Creative Problem-Solving

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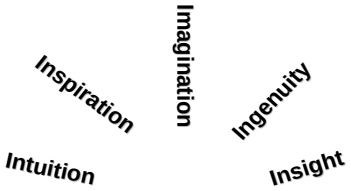
These notes provide attendees with a comprehensive view of the process that was described in the workshop to enable them to tackle a variety of open-ended challenges in a structured way. The aim of the workshop was to experience different ways of accessing personal creativity and imagination and to find new ways of tackling challenges that arise in the workplace or in ones' personal life.

Participants followed a Creative Problem-Solving process first of all to abstract a challenge and re-express it in a form that got to the heart of the matter. This also made it more amenable to a wider range of creative solutions. The under-pinning process used in the workshop was loosely based on the Osborn-Parnes problem-solving methodology. However at the critical stage of Idea-finding in this process a couple of other techniques drawn from different sources were introduced. We began with definitions of terms:

Creativity Vs Innovation

Creativity :

Processes that lead to products, ideas, procedures and discussions that are original and useful.



Innovation :

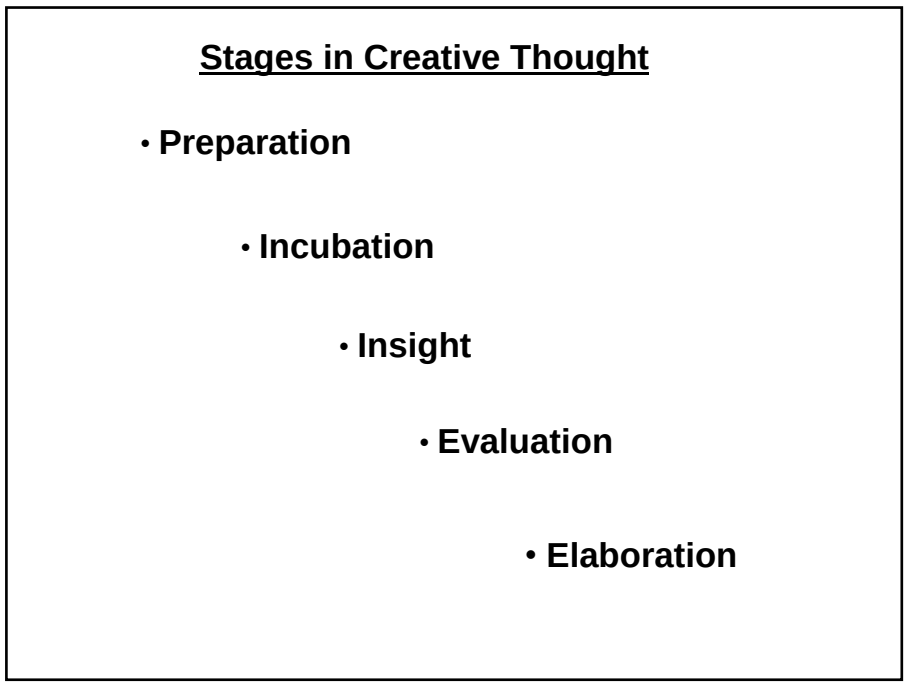
A connected process in which many activities from research through to support are coupled together in an integrated way for a common goal.

What is Creativity ?

A simple definition of creativity in the context of the workplace is given above. Another more general definition is: “Creativity is the thinking associated with Ideas, Imagination, Inspiration, Intuition and Ingenuity.” Creativity can be expressed through virtually any form of human behaviour and everyone has a range of creative abilities. Two of the characteristics that separate highly creative people from the less creative are risk-taking and tenacity.
In this context ‘risk-taking’ describes the impulse to find and try original ideas, to go beyond ones’ familiar boundaries of knowledge and explore new possibilities rather than staying in the relative security of what we already know. The risk is that the ideas will be deemed impractical, inappropriate, crazy etc. In the world of the workplace where not making mistakes is one of the desiderata for career progression this risk can be a significant one. Many ideas will be unworkable but finding the one good one or maybe more accurately the one that’s time is right make’s it all worthwhile both to the individual and the group and changes things in a positive way.
In the workshop we brainstormed the concept of Creativity and then sought to experience the sense of 'Ambiguity' that arises when we go beyond immediate associate thinking by extending the definition of creativity.

What is Innovation ?

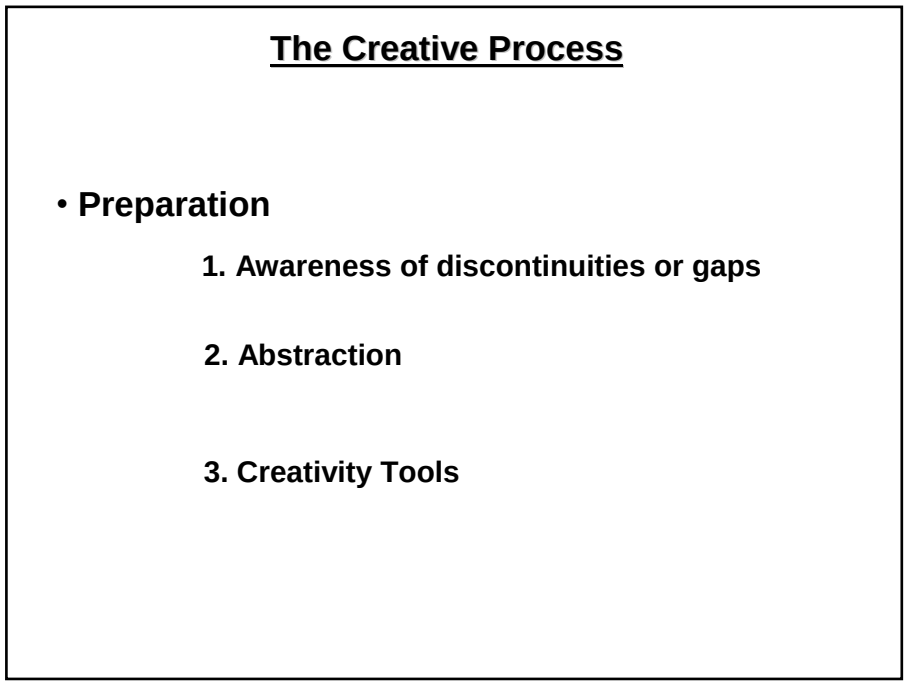
The words creativity and innovation are often used in the same sentence and they are also often randomly inter-changed as if they had the same meaning. There is some overlap in these definitions in that innovation can describe the process of coming up with new ideas but more often innovation refers to what happens after someone has been inspired with a creative idea. A working definition of innovation is given above. Innovation is more concerned with making creative ideas a reality. This begins with communication of the idea and ends with organised teams in various roles working together to bring the idea as efficiently and as quickly as possible to fruition.



The various stages of creative thought begin with a preparatory stage where a challenge is identified.

Though there is no consensus view amongst neuro-psychologists the next stage of incubation is believed to be an unconscious process where the problem we are trying to solve is forgotten on a conscious level but is being worked in the cognitive unconscious (we often describe this as ‘sleeping on it’) . This is followed by the moment of insight – the ‘eureka’ moment when the solution or idea arrives in conscious awareness.

After this we move into the Innovation phase ie the idea is communicated and evaluated. If it is deemed a worthy solution the idea is then detailed with appropriate actions and approvals and then put into action. The aforementioned stages are cyclic and in the elaboration stage new problems are identified which then begin a new cycle for their solution. So as solutions to the main challenge are acted upon other perhaps lesser problems are identified which may need to undergo the same process.

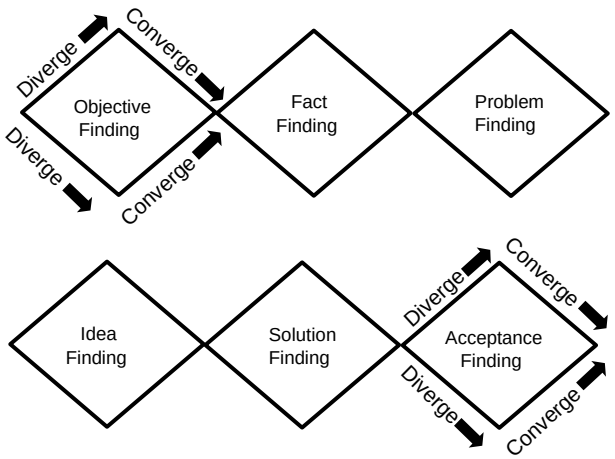


In the preparation stage challenges are identified. These challenges aim to bridge discontinuities or gaps ie The space between where we are now and what we would like to achieve. For students this may be expressed as an open-ended project that they are tackling. For teachers it may be in the defining stage of new research or in the design of a new course. On a more personal level the gaps may be things we want to achieve through our own career development or they may simply be issues that we have been facing at work that don't seem to disappear with time.

Having identified a challenge it invariably requires preliminary work to re-frame it in a way that makes it more amenable to creative problem solving. This process is known as abstraction where we dig deeper to define the problem in a wider sense. Many problem-solving activities fail at this stage if this process is ignored because we haven't got to the heart of the challenge itself.

Having re-framed the challenge we can next apply a number of creativity tools and techniques to find novel ideas that can solve the problem. There are many tools and techniques and we all use some of these instinctively to solve problems. However we can always learn new ones and it is often surprising to see the range of new ideas that emerge when we try a different approach. Tools and techniques really come into their own when we have run out of ideas or are too close to the problem to see different perspectives.

Osborn –Parnes Creative Problem Solving



Creative problem solving can be approached in a systematic way and one technique that has found widespread application in the USA and Canada is known as the Osborn-Parnes process. This process was first developed by Alex Osborn who coined the phrase ‘Brain-Storming’ in the 1950’s. Later working with Sid Parnes and others associated with CPSI The Creative Problem Solving Institute the process was fully developed.
It consists of six stages and at each stage two modes of thought are applied. Divergence comes first in which as many thoughts as possible are written down in connection with the particular stage of the process. Divergent thinking looks outside the boundaries that define the problem. In this mode of thought it is essential to defer judgement on the value of any ones' thoughts until enough of them have been generated. This is a learnt skill and the more debate that ensues the fewer ideas are generated during this time. Convergence comes next where we select from the list those ideas that are the best and here judgement is essential. This should be a democratic process and it is useful to remember three criteria for selection: These are Importance ie How important is this idea or problem ?, How much Influence do you have in effecting it ? How much does it represent or need a New Idea ?

Note that Idea-finding is the fourth stage in the Osborn-Parnes process not the first. Often brain-storming meetings begin at this idea-finding stage before the real problem has been identified. Furthermore they often end here too with a list of ideas but no further action.

The Creative Process

- **Preparation**
  1. **Awareness of discontinuities or gaps**
  2. **Abstraction**
  3. **Creativity Tools**

We begin the process with a challenge that we have identified. Below are some prompts describing typical challenges.This is Objective finding in the Osborn-Parnes process. These prompts along with the prompts for the SCAMPER tool described later are taken from the book 'Thinkertoys' by Michael Michalko.

What would you like to accomplish ?
What idea would you like to work on ?
What do you wish would happen in your job ?
What is the next research topic ?
What relationship would you like to improve (Internal/External customer)?
What areas would you like to improve upon ?
What do you wish you had more time for ?
What more would you like to get out of your job ?
What are your unfulfilled goals ?
What changes would you like to introduce ?
What takes too long ?
What is wasted ?
What is too complicated ?
Where are the bottlenecks ?
In what ways are you inefficient ?
What gives you stress ?
What in your job do you least like doing ?
What would you like to organize better ?

Identifying the Objective (Challenge)

Reactive Conversations

- ***Evasive Conversations:***

  Disguising the Truth
  Withholding Information
  Withdrawing Emotionally or Physically

- ***Conclusive Conversations***

  Opinion Dump
  Labelling

Creative Conversations

- ***Transition Conversations***

  Taking Responsibility
  Equanimity
  Shared Intentions

- ***Expansive Conversations***

  Researching Common Ground
  Identify Facts
  Inquiry
  Expand point of view

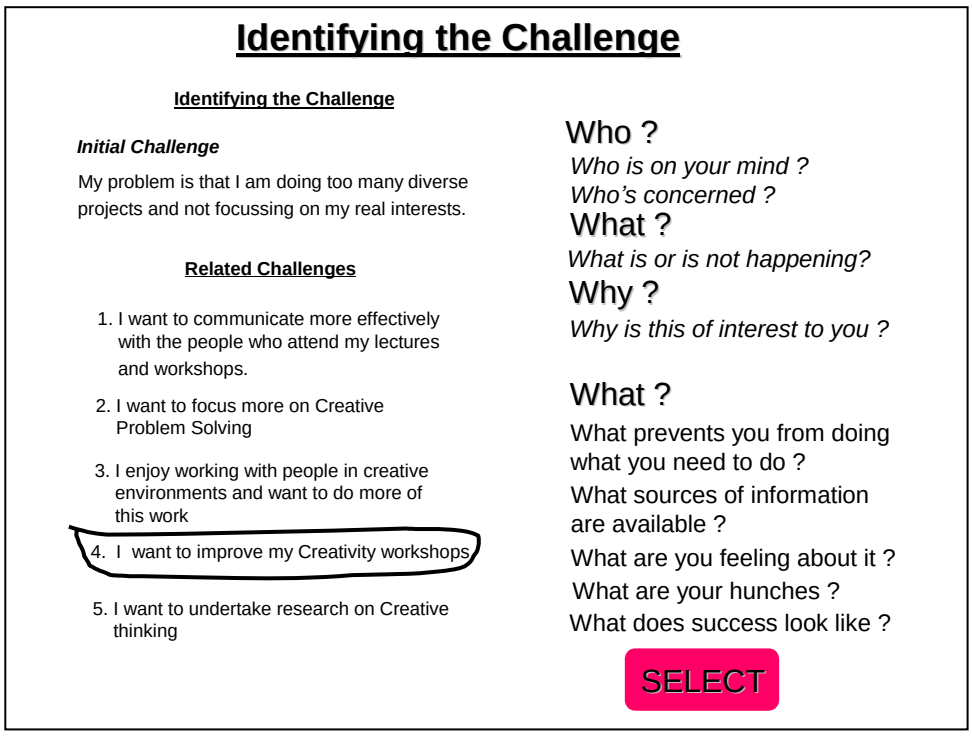
- ***Creative Conversations***

  Combining Ideas
  Building Partnerships

These different forms of conversation are attributed to Leslie Becknell and The Centre for Authentic Leadership.

We started with the broad challenge: '…… ' After these conversations more specific challenges were identified and participants then formed new teams under the Challenge of their choice.

Normally a challenge has been identified that the team share beforehand but the approach used here is suitable for when a diverse group of people meet for the first time.



In what follows I have used a personal example and whilst MarkTwain would have it that: "Few things are harder to put up with than the annoyance of a good example." It is hoped that this will illustrate the process in action.

Write down your initial challenge in the form " My/Our problem is……..."

Diverge

Having identified a challenge and written it down we now Diverge by finding facts and identifying other related challenges. These can be found by using the prompts Who ?, What ?, Why ?,When ?, How ? and Where ? With each of these think up questions such as "Who is on you mind" Try and write down as many questions and then find new related challenges that are prompted by these questions (a good target is 15)

Converge

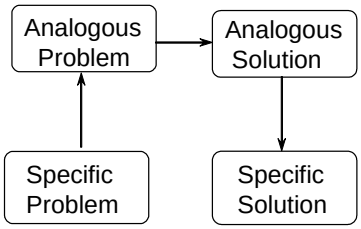
Having written as many related challenges give yourself (or maybe someone else) a criterion for selection and choose the one that engages you both intellectually and emotionally. Which expression of the challenge has some 'heart' that motivates you to work with it ?

Using the Who?, What ? Why ? Prompts we are Fact-Finding around the original challenge (objective) which takes us into the second stage in the process.

The Creative Process

- **Preparation**

1. **Awareness of discontinuities or gaps**
2. **Abstraction**
3. **Creativity Tools**

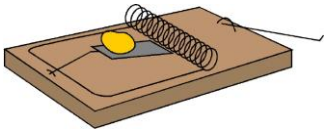


The next fact-finding step is to abstract the challenge. We need to do this to avoid solving problems in the familiar way within the boundaries of our training alone.

This conventional approach is illustrated above.Suppose our challenge was “Design a better mousetrap”(Specific problem) The usual way to go about this is to study existing mousetraps (Analogous problem) and incorporate the best design features and eliminate the worst design features (Analogous solution) and we finish up with our own unique design (Specific solution). This is all well and good and it is how we solve problems much of the time. This is incremental progress and is often how established businesses progress because it is low risk. However it is not particularly creative and is unlikely to lead to innovative breakthroughs that can enable a company to take a lead on the market. Furthermore this approach does not future-proof a business against the inevitable problems that arise as a result of changes in the economy, new competitors,new ways of working etc.

Abstracting the Challenge

"*A problem is half-solved if properly stated*." John Dewey



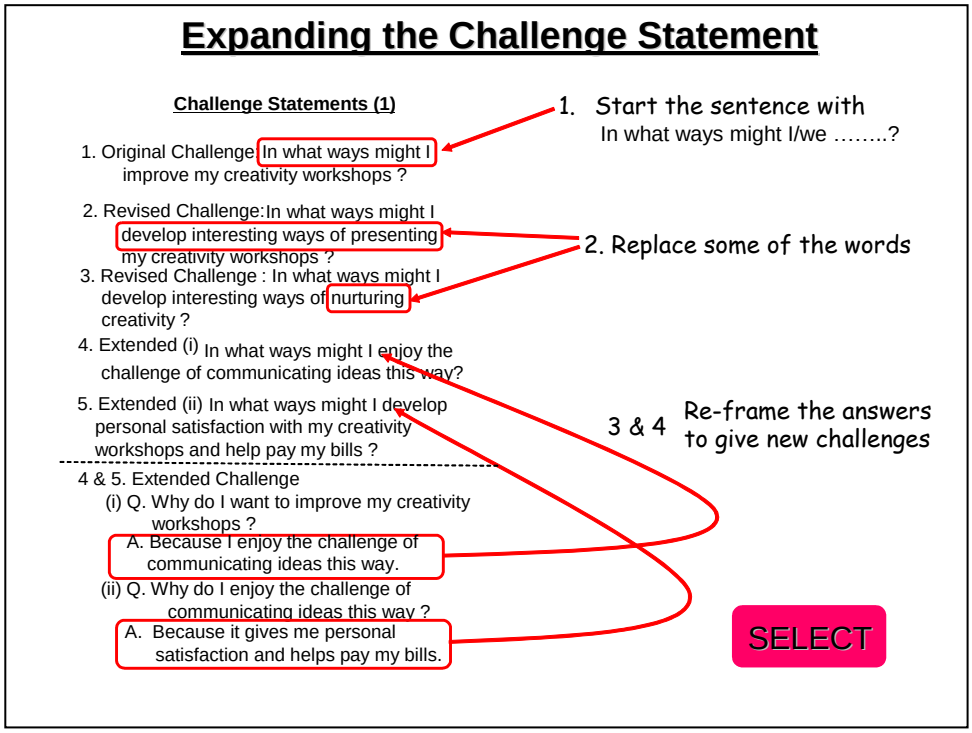
How do I build a better mousetrap ?

How do I get rid of the mice ?

"My problem is that my administrative work-load is too time-consuming"

" In what ways might I make my administrative work-load less time-consuming "

To open up our challenge to more creative opportunities we abstract the challenge which means asking a different question. In the case of the earlier example instead of asking "How do I make a better mousetrap" we might ask "How do I get rid of the mice." This prevents us from following the familiar analogous path described earlier and opens up new avenues of thought. Getting rid of the mice still meets the original challenge but we have many more options to think about now just by re-framing the challenge.



Having selected our earlier challenge we re-frame it first by writing it in a positive way ie instead of saying “My problem is ……” we begin with something like “In what ways might I……..” this immediately changes ones’ emotional engagement with a problem and moves us to solve it.

Diverge

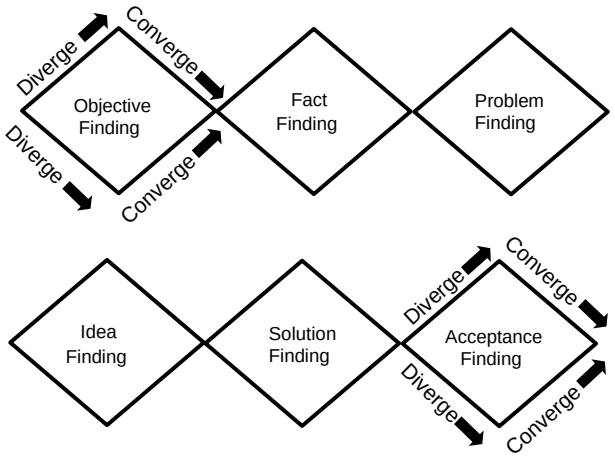
The next thing to do is simply re-phrase the challenge using similies. This can be done several times if desired. Now ask a question about the initial challenge and from the answer form a new challenge. This can lead to a new question and a new challenge. Alternatively go to one of the challenges with revised words and ask a question about that and a new challenge will emerge. This can be repeated until a number of variations on the earlier challenge have been created.

Converge

Now select from this list the challenge statement that appeals most. For a more quantitative approach give each challenge a score (or scores if this is a group challenge.) For convenience we now define the challenge as a problem as it is a honed down version of a much broader challenge.

We are now at Stage 3 of the six stage Creative problem solving process

Osborn –Parnes Creative Problem Solving



To re-cap we started out with a broad challenge (objective) and by finding facts prompted by the 5W's+1H (What?,Who? Etc) we opened up the challenge to a list of related ones. After selection we then abstracted this challenge and by asking further questions continued the fact-finding to finally come up with a problem. This was expressed in a positive way to move us to seek creative solutions. Before finding solutions we move on to the next stage – Idea-Finding.

'Idea-Finding' is where the creativity tools and techniques are used most. It is beyond the scope of this short workshop to cover all the idea-finding techniques but suffice it say there are many different ones from brain-storming to dreaming. But recipes for using two tools are supplied: SCAMPER and Analogical Brainstorming.

Tools and techniques are only one aspect of what could be called a creative attitude. Just as important are certain 'behaviours' that can put us into a more creative mindset.

Nurturing Creativity

'Tools'

Brainstorming

Conceptual Combination

Changing 

Analogy / Metaphor

Brainstorming: This is a free association technique. The time spent on a brainstorm is very important. The point of ambiguity when all the immediate associations have been listed is rarely reached and it this that can bring the really novel solutions. The environment is an important influence on the ideas emerging in a brainstorm and three techniques that can bring more results from a brainstorm are:

1. Use visual stimuli – Look at a variety of images and list the verbs associated with the images then return to the brainstorm problem.
2. Use the 5W's +1H to ask questions about the problem.
3. Find associations by asking questions about the senses: What does it look like?, What does it sound like ? How does it feel ? Etc.

Conceptual combination (see later)

Changing Perspective: There are many techniques for shifting perspective – We will be using SCAMPER (see later)

Analogy/Metaphor: Ask What is this like ? Explore an analogy of the problem. eg The workplace is like a jungle – explore the analogy and see how each part of it translates back to the problem. The analogy may supply answers to gaps in the problem.

Nurturing Creativity

'Behaviour'

Intuition Building

Common Sense
Experience
Sensitivity
Luck

Attention Span

Creativity tools and techniques are of little value if one does not have a creative attitude. Four behaviours that can be further developed are:
Intuition Building: Intuition is related to the unconscious aspects of the creative process. Intuition is defined as direct knowledge without the intervention of conscious reasoning. Intuition builds on existing knowledge and experience and intuitive sensitivity can be nurtured by keeping a journal and recording your guesses and hunches about the changes you observe in the workplace. By checking back over a month or so at which recorded notions became so and which did not, one can identify subtle patterns and a greater sensitivity to the difference between guess-work and intuition
Attention Span: Our attention span has been reduced somewhat in recent years due the accelerated pace of change in the workplace. Again our creativity is influenced by attention span and it is desirable to both extend and broaden it at times. To extend your attention try resisting the temptation to break from a task for a coffee as an excuse for putting it off. By staying with it at that time requires discipline and just taking it that stage further before taking a break may bring greater progress and new ideas. Furthermore it's worth observing what happens in a creative sense when you take the deferred rather than the habitual break ! To broaden attention is much more enjoyable and again feeds creative thought. Try focussing your attention through the different senses individually ie be aware of your sense of touch when you are usually focussed on seeing. Be aware of which senses are dominant in different tasks and try and bring you attention focus on another sense instead. When looking for ideas try asking what does it look like ? What does it sound like ? etc.

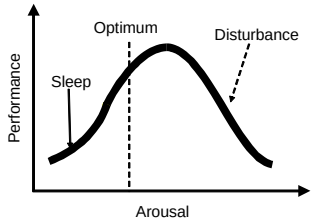
Nurturing Creativity

'Behaviour'

Visualisation/
Meditation/Dreaming

Lifestyle

Stress & Emotion,
Time Management



Visualisation: By shifting the focus of our attention we can gain insights into problems. Internalising a problem and seeing it in the mind's eye in a relaxed state has been shown to be an effective way of both solving problems and improving ones' performance in almost all areas of human activity. One way to develop a habit of visualising is to resist the temptation to write or to talk about problems but just relax and observe the problem as if on a screen in your imagination.
Taking a few minutes to visualise successful completion of a daunting task beforehand can help a great deal. eg Before giving a presentation visualise yourself standing up in front of the audience, speaking clearly, answering questions fully etc.
Lifestyle: Managing our emotions plays a key role in the development of creative behaviour. Too little emotional engagement and we don't feel moved to find creative solutions and just stay with the 'known'. Too much emotional engagement probably because we are under pressure elsewhere and our performance dips. When further arousal results in poorer performance we are under stress and need to find our way back to the optimum arousal point. (see graph above of performance versus arousal)

Idea Finding

- **Ask " What if ?"**

Substitute

Combine

Adapt

Modify

Put to other uses

Eliminate

Reverse

An Idea Finding technique that is effective in all areas of problem-solving Is called SCAMPER. It consists of a series of transformations that can be applied to the problem to enable you to shift your perspective on it. SCAMPER was developed by Bob Eberle who worked with Osborn and Parnes in the USA.

Each transformation is prefaced by asking 'What if ?'
In the examples above SCAMPER has been applied to inventions.
SUBSTITUTE: Copper cable for Optical fibre -This revolutionised the telecomms business.
COMBINE: Combine a clockwork dynamo with a radio and we have the clockwork radio. (Combining is given a separate section because this lies at the heart of the big creative leaps.)
ADAPT: Nature is the greatest inventor and by natural selection variations in species have arisen through adaptation to different environments. Variations in the design of inventions are often adapted to different markets eg Cars - 4WD sports,,saloon, MPV,Executive etc
MODIFY (Magnify/Minify): Alastair Pilkington magnified the phenomenon arising from surface tension of flat oil drops floating on water. He SUBSTITUTED the materials for liquid glass floating on liquid tin and this was how Float glass was developed.
PUT TO OTHER USES: Velcro was invented when the attachment mechanism of cockleburrs was put to another use (after SUBSTITUTION for another material.)
ELIMINATE: The computer industry has been driven by the need to eliminate wasted space on silicon chips by reducing the size of logic elements in order to increase their density and hence their processing power.
REVERSE: By creating artificial opals (closely packed silica spheres) and in-filling the gaps then dissolving the spheres we are left with an inverted Opal. This has potential application for photonic circuits (Circuits using light instead of electricity)

SCAMPER in Cookery

S - Substitute	Meat for Tofu
C – Combine	Indian + Italian Food (Tandoori Pizza)
A – Adapt	Chop-Suey (Not authentic Chinese came from USA)
M – Modify/Magnify	Meusli Bar (A cereal is modified to a confection)
P - Put to other uses	Nouvelle Cuisine (Make the presentation a work of art)
E – Eliminate	Alcohol free Lager
R - Reverse or rearrange	Calzoni (An inverted Pizza with the topping inside)

SCAMPER can be applied anywhere where new ideas are being developed. The above examples are taken from the culinary world.
It is important to note that the examples of SCAMPER described in this and the previous slide are retrospective observations of where this technique has been applied. Whether or not the creators of these ideas in the examples given were asking “What If I ….SUBSTITUTE/COMBINE etc when they came up with the idea is mere speculation. As mentioned earlier many creative leaps happen unconsciously but there is no doubt that this tool can be applied successfully in a conscious way if the inspired ideas are not forthcoming.

We will apply SCAMPER to find Ideas that can help solve the problem we have defined. As you familiarise yourself with SCAMPER it becomes apparent that some transformations give more ideas than others on different types of problem. It is not necessary to find ideas from all of them but when you have completed the process it is definitely worth another look at the places were ideas were not forthcoming. You may find that new ideas have been prompted by ideas that emerged earlier. The following SCAMPER prompts are quoted from Michael Michalko’s book ‘Thinkertoys’

Substitute !

Personal Challenge:

What can be substituted ?
Who else can help ?
Can the methods be changed ?
Different Ingredients, Material ?
Other Processes or Procedures ?
Another Place ?
Another Approach ?
What could I do instead ?

Look at your chosen problem and ask the 'SUBSTITUTE' questions above. Is there anything that comes to mind ? Write down as many ideas that relate to substitution. Try not to judge any idea at this stage just collect ideas even if they appear wacky. As an example I have selected the following problem relating to the creativity workshop that I would like to solve ?:

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

SUBSTITUTE

What can be substituted ? - Could I substitute Powerpoint for something else ? Could I substitute a visual presentation ? – CD ROM maybe ?
Who else can help?- Spend some time at a particular business and become immersed personally in the problem. See it from the employees perspective instead of describing general ideas.
Another Approach ? – Develop the workshop as a board game ?
Different Ingredients ? – Keep changing the material and find new examples so that the presentation doesn't become routine – find examples from the customers I will be working with ?

Adapt !

Personal Challenge:

What else does this resemble ?
What other ideas are related to this ?
Is there a precedent we can learn from ?
How do I adapt it for a different internal customer ?
How do I adapt it for a different external customer ?
How do I adapt it to a different market sector ?
What could be copied ?
Whom could I emulate ?
What else could be adapted ?
What different contexts can I put my ideas into ?
What ideas outside my field could I incorporate ?

Although the next item should be COMBINE we have deferred that until later because COMBINING is perhaps the most important creative transformation and also the most challenging.

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

ADAPT

Whom could I emulate ? – Attend other creative problems solving workshops and adapt the presentation techniques.
What different contexts can I put my ideas into ? – Improve the presentation by using characters and stories as contexts to illustrate creative thinking eg Alice in Wonderland, Star Wars etc.
How do I adapt for a different market sector ? – Creativity for kids, retired people, unemployed, Universities.
How do I adapt for a different market sector ? – Tailor the workshop according to the business eg High Tech – use more examples related to invention. Public Relations/Marketing business – use examples from advertising etc
Is there a precedent we can learn from ? – Research the creative thinking of great people of the past: Plato, Da Vinci, Einstein – market it with a different name – 'Solve Problems like Einstein !'

Modify !

Personal Challenge:

What if I change the colour,shape, form,feel,
scent, sound, movement ?
What if I scale up the idea/object in size?
What if I scale down the idea/object in size?
What if I multiply it – repeat in different places?
What changes can I make further up/down the system ?
What can be modified ?

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

MODIFY

What if I scale down the idea ? – Explore one-to-one creative problem solving (The growth in the life-coach industry might suggest there is potential here)

What if I multiply it ? – Develop the workshops as a distance learning Module. What about e-learning ?

What changes can be made further up/down the system ? – Am I marketing it to the right people ? Should I be targetting people further up/down the company management structure?

What if I scale up the idea ? – Am I marketing it enough ? – Mailshots ? Website, Publications, Advertising, Networking ?

NOTE

This last question can be seen as a new problem and such examples are worth noting for a later separate SCAMPER session. It may be an obvious first thing to ask myself given the current problem but many times the obvious can be lost in the near field of what we already think is the solution. This is why it is so important to constantly defer judgement and wait until all the ideas have been gathered.

Put to Other Uses !

Personal Challenge:

What else can this be used for ?
What other ways can I do this ?

Know Thyself !

Many ideas emerge from simply looking at an object, an idea, a method etc and saying 'What other uses can I put this to ? With certain problems that we are facing it can be a prompt to include oneself in the problem and say what can I learn personally from this ? For example if this particular problem is similar to others that we have encountered in the past maybe the problem is in oneself. So 'Put to other uses' can be a way into our own self-observation. This is particularly true if the problems concern relationships with other people. If the problem has been identified as something closer to home rather than a genuine external problem we maybe need to nurture our creativity in a different way to to solve it. The tools more appropriate to this kind of work (which we all needin this fast paced world) are the 'Behavioural' ones described earlier.

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

What other use can I put this to ? – Instead of looking at the good points in the feedback I receive I should be working more on improving the areas that score low.

What else can this be used for ? – In developing and presenting my workshops I have learned new skills eg Making visually attractive Powerpoint presentations, Facilitation and lecturing skills. Could I market other workshops on eg Presentation Skills ?

Eliminate !

Personal Challenge:

What should I omit ?
Should I divide it ?
Should I separate it ?
Streamline ? Miniaturise ?
Subtract ? Delete ? Remove ?
What's unnecessary ?

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

ELIMINATE

What should I omit ? – To market my workshops I need to differentiate myself from competitors – The word creativity is becoming too commonplace – What if I omit it and work from another perspective eg Intuition, productive thinking etc ?

Streamline/miniaturise ? – Maybe I need to make a separate business card that just markets my workshops rather than the more generally descriptive one.

See next slide for another use of Eliminate

Eliminate !

Personal Challenge:

What should I omit ?
Should I divide it ?
Should I separate it ?
Streamline ? Miniaturise ?
Subtract ? Delete ? Remove ?
What's unnecessary ?

The demands that are put on us in the workplace are greater than they have ever been. In a sense we are under stress from the fight to compete in an expanding market and to deal with rapid and unpredictable change driven by technology and other social and economic factors. This stress is usually distributed unevenly across the various groups in the organisation. In turn this is distributed across the individuals or teams within a group. One perennial problem that we face in the workplace is how to deal with the extra demands that are constantly put upon us. In order to further our career we tend to assimilate new responsibilities even though we were already fully extended with the current ones. Whilst we remain in the left hand side of the graph on slide 16 this is fine because it means we are able to continue working efficiently with the added task that we have been given.
However each new task takes us nearer to the top of the graph and down into the zone of stress. Once we have entered this zone we and all of the tasks we have been assigned start to suffer. We are simply not working efficiently and are no longer enjoying what we are doing. We are more prone to making mistakes in this zone and our creativity diminishes so there is a knock-on effect to the group or the business as a whole. If we know we are in this zone, it is important to make creative changes to our time-management and our lifestyle at work as correctives. However one immediate remedy when we are in this zone and are given new tasks is to say at the same time 'What can I eliminate' In other words to accommodate new tasks others may need to dropped.

Reverse !

Personal Challenge:

What if I turn it inside out ?
What if I do the opposite ?
What if I reverse roles ?
What if I work backwards ?
What are the negatives ?

Reversing is one of the more challenging transformations but it is an important one because it questions fundamental assumptions (see next slide.)

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

REVERSE

What if I do the opposite ? – Instead of marketing my workshops along the lines of nurturing creativity, why not assume the clients are already very creative – Maybe a workshop then becomes more targeted at throwing out creative habits that are not working for us. Maybe the focus is more on the behaviours rather than the tools.

What if I reverse Roles? – Design a workshop where I help to solve the clients' specific problem instead of giving general ideas and asking them to find the ideas ?

Reversing Assumptions: The Monty Hall Problem

There are three up-turned cups and under one of them is a gold coin. You are invited to choose one of the cups and if you guess correctly the coin is yours. I know where the coin is and after you have chosen I select one of the other cups and turn it over showing you that it is not there. I then ask you if you want to change your mind and choose the other cup. The problem is this: If you change your mind do you in general have a better chance of winning the coin ?

Most people tackle this at first by working out the chances of winning before and after the empty cup has been revealed. This (erroneous) line of reasoning goes – There is a 1 in 3 chance of my selecting the right cup. When the other cup has been turned over there is l in 2 chance but there's no advantage in changing my mind so I'll stick with my first choice.
Let's see what happens if we reverse our assumptions and ask the question 'What is my chance of losing ?' Well there's two ways we can be wrong first as there's only 1 cup with a coin under it. ie I'm more likely to be wrong than right in my first choice. Therefore changing my mind after one of the cups has been shown to be empty means I have a higher chance of being right. This is known as a counter-intuitive problem because it goes against common sense. The next slide shows all the possible outcomes and verifies that changing your mind is the best strategy.

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

Assumptions

1. The business needs to be developed
2. I will get more work if I develop the business.
3. I know how to market my business.

Reversed Assumptions

1. The business does not need to be developed.
2. I will get less work if I develop the business – There is a steady flow of requests for the workshops already.
3. I do not know how to market my business – maybe I need to be trained in these skills.

Having looked at the reversed assumptions I can fact find to see whether they are upheld or not. If one of them is upheld it might mean the problem as stated has not got to the heart of the matter and may need re-stating. By deliberately challenging your own assumptions and saying what if …….were not true (even if it is) it can throw up new ideas that wouldn't otherwise have been seen.

Monty Hall Dilemma

Assume the coin is under A

Your Choice	Change Mind ?	Outcome
A	No	✔
A	Yes	✖
B	No	✖
B	Yes	✔
C	No	✖
C	Yes	✔

This summarises the various outcomes if the gold coin was under cup A. We see that if you change your mind you are twice as likely to be right.

A full discussion on this problem can be found in ‘The power of logical thinking’by Marilyn Vos Savant.

Combining

"Definition of the creative act - the combination of previously unrelated structures in such a way that you get more out of the emergent whole than you have put in"

Arthur Koestler (The Act of Creation)

"Ideas arose in crowds, I felt them collide until pairs interlocked so to speak making a stable combination. among the 'stable combinations' the most fertile will often be those formed of elements drawn from domains that are far apart"

Henri Poincare

Combining has been left to the end because it is the transformation that brings the most radically creative ideas. The Combining of ideas is at the heart of most new trends, fashions, artefacts, inventions, processes etc. There is nothing new under the sun apart from new combinations of existing ideas. In the world of science discoveries are never planned but the new technologies arise out of exploiting and combining new discoveries with existing technologies. In the world of design whether it be hairstyles, clothing, buildings, cars etc the new trends can always be traced back to combinations of ideas. New music trends are combinations of older styles indeed the word 'fusion' is often used to describe this process eg Jazz with Blues. By definition you cannot get something from nothing so the next best thing is to combine. Many new business ideas are combinations of earlier ideas eg Many petrol stations are now combining the basic function of filling the tank with a shopping experience.

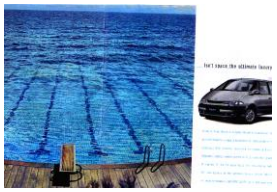
Success lies in finding the combinations that really work and these will be the exception rather than the rule. This brings us back to the essential 'risk-taking' involved in creative work. We will make more mistakes in combining inappropriate elements but when the right combination is found we leapfrog other more conventional solutions to problems.

Conceptual Combination

Inventions

Coin Punch + Wine Press = Printing Press

Advertising



Humour

Scotsman + Walt Disney

Examples of Idea Combining:

In the 15th century Gutenberg came up with the idea of the printing press when he combined the mechanisms of a wine press with a coin punch. All inventions are combinations of ideas and to take a more modern example the clockwork radio combined a clockwork dynamo with a radio. In the high tech world separate technologies which in themselves consist of many combined ideas, can be combined to produce revolutionary new ideas. Eg Agilent Corp combined the physical layer of Internet technology with Ink-jet printing technology to produce an all-optical switch.

In advertising ideas are combined to create advertisements that make us look twice because they at first sight seem incongruous for example a car company wanted to get across the message that their people carrier was spacious and safe at the same time. They combined these two ideas in the visual analogy of a large expanse of sea made safe by making it look like a swimming pool.

The best jokes combine ideas and the surprise element that makes us laugh comes in the punch-line: What is the difference between a Scotsman and Walt Disney? – A Scotsman wears a kilt but Walt Disney !

Combine !

Personal Challenge:

What ideas can be combined ?
What about combining units or departments ?
What materials can be combined ?
What methods could be combined ?
What tasks can be combined ?
What procedures could be combined ?
What functions could be combined ?
What could be included with this idea ?
What about a blend, mixture or assortment ?

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*

COMBINE

What about combining units or departments ? – What if I offer my workshop to a training organisation or agency rather than marketing myself as an independent.

What tasks could be combined ? – What if I market a workshop on creative presentation skills ie Combine two workshops ?

What ideas can be combined ? – Could I include some marketing in my actual workshop presentation ie quotes from satisfied clients etc ? Examples of solved problems that may have been helped by the workshops

A useful tool to assist in Combing Ideas is known as 'Forced Connections' and a method for applying this is given below.

Forced Connections

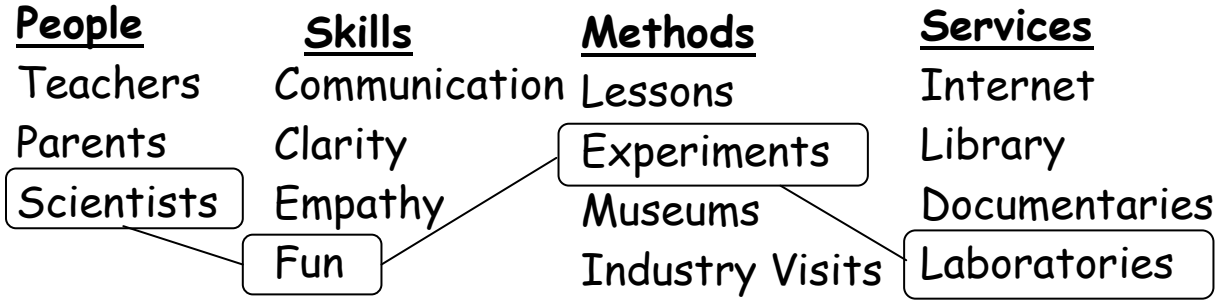
1. Identify Parameters of the Problem (up to 4)

   e.g. Materials, Methods, Types, Processes, Equipment, Properties, Forms, People, Products, Services, Markets, Functions, Marketing, Skills,

2. Brainstorm each parameter for different variations.

3. Draw a Matrix and make random connections across the different parameters.

Example: How could school kids become more interested in Science ?



Analogical Brainstorming

Below are the steps to exploring a more familiar scenario and then finding equivalences in the area in which the problem resides.

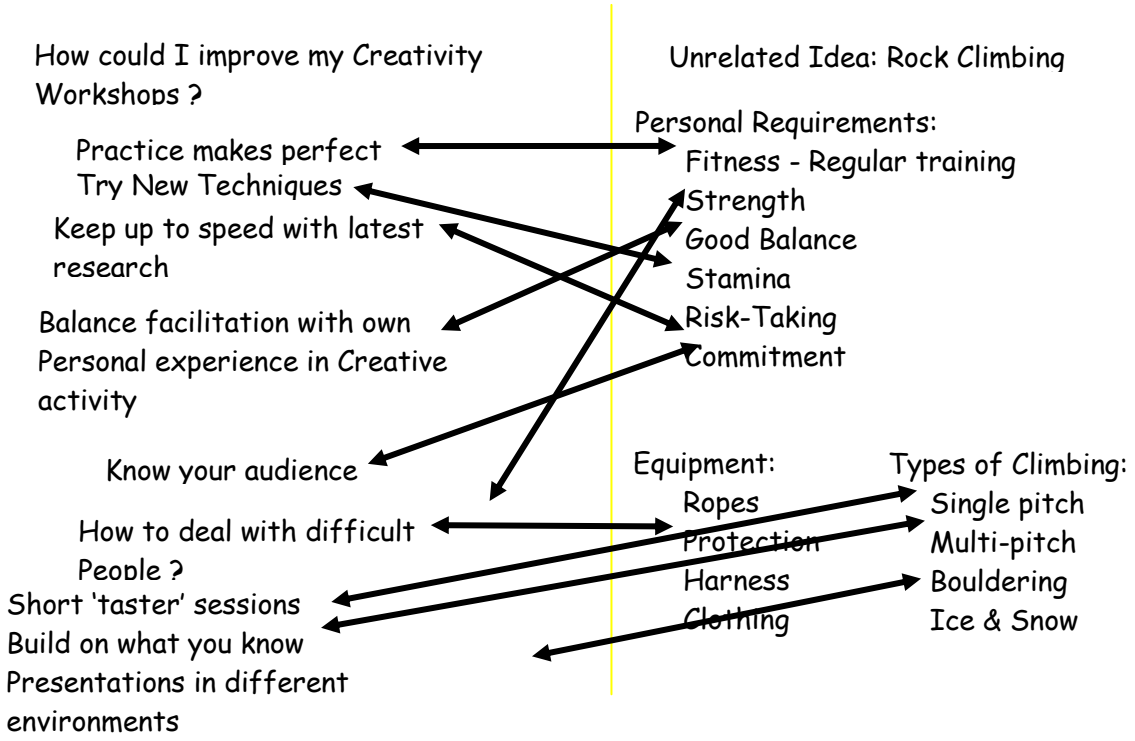
1. Choose a Key word or Phrase in the Problem.

2. Ask the team to agree a distant parallel activity
   Virtually anything will give good results eg Planning a Holiday, Raising Children, Cooking a meal etc etc.

3. Ask participants to temporarily forget the problem they are working on and list some of the images associated with the parallel activity.

4. Look for connections between these two worlds.
   Best not to force connections rely more on visualising.

5. Look for connections that might bring new ideas to the problem.



Combining Creativity Tools & Behaviour

Virtual Boardroom + Visualisation

Customers
Manager
Competitors
Colleagues

The various techniques for nurturing creativity described in slides 14-16 do not have to be used in isolation but can be combined also as a means of generating new ideas. Here we combine the virtual boardroom with visualisation.
The virtual boardroom is a way of Idea-finding based on shifting perspective and seeing the problem through the eyes of someone else eg a customer or a competitor. By spending some time on this through visualisation rather than just thinking about immediate associations one can learn to see things in completely different ways.
Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*
Customers:
What does a customer want from a creativity workshop? – solutions relevant to their business.
How would they see the marketing blurb ? –Customise it ?, Does it live the very subject it purports to nurture ?

Try combining Virtual Boardroom with SCAMPER and a whole new range of ideas will emerge.

Solution-Finding

Review All Ideas from:

SCAMPER
Who,What,Why etc
AssumptionTesting
Forced Connections
Analogical Brainstorm

Circle or mark your top 5 ideas i.e. Ideas that may have the greatest potential (retain other ideas.)

Having created lots of ideas around the problem we next move on to the penultimate step in the Osborn-Parnes process – Solution Finding. However before doing this it's worth reiterating the Incubation process – sleeping on ideas or at least take a break away from the problem. Then come back half an hour later or the next day and see if any new ideas have emerged. If so add them to the list.

Solution-Finding:

Bring together all the lists of ideas from Brainstorming the problem (and the techniques associated with it), from SCAMPER, testing your assumptions, analogical brainstorm and the virtual boardroom and make one big list. This listing can be done on a note pad or better still on a flipchart especially if there is two or more people involved. Go through the list see if they can be grouped into categories. Then give each group or if individual idea and every idea a score out of five say. If it is a team problem every team member should score every idea. Decide first how you are going to determine a score. Maybe there is more than one criterion in which case have multiple scores per idea and use coloured pens to differentiate them. eg the different criteria might be Originality, Practicality, Cost, Risk etc. Be careful not to have too many criteria – rather chose those that relate the closest to the nature of the problem. Another way to deal with these ideas is to classify them as Strengths, Weaknesses, Opportunities and Threats (SWOT) before selecting.

Now add up the scores for the separate criteria and circle the top five. Clearly if you have too many different criteria ambiguities will appear and you may have to rank the criteria themselves.

Shaping the idea **Solution-Finding Table**

Selected Ideas	Criterion 1	Criterion 2	Criterion 3			Total	Pass	Hold
1.								
2.								
3.								
4.								
5.								

Score selected Ideas: 1 (Low Value,) 2, 3, 4 (High Value.)

Example Problem: *In what ways might I develop the business of my creative problem-solving workshops ?*
Top Results from Idea-Finding:
Of the 25 ideas that emerged using the Idea-Finding tools the following scored highest on the criteria of practicality and originality.
Who else can help?- Spend some time at a particular business and become immersed personally in the problem. See it from the employees perspective instead of describing general ideas.
How do I adapt for a different market sector ? – Creativity for kids, retired people, unemployed, Universities.
What if I scale up the idea ? – Am I marketing it enough ? – Mailshots ? Website, Publications,Advertising,Networking ?
Streamline/miniaturise ? – Maybe I need to make a separate business card that just markets my workshops rather than the more generally descriptive one.
What ideas can be combined ? – Could I include some marketing in my actual workshop presentation ie quotes from satisfied clients etc ? Examples of solved problems that may have been helped by the workshops.
Virtual Boardroom:Customers - How would they see the marketing blurb ? – Customise it ? Does it live the very subject it purports to nurture ?
Some of these are ideas that can be developed right away and others need further research and fact-finding.

Acceptance Finding

Actions	Idea 1	Idea 2	Idea 3	Idea 4	Idea 5
1. Who will be involved ? **2. Who's Approval is needed ?**					
3. What resources are needed ?					
4. What has to happen ?					
5. When do we start ? **6. What is the deadline ?**					
7. How will it be implemented?					

This is the final stage in the process where an action plan is developed for the chosen solutions. First of all identify a list of necessary actions to ensure the ideas do not just disappear. Some examples are shown above in the table. For each idea in the top 5 selected, write notes on how the various actions can be fulfilled. The person who owns the problem commits to the dates and resources for completing the selected actions.

The only way to prove the whole process works is to find acceptance for it ourselves and this comes from actually applying it. Many new ideas can seem obvious to some people – particularly those not faced with the problem in the first place. In answer to this it is worth remembering that many ideas are only obvious in hindsight. Furthermore those not involved would be unaware of the earlier stages in the process. This can be summed up by saying we often know there's a problem but we often don't know what the heart of it is neither do we express it in a way that will give us solutions. Finally in going through the ideas described here it's worth mentioning once more the importance of deferring judgement of ideas at all stages. In this way we are more receptive to surprising ourselves about how much we knew - but didn't know that we knew.

See next slide for further work in Creative Problem Solving

ETC is a training organisation offering workshops on Creativity and Creative Problem-Solving. The workshops explore two complementary areas of creativity: Tools and Techniques and Behaviours. Throughout the workshops exercises are provided to enable participants to apply these tools and techniques and to experience first hand how various creative behaviours can be nurtured.
The overall structure of the workshop is based on the tried and tested Osborn-Parnes Creative Problem Solving methodology which has been in widespread use in businesses in the USA and Canada for many years. Where appropriate the various creativity exercises will be put in the context of the most recent findings in the fields of cognitive psychology and neuro-psychology.

Two types of creativity workshop are available:

- Workshops for general staff development and training in Creativity and Creative Problem Solving.

- Workshops for solving a specific problem that is being tackled by a group or a team within a business or educational institution.

The workshops are a half or full day in duration and group sizes of up to 30 people can be accommodated for Workshop 1. A typical maximum client group for Workshop 2 is 10 people.
Further details are available from Kevin Byron by calling 07787856069 or by e-mail at kevin.byron@ntlworld.com