for CPS are listed below (there are many examples widely available on the internet):

- **Clarifying questions:**
  - *“When you say xxxxx, what exactly do you mean by that phrase?”*
  - *“When and how did this problem first manifest itself?”*
- **Questions to probe assumptions:**
  - *“How can you be sure that xxxxx is the cause of yyyyyy?”*
  - *“Can you explain why and how the proposed course of action will solve this problem?”*
- **Questions to probe logic and evidence:**
  - *“What evidence is available to support that argument?”*
  - *“When exactly did this happen?”*
  - *“What facts and statistics support the view that.....?”*
- **Questions to probe perspectives:**
  - *“Who do you think will support this initiative and who will resist it?”*
  - *“What, in your opinion, are the motives and interests of the key stakeholders to this problem?”*
  - *“Where are you taking account of the views of the other stakeholders to this issue?”*
- **Questions to probe consequences**
  - *“If we proceed with the proposed solution, what exactly do you see happening?”*
  - *“Are there other possible consequences that you have not thought about?”*
- **Questions about questions**
  - *“Are these questions making sense to you?”*
  - *“Are there questions that you think I should be asking that I’m not?”*

**About the author:** Michael O Connell is as a Human Resources and Change Management consultant and has completed assignments for clients in Ireland, UK, Middle East and Africa. He holds an MSc. in Business Administration and Diplomas in Accounting and Finance, Employment Law and Executive Coaching. He is currently completing an MSc. in Creativity and Innovation at the International Centre for Studies in Creativity at Buffalo State College, USA.