Introduction

In order to develop innovative products, services or procedures, organisations must encourage their employees to become more creative. One method of undertaking this is to utilise creative problem-solving techniques (VanGundy, 1992; Von Oech, 1983; Carr, 1994; de Bono, 1992; Robinson and Stern, 1997). There are numerous types of creative problem-solving techniques. VanGundy (1992) has classified these into techniques that are used by individuals and those that are utilised by groups. In addition, he has also divided them into techniques that use related stimuli and those that use unrelated stimuli. Perhaps the most popular technique is that of brainstorming, where group members communicate ideas to the facilitator who writes them down on a board or flip chart. VanGundy (1988), McFadzean (1998a) and Couger (1995) have also described countless other creative problem-solving techniques. The purpose of this paper is to develop a framework that will enable team members and/or facilitators to choose which is the most appropriate technique for them to utilise. In addition, the paper will also discuss the implications for choosing particular techniques and will describe the strengths and weaknesses of these methods. The next section of this paper, therefore, will present the creative problem-solving framework. The remainder of the article will describe some of the techniques and their implications. Finally, a summary of the paper is presented.

The creativity continuum

Newell et al. (1962, pp. 65-6) have defined creativity as follows:

Problem solving is called creative to the extent that one or more of the following conditions are satisfied:

1. The product of thinking has novelty and value (either for the thinker or for his/her culture).
2. The thinking is unconventional, in the sense that it requires modification or rejection of previously accepted ideas.
3. The thinking requires high motivation and persistence, taking place either over a
considerable span of time (continuously or intermittently) or at high intensity.

(4) The problem as initially posed was vague and ill-defined so that part of the task was to formulate the problem itself.

Nagasundaram and Bostrom (1993) and Gryskiewicz (1980; 1987) suggest that creativity occurs when new relationships between existing elements occur and/or when new elements are brought in. For example, cameras have experienced a lot of changes during the past few years. Today, we have compact, disposable, polaroid, digital and video cameras. The disposable camera has been developed by changing the relationships between existing elements. Instead of having a plastic case, disposable cameras have cardboard cases. The digital camera, however, has been developed by bringing in new elements, in the form of new technology. These cameras no longer use film to store pictures. Instead, memory cards or disks can be inserted into the camera. The images are captured and can then be easily transferred to a computer.

According to McFadzean (1998b), Couger (1995), Von Oech (1983) and de Bono (1992), creativity can be encouraged by changing a person’s mindset or paradigm. Kuhn (1970, p. 10) introduced the concept of the paradigm to the scientific world. He suggested that scientific paradigms are accepted examples of actual scientific practices, examples which include law, theory, application, and instrumentation together – that provide models from which spring particular coherent traditions of scientific research. Smith (1975) defines a paradigm as a shared set of assumptions, a way people perceive the world and a way of explaining what is going on round about them. Moreover, Smith suggests that if people are in the middle of a paradigm it is difficult for them to perceive the situation in any other way. Creative problem solving, however, can help people to modify or even change their paradigm (McFadzean, 1998b; de Bono, 1992).

McFadzean (1998b) and VanGundy (1988) suggest that paradigm changes can be made by using three different strategies, namely:
(1) association;
(2) stimulation; and
(3) expression.

The objective of brainstorming, for example, is to develop as many ideas as possible. According to Osborn (1957), this is because the quantity of ideas will ultimately yield quality. In other words, the more ideas generated, the more likely it is that the group will produce some good quality ideas. In addition, there should be no criticism during this phase. This is because a relaxed and judgement-free atmosphere encourages the flow of ideas which would be severely impeded if participants were allowed to convey their judgement on each idea (Majaro, 1988). The facilitator must also encourage the group to combine and improve their ideas. The participants should build on previous ideas – called piggybacking – and to look for ways of combining two or more ideas to generate a third idea not thought of previously. Piggybacking is a form of association. The participants can undertake piggybacking whenever they see fit. This is therefore free association.

The ideas developed during a brainstorming session are used to spark off new ideas. In other words, participants are stimulated by information that is related to the problem or situation (McFadzean, 1996). In addition, brainstorming and its derivatives (e.g. brainwriting and nominal group technique) utilise either verbal or written expression. This means that ideas are communicated by writing them down or speaking to the rest of the group. These types of techniques are shown graphically in Figure 1.

Figure 1 Paradigm preserving techniques

![Paradigm preserving techniques](source: Adapted from McFadzean (1998d))
McFadzean (1996) and Garfield et al. (1997) have shown that these techniques do not necessarily encourage participants to modify or change their paradigms. McFadzean (1996), however, has shown that by changing the methods of association, stimulation and expression, participants can be encouraged to challenge their paradigms. For example, object stimulation utilises forced association and unrelated stimuli. Here, participants are asked to describe objects. These descriptions are then used as unrelated stimuli to encourage the development of new and novel ideas. In other words, they are forcibly linked back to the problem. For instance, a company could use this technique to develop novel ideas for a new marketing strategy. The participants could choose a company outside their own industry sector and describe the marketing techniques that they think are successful. Participants from a supermarket, for example, could list the marketing strategies developed by other firms such as Virgin Airways, Disney World, BT, the Royal Bank of Scotland, etc. These strategies can then be linked back and developed so that they can fit in with the supermarket’s overall strategy. For example, supermarkets are now offering financial services, which were previously only offered by banks.

Object stimulation therefore encourages participants to stretch their given paradigm by utilising unrelated stimuli and forced association. This is shown in Figure 2.

Paradigms can be broken, however, by using unlimited methods of expression as well as unrelated stimuli and forced association. An example of a paradigm breaking technique is Rich Pictures (McFadzean, 1998a; McFadzean et al., 1998). Here, participants are asked to draw a picture of where they see the company in ten years’ time. They are then asked to draw a picture of how they see the company at the present time. Next, each participant describes the two pictures and gives reasons for why he/she has used these particular images to represent the company. The technique can draw out a lot of information that would not necessarily have been revealed using more conventional techniques. In addition, the participants can see instantaneously the differences between the picture of the future and the picture of the present. The stimuli developed from these pictures can then be linked back to the problem (see Figure 3). Paradigm breaking techniques can utilise other forms of expression such as visioning, role-playing, dancing, singing, story telling, etc.

Creative problem-solving techniques, therefore, lie on a continuum ranging from paradigm preserving to paradigm breaking (see Figure 4).

The creativity continuum can help team participants and facilitators to find a balance between creativity and comfort. For example, paradigm preserving techniques are useful for situations that do not require novel or innovative solutions. In addition, they are
useful techniques for teams who are inexperienced or less developed. This is because they do not necessarily require any imagination nor do they make the participants feel uncomfortable. Comfort is an important issue. McFadzean et al. (1999) found that participants who were uncomfortable with the meeting process were less effective during these sessions. In fact, some members may even refuse to participate at all. Smith and Berg (1995) also found that comfort was an important factor in team work. They used paradigm stretching techniques to help participants to understand functional and dysfunctional behaviour. For example, Smith and Berg (1995, p. 402) used one session to highlight the role of opposition and another to teach the team about group membership. In the latter session, the authors asked the participants to state the group memberships that they were speaking out of as well as the group membership(s) of those they were speaking to. The exercise allowed the groups to learn about group identity and membership but it also managed to highlight the participants’ emotions and frustrations. For instance, the opening comments started off fairly benign (Smith and Berg, 1995, pp. 402-3):

White female student to all other students, male and female, of all ethnic and racial backgrounds: I think doing this is going to be very hard.

Black male to white female: but it will be good for us. Some of us are forced to think of this every time we open our mouths, while some of you never have to think of it. Saying it will put us all on a level playing field.

Later, however, the participants started to use this method to voice their feelings as well as their own identity:

Group member getting very frustrated with what’s going on to those not pulling their weight: It is unfair that some of you are not risking anything.

Black female to the frustrated white male who is not identifying the real group memberships through which he is speaking: Please recognize that taking risks is a very different experience for some than for others . . . .

This teaching method is paradigm stretching because it is forcing the participants to view the problem from a different perspective. They have to undertake an exercise that does not come naturally to them although many of them will have attended meetings before. Unfortunately, people who have not been trained or are not experienced in these types of exercises find them uncomfortable and do not relish participating in them. In fact, Smith and Berg (1995) found the participants opposing these methods. In this case, they took their anger out on the facilitator.

Although the above was a training exercise, in reality an uncomfortable or frustrating session can be very destructive or ineffective. Smith and Berg used the paradigm stretching exercises to illustrate group functions and processes. However, during actual problem-solving sessions, group members may not tolerate such exercises. In such cases, the

Figure 4 The creativity continuum

<table>
<thead>
<tr>
<th>Problem Boundaries</th>
<th>PARADIGM PRESERVING</th>
<th>PARADIGM STRETCHING</th>
<th>PARADIGM BREAKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative Stimulation</td>
<td>Unchanged</td>
<td>Stretched</td>
<td>Broken</td>
</tr>
<tr>
<td>Stimuli</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Association</td>
<td>Related</td>
<td>Unrelated</td>
<td>Unrelated</td>
</tr>
<tr>
<td>Expression</td>
<td>Free</td>
<td>Forced</td>
<td>Forced</td>
</tr>
<tr>
<td>Examples of CPS Techniques</td>
<td>Verbal/Written</td>
<td>Verbal/Written</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Brainstorming</td>
<td>Object Stimulation</td>
<td>Wishful Thinking</td>
<td></td>
</tr>
<tr>
<td>Brainwriting</td>
<td>Metaphors</td>
<td>Rich Pictures</td>
<td></td>
</tr>
<tr>
<td>Force Field Analysis</td>
<td>Assumption Reversal</td>
<td>Picture Stimulation</td>
<td></td>
</tr>
<tr>
<td>Word Diamond</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from McFadzean (1999)
facilitator should only utilise paradigm preserving techniques. Likewise, an inexperienced facilitator should not use paradigm stretching or paradigm breaking techniques. In fact, Smith and Berg (1995, p. 412) make a comment about their teaching methods: “the methods described in this article raise questions about the safety and psychological security of the group members”. Thus, it should only be highly trained facilitators who should utilise paradigm stretching and paradigm breaking exercises during their sessions.

**Paradigm preserving techniques**

There are many different types of paradigm preserving techniques including brainstorming, brainwriting, hexagons, 5W + H, force field analysis, etc. (McFadzean, 1998a). One such method was devised by VanGundy (1992) and is called Word Diamond. The instructions are as follows:

1. The group participants choose four words or phrases from the problem statement.
2. These words can then be placed in a diamond shape so that each word or phrase lies at one of the points.
3. The group participants are asked to combine the words or phrases together and to tell the facilitator the ideas that have occurred due to the combination. The facilitator writes the ideas down on a flip chart.
4. Next, the two words, which were initially selected, are combined with a third word to develop more ideas.
5. Steps 3 and 4 are repeated until all possible combinations are examined and all the ideas have been recorded.

The exercise has been illustrated in McFadzean (1998a, p. 35). The problem statement is written down on a flip chart – “In what way can we motivate our employees to think creatively?” A word diamond is then developed using four words from this statement, namely motivation, employees, think and creative (see Figure 5). The words are then combined to produce ideas. For example:

- **Motivate – creative**: train employees in how to think more creatively.
- **Employees – creative**: encourage the use of creative problem-solving techniques during meetings.

The group continues to combine words and record ideas until they have exhausted all possibilities. These ideas can then be analysed and developed into workable solutions.

Techniques like this one do not require the use of extensive imagination. The ideas are developed using related stimuli and by combining words and ideas. Free association is used to develop ideas for each word combination. These techniques are not uncomfortable to use and, therefore, they can be utilised by less experienced groups and facilitators.

**Paradigm stretching techniques**

Paradigm stretching techniques use forced association and unrelated stimuli in order to encourage participants to develop creative ideas. These techniques include object stimulation, metaphors, rolestorming, heuristic ideation technique, assumption reversal, etc. (McFadzean, 1998a, pp. 50-1). Assumption reversal, for example, provides the participants with a new perspective by reversing the assumptions that have been made about the problem or situation. For instance, by using the technique of assumption reversal, a number of novel ideas can be developed regarding the following problem statement:

In what way might we improve information technology?

The instructions for assumption reversal are:

1. Write down the problem statement.
(2) List all the assumptions that can be made regarding the problem or situation.
(3) Reverse each of the assumptions. Do not worry if they seem to be odd or silly.
(4) Use these assumption reversals to stimulate new ideas regarding the problem or situation.

The above problem, therefore, includes the following assumptions:
(1) Computers help us communicate with the outside world.
(2) A computer requires electricity to operate.
(3) My computer allows me to produce memos and letters more efficiently.

These assumptions can then be reversed to give the following:
(1) Computers can help us communicate with ourselves.
(2) Computers do not require electricity to run.
(3) My computer can produce the memos and letters by itself.

From these assumption reversals, a number of novel ideas can be produced. For example:
(1) Develop “friendly” computers that we can talk to and which can help us think through our problems or to remind us to do things.
(2) Build a solar powered or clockwork computer.
(3) Construct a computer that is able to produce letters and memos by itself. For example, the user can ask the computer to write (and send) a letter to his/her bank manager asking him or her for a £5,000 loan.

Paradigm stretching techniques have several strengths and weaknesses. The main advantage of these exercises is that they generally encourage participants to develop more creative ideas than they would develop when utilising paradigm preserving techniques. Second, these exercises are not as intrusive or as uncomfortable as the paradigm breaking techniques. There is, however, a need to be aware of the safety and psychological security of the participants. If the facilitator and/or the team participants ignore the discomfort that may be produced by utilising these techniques, then the group may show negative emotions such as aggression, anger and frustration. In fact, Lieberman et al. (1973) found that the instance of psychiatric casualty increased if leaders tended to confront participants in a dominating manner in order to stimulate them. According to Smith and Berg (1995, p. 412):

Risks that open up the possibility of learning are best done in a setting in which the individual feels that the invitation to explore other ways of being are based on compassion and caring and not on assault, belittlement, or unwanted intrusion, even though it may sometimes feel this way. The environment must also be one where the facilitator supports group members in maintaining the integrity of their individual boundaries.

It is therefore very important that the facilitator or team leader has experience in running sessions using paradigm stretching techniques. In addition, the group members themselves should be experienced in “people” related issues. Psychological safety can be increased by developing and training groups that are aware of the participants’ roles and responsibilities and the dynamics of the team. Those groups who are only attentive to the task and the meeting structure should only use paradigm preserving techniques (McFadzean, 1998c).

Compassion, caring and safety all occur by developing and enhancing relationships and trust. Groups must therefore be taught about the behaviour and dynamics of teams (Francis and Young, 1992). Moreover, dysfunctional behaviour must be discouraged and positive, effective behaviour must be enhanced. Facilitators must also be developed so that they will be able to teach groups about effective behaviour and intervene at appropriate times in order to discourage dysfunctional actions. In addition, groups will also develop their relationships by spending time together (Katzenbach and Smith, 1993). Hunter et al. (1995, p. 49-51) suggest that in order to develop effective team members, each participant must:

• Get to know the other people. A friendly interest in other members helps to build a climate of trust and openness in the group.
• Be clear about the group purpose, values, ground rules and practices. Also be clear about commitments in time and energy and the limits of involvement.
• Contribute to discussions, group decision making and task allocation.
• Share thoughts, ideas, feelings and concerns. This adds to the richness of the group.
• Listen generously to other people. Remember that each person should be committed to the group purpose, even if his/her baggage is getting in the way.
• Speak concisely and to the point.
• Maintain focus and ensure that the process will lead to the fulfilment of the meeting’s goals.
• Be proactive. Make suggestions, propose alternatives, look at what’s missing in the discussion and add it.
• Be flexible. Avoid taking a fixed position. Remember there is no one right way. Be prepared to negotiate.
• Ensure that you understand the conversation that you are contributing to.
• Do not avoid conflict. Disagreement and conflict are an important part of the development of the group. See conflict as a way through to a more useful solution.
• Keep to the ground rules and encourage others to keep to them as well. If the ground rules are not working, initiate a discussion to remind the group, or if needed, revise the ground rules.
• Fulfil the commitments that have been promised in the appropriate time frame.

Paradigm breaking techniques
Paradigm breaking techniques can be more uncomfortable than either paradigm preserving or paradigm stretching procedures. The results for these exercises, however, can be very powerful. The ideas that are developed tend to be much more novel and creative than those developed using paradigm preserving or paradigm stretching techniques. Psychological safety, however, is very important. It is therefore imperative that paradigm breaking techniques should be undertaken in appropriate conditions. For example, McFadzean et al. (1999) found that process congruence is very important to the success of a paradigm breaking session. Participants who do not agree to the process are unlikely to take part effectively. Indeed, they may not take part at all.

One of the main complaints often heard when using these techniques is that the group members are there to work not to play or have fun. In fact, creativity can be greatly enhanced by encouraging the use of fun and playfulness. Ruggiero (1991, pp. 39-40) argues:

Unlike most people, creative people do not allow their minds to become passive, accepting, unquestioning. They manage to keep their curiosity burning, or at least to rekindle it. One aspect of this intellectual dynamism is playfulness. Like little children with building blocks, creative people love to toy with ideas, arranging them in new combinations, looking at them from different perspectives.

Both Isaac Newton and Albert Einstein believed that playfulness was an essential element to creativity. In fact, Einstein believed playfulness to be the essential feature in productive thinking (Gordon, 1961).

Humour can also stimulate group members to develop creative ideas. Hemsath and Yerkes (1997, p. 98) suggest that, “Fun can be a catalyst for an effective meeting. Used appropriately, fun and humor can relieve meeting tedium and level the hierarchical playing field to create an atmosphere that encourages honest dialogue, risk taking, and the sharing of ideas”. Many organisations use fun and humour to motivate their staff. For example, Alltel Corporate Services put on a skit that highlights all their organisational issues, including the company’s objectives, for the upcoming year. The Liberty Toy Company has found that their meetings are more effective if they start with an icebreaker. They allow their staff to play with some of their toys; the most popular being the toy guns and darts (Hemsath and Yerkes, 1997).

In fact, icebreakers and energisers are exercises that not only can help to stimulate the group’s imaginative and creative skills but also can help the team to develop and become more cohesive. There are numerous techniques that can help energise a group (McFadzean, 1998a; Roberts-Phelps and McDougall, 1997; Williams, 1993). For example, McFadzean (1998a, p. 70) suggests that an exercise called “truth/untruth” can help to energise the group as well as to encourage creativity, communication and group development. The instructions for this exercise are as follows:

(1) Break the group into syndicates of about two to four people.
(2) Ask each person to think up a true statement about themselves: the more obscure the better. In addition, they should also think up a statement which is not true (but could be). For example: I have sung a duet with Michael Jackson.
and I have climbed every Munro (a hill over 3,000 feet) in Scotland.

(3) Invite one person to announce his/her two statements. The other members of the group have to guess which one is true and which one is untrue. The person can then explain his/her statement, if necessary. For example, I have sung a duet with Michael Jackson (or at least I have sung along with his CD), I have not climbed every Munro in Scotland.

(4) Repeat this process for about ten minutes.

This exercise can be fun and it is amazing the revelations that can be made by participants. It is also a method of getting to know the other members of the group. The statements made, however, should be kept confidential because some of the true statements may prove embarrassing to the members who revealed them.

Paradigm breaking techniques help participants to overcome long-standing patterns of thinking and to view situations from different angles (Alder, 1993, p. 58; McFadzean, 1998b). One method of achieving this is to think visually instead of in words or numbers. According to LeBoeuf (1994, p. 56):

A common technique of creative people is to block out all verbal thoughts and concentrate on forming mental pictures of the subject or problem. For example, Frederich von Kekule’s discovery that benzene and other organic molecules are closed chains or rings was a result of a dream in which he saw snakes swallowing their tails.

There are a number of techniques that can encourage group members to think visually. These include rich pictures, picture stimulation and collages (McFadzean, 1998a; McFadzean et al., 1998). For example, Morgan (1997) uses the spider plant as a metaphor for the characteristics of an organisation. He has found that this method has helped groups to stimulate their creative thinking. For instance, the following are four key ideas that have emerged when he used this technique:

(1) The plant pot acts as a constraint to the plant, stopping it from growing to its fullest potential. The plant pot signifies the central office of an organisation. Therefore, the constraints set by the “plant pot” must be broken.

(2) Spider plants can produce numerous “babies”. These are smaller plants attached by stems to the mother plant. These stems are the new spider plants’ lifelines because they receive their nourishment from the mother plant. In an organisation, decentralised departments will also depend on their lifelines for nourishment. Morgan (1997, p. 74) suggests that:

Many [organisations] are struggling with processes of decentralisation or of spawning new entrepreneurial initiatives. They desperately want to create more flexible, innovative units, but they get hamstrung by traditional patterns of thinking about control and accountability. As a result, the new units get enmeshed in report-writing and rule-following requirements and other hierarchical requirements that make them extensions of the central bureaucracy. Yet, if those in the central bureaucratic “pot” could think in terms of “umbilical cords”, like those of a spider plant, they’d have a means of reconciling the contradictory demands of creating decentralisation while sustaining control and accountability.

(3) Organisations need to develop different “cords” for managing different situations. For example, different cords, or business units, could have different organisational structures.

(4) Encourage “bumblebees” so that there is integration between the cords and a coordination of systems and budgets.

Morgan has therefore used a pictorial metaphor to represent an organisation. This method encourages participants to break away from traditional ways of thinking and helps them to view the problem from a number of different perspectives. Thus, paradigm breaking techniques encourage creative thinking by using different forms of expression such as drawing, visioning and role-playing, as well as using forced association and unrelated stimuli.

Implications

The creativity continuum presents a number of implications for managers. Perhaps the two most important implications are those of training and culture. Employees need to be trained in creative thinking, team management and group participation, and organisations must develop their culture in such a way as to nurture and support

More and more creativity is happening collectively. The reason is that collective creativity works. Brainstorming is hard to do alone but is increasingly important in business where creativity is a source of competitive advantage – and not many businesses can say creativity is not important. Indeed today, as technology, the economy, and what we know and need to know get increasingly complex, work can only benefit from teams of minds untangling problems and forging solutions . . . . The greatest scientific breakthroughs of our times have come from aggregated effort, but collective creativity makes sense even in more routine business situations. [For example, drug development] requires the best ideas of biologists, chemists, geneticists, and clinicians, whose insights don’t just synthesize but combine and combust to create solutions none of the scientists could have come up with alone. In other words, in today’s environment collective creativity is fast becoming a competitive imperative.

Creativity is therefore very important for organisations. Thus, it is vital for senior management to provide and encourage a creative climate (Evans, 1993; Coopey, 1987). Anderson et al. (1992) have suggested four factors that consistently surface as key determinants of group innovativeness. These are:

1. Vision;
2. Participative safety;
3. A climate for excellence; and
4. Support for innovation.

Visioning is very important because it can help creative thinkers to break their paradigms and think of a more powerful future. In addition, participative safety is paramount. Employees can only be encouraged to think creatively if they are not afraid of criticism or punishment (McFadzean, 1998b). Creative ideas also need to be implemented effectively if they are to succeed. This is best achieved in a climate of excellence where managers are committed to achieving a first-rate performance. Finally, senior management must support and encourage a climate for creativity. Often managers will articulate their support but will not enact it.

Evans (1993) has also suggested that the following actions will prove beneficial for a creative culture. The company should:

- Encourage employees to express their ideas openly.
- Provide time for individual efforts.
- Encourage risk taking and initiative.
- Provide freedom for the employees to enable them to do things differently.
- Provide a non-punitive environment using a low level of supervision.
- Encourage employees to interact and participate with other work groups besides their own.
- Maintain an optimal amount of work pressure.
- Provide realistic work goals.
- Encourage the delegation of responsibilities.
- Demonstrate confidence in the workforce in a climate of mutual respect.
- Allow individuals to be part of the decision-making process.
- Encourage management to provide immediate and timely feedback to their team members.

Training is also an important factor in developing a creative climate (Hicks, 1991). Robinson and Stern (1997) claim that the majority of creative acts are unplanned but this does not mean that organisations should not proactively develop their employees to think more creatively and to work more effectively together. Creativity training is important but it must be integrated with other people-related skills such as communication, teambuilding, leadership, etc. (Carr, 1994). In addition, there should be an expectation that, having attended a course, the participant should apply his/her new knowledge to his/her own job. Carr (1994, p. 120) suggests that creativity training should be provided “but first make sure that those who receive it will have the opportunity to apply it when they finish their training”.

The creativity continuum provides a useful framework for developing training courses. Participants can then be made aware of the differences between the varying types of creative problem-solving techniques. In addition, they can be taught how to use them, the types of groups that would benefit from them and each technique’s strengths and weaknesses. These techniques should not only be taught to potential group participants but also to facilitators since it takes different skills to support teams undertaking paradigm preserving techniques from those of teams,
for example, who are undertaking paradigm breaking techniques.

Moreover, because paradigm stretching and paradigm breaking techniques require more developed and experienced teams to utilise them effectively, training in team building and group dynamics is also necessary (McFadzean, 1998c). This will help participants to undertake the process more effectively by reducing dysfunctional behaviour and encouraging a more positive and effective performance.

Summary

Creativity is vital for organisations that want to develop new and novel ideas for problem solving, opportunity finding, innovation and change. This paper has explored creative problem solving in groups and has presented a framework entitled the creativity continuum. This continuum has divided creativity techniques into three categories: (1) paradigm preserving; (2) paradigm stretching; and (3) paradigm breaking.

Each type of technique has merit and all are useful for organisations. Paradigm preserving techniques, for instance, do not necessarily encourage participants to be creative but they are valuable techniques for less developed and inexperienced groups. Conversely, paradigm breaking techniques can encourage participants to think very creatively but they should only be used by experienced facilitators and teams. In order to utilise these techniques effectively, organisations must develop a culture that will encourage imaginative thinking and provide a safe environment for taking risks and undertaking challenges. Moreover, teams and facilitators should be actively developed and taught the benefits of creative problem solving in groups.

References


Hemsath, D. and Yerkes, L. (1997), 301 Ways to Have Fun at Work, Barrett-Koehler, San Francisco, CA.
McFadzean, E.S. (1999), "Creativity in MS/OR: choosing the appropriate technique", Interfaces, Vol. 29 No. 5, pp. 110-22.


Williams, R.B. (1993), More than 50 Ways to Build Team Consensus, IRI/Skylight Training and Publishing Inc., Palatine, IL.