



**Creatin**

Leonardo Da Vinci

ES/08/LLP-LdV/TOI/149007

---

## CREATIN Methodological Framework

---

**Circulation:** Confidential  
**Partners:** innovate  
**Authors:** Dr, Kathryn Cormican, innovate  
**Date:** 24<sup>th</sup> March, 2009  
**Doc. Ref. N°:** CREATIN-WP2-Report-24032009

**COPYRIGHT**

© Copyright 2008 The CREATIN Consortium

Consisting of :

- Fundación para el desarrollo de la ciencia y la tecnología en Extremadura (FUNDECYT)
- Innovate
- Funditec
- First Elements Euroconsultants LTD
- Stichting Bussiness Development Friesland
- Xlab
- National Association of small and médium-Sized Business
- Fundación Centro Tecnológico Industrial de Extremadura
- Fundación Maimona

This document may not be copied, reproduced, or modified in whole or in part for any purpose without written permission from the CREATIN Consortium. In addition an acknowledgement of the authors of the document and all applicable portions of the copyright notice must be clearly referenced.

All rights reserved.

This document may change without notice.

**DOCUMENT HISTORY**

<b>Version</b>	<b>Date</b>	<b>Comment</b>
01	4 <sup>th</sup> March, 2009	First issue
02	24 <sup>th</sup> March, 2009	Second Issue
03		
04		

**EXECUTIVE SUMMARY**

Companies of all sizes increasingly recognise that ideas are their most precious commodity and employees who produce them are sought-after resources. They understand that competitive advantage depends heavily on their ability to capitalise on employees' ideas and unleash creativity within their working environments. Creativity must be effectively managed if improvement efforts are to succeed and businesses are to remain competitive.

The Creatin project aims to improve the creative capacity of European SME's. The aim of this document is to present the research methodology to be used in the Creatin project. The background and context of the research to be undertaken is defined from the outset. Here, some key issues relating to creativity is presented and discussed. Next the research strategy or the approach to be taken in the Creatin project is introduced. Subsequently, the research methodology is presented in detail.

---

**TABLE OF CONTENTS**

<i>Chapter</i>	<i>Contents</i>	<i>Page</i>
<b>1</b>	<b>INTRODUCTION</b>	5
<b>2</b>	<b>UNDERSTANDING CREATIVITY</b>	6
2.1	Defining Creativity	7
2.2	Types of Creativity	8
2.3	The Creative Process	8
2.4	Sources of Creativity	10
<b>3</b>	<b>RESEARCH STRATEGY</b>	11
<b>4</b>	<b>RESEARCH METHODOLOGY</b>	12
4.1	Define Scope	13
4.2	Understand Key Success Factors and Problems	14
4.2.1	<i>Findings from Workshop and Literature Synthesis</i>	14
4.3	Develop Tools	16
4.4	Test Tools	18
<b>5</b>	<b>CONCLUSIONS</b>	20
<b>6</b>	<b>REFERENCES</b>	21
<b>7</b>	<b>BIBLIOGRAPHY</b>	24

---

## 1 INTRODUCTION

According to Gupta and Singhal (1993) successful organisations create competitive advantage through innovation and creativity. In today's marketplace organisations' emphasis is changing from visible assets (such as equipment or technology) to invisible assets (like creativity and capability). Companies of all sizes increasingly recognise that ideas are their most precious commodity and employees who produce them are sought-after resources. Competitive advantage depends heavily on their ability to capitalise on employees' ideas and unleash creativity within their working environments. An organisations success is often measured by the annual profits, level of sales and/or position adjacent to competitors. Without a product to market an organisations position becomes untenable. Products stem from innovation, which in turn stems from creativity. People drive creativity and creativity drives innovation. Therefore enhancing the creative output of individuals involved in an innovative working environment will increase the level of innovation. The proficiency within an organisation to effectively encourage creativity within innovation does not diminish over time, but instead grows in importance for organisational success. Consequently, organisations must adopt proactive practices in order to mobilise creativity within their working environments.

The Creatin project aims to improve the capacity of European SME's to implement effective initiatives. To do this, the team aims to identify and prioritise the key barriers that currently exist in relation to creativity in European SMEs. By analyzing an organisation's activities and by quantifying the impacts of these activities the organisation can respond in a planned and co-ordinated way. Defining clear goals and objectives in relation to creativity provides direction to the organisation.

The aim of this document is to present the research methodology to be used in the Creatin project. The report aims to facilitate the understanding of creativity in the work place. To do this the key concepts of creativity are presented and discussed. The background and context of the research to be undertaken in the Creatin project is then elaborated. Next the research strategy or the approach to be taken in the Creatin project is introduced. Subsequently, the research methodology is presented in detail. The key stages in the methodology include:

- Define scope. Describe and agree the aims and objectives of the research as well as the target audience.
- Understand key success factors and problems. Here findings from an initial workshop hosted by innovate are presented and discussed.
- Develop tools. A creativity scorecard is created based on our initial workshop findings and initial literature survey.
- Test tools. Verify and evaluate the nature and sequence of the Creativity Management scorecard. This will be achieved through an open workshop facilitated by innovate.

---

## 2 UNDERSTANDING CREATIVITY

This chapter attempts to synthesise the relevant literature on creativity. It explores the dynamics of organisational creativity. Specifically, it discusses creativity in relation to innovation, definitions of creativity, types of creativity, the creative process and the sources of creativity.

### 2.1 Creativity and Innovation

The innovation process begins with an idea generation or problem recognition stage (Farr et al., 1990), which is where creativity primarily occurs. Ettlie (2000) describes a creative idea as the '*germ*' of an innovation but differentiates creativity from innovation by highlighting that it is the innovative process, which is the means by which the creative idea is developed and exploited. Thus the organisation that neglects the importance of creativity, risks a future of no new products or process improvements and will possibly depend on buying in the methods of others.

Rosenfeld and Servo (1991) state that "*creativity is the starting point of any innovation*" but emphasise that creativity is an individual and solitary cognitive process, whilst innovation is a more inclusive social process involving many people (West et al., 1990). It is satisfying this essential difference in the two that often leads to difficulties within an organisation. There is often a freedom or sense of chaos that enhances a creative working environment, however this is not often appropriate for a mainstream product development scenario. Creativity is associated with that part of the innovation process, which is labelled as '*idea generation*'. This approach is consistent with the definition of Heap (1989), who defined creativity as: "*the synthesis of new ideas and concepts...where innovation is the implementation of creativity*". Also Titus (2000) has defined creativity as "*the birth of imaginative new ideas*".

There have been several recent reviews of the literature, which help to describe and theorise understandings of the nature of creativity. A key issue in discussing and defining creativity is whether the focus is upon exceptional creative individuals, such as Albert Einstein or Charlie Parker, who shift paradigms in society's ways of knowing, or upon all individuals and their potential for self-actualisation through 'little c creativity' or 'possibility thinking' supporting people in making choices in everyday life (Craft 2000). It is this broader view of promoting creativity in all individuals, which underpins this thesis. Creativity is about originality that leads to new ways of seeing novel ideas while innovation is the practical application of such ideas (Amabile 1983; Cunnane, 1994). The dependency of innovation on creativity is emphasised by Cumming (1999) who claims that the level of idea generation within an organisation is related to the level of creativity within its human resources. Engrained in the process of idea generation, creativity and innovation exists the concept of knowledge creation see figure one below. It is part of the creativity process and a valuable asset contained within an organisation's human resources.

Tidd et al. (1997) stress that knowledge is a crucial element of creativity and affects areas of the creative process such as idea generation, determination of future vision and project management. New knowledge is created within an organisation by converting between the tacit, explicit and cultural knowledge. Macey-Bruges (2001) states the 'essence' of creativity lies in establishing new connections. Thus, through the sharing of tacit and explicit knowledge with other knowledge workers, creativity can be enhanced. Woodman et al. (1993) argue that creativity refers to '*the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system.*' King et al., (1990) proposed that creativity at the team level explicitly

---

incorporates the interpersonal discussion among team members. Building on Woodman et al. (1993) and King et al., (1990) product development requires both the generation of new knowledge and solutions and novel combinations of existing knowledge and solutions.

As knowledge is now the currency for economic growth and productivity, an organisation in today's knowledge based economy, has to focus on managing and enhancing its biggest asset: the knowledge capital of their employees, in such a way, that communication is fostered, knowledge is shared, creativity is enhanced, innovation is supported and competitive advantage is achieved. Successful organisations are those that consistently create new knowledge, disseminate it widely throughout the organisation and rapidly include it in new products. These characteristics define the "knowledge-creating" organisation, whose sole business is continuous innovation. Thus, the key to success in the knowledge sharing is to build the intellectual capital that will create the necessary core skill-sets and products that will lead to competitive advantage.

## 2.2 Defining Creativity

Amabile (1988) views creativity as "*the production of novel and useful ideas by an individual or small group of individuals working together*", where the idea is "*appropriate, useful and actionable*". Farid (2007) claims that creativity is that which "results in the generation of new and useful ideas or the combination of existing ideas into new and useful concepts to satisfy a need". Creativity has frequently been likened to a mysterious and powerful process owned by a select and fortunate few. Some have proposed that it is a direct gift from God. Meanwhile, the romantic notion argues that creative individuals own extraordinary personality characteristics and are thus capable of mysterious thought processes. "*Creativity is a combination of flexibility, originality and sensitivity to ideas which enables the thinker to break away from the usual sequence of thought, into different and productive sequences, the result of which gives satisfaction to himself and possibly others*" (Jones, 1972).

However, a creative product is the result of the ordinary thought processes of ordinary individuals. Creativity becomes extraordinary only on the basis of what the individual produces. Edward De Bono (de Bono 1981) maintains that the logical use of the mind excels at developing existing ideas but is not so effective at generating new and novel ideas. There is no standard method for determining what is creative work, just as no standard technique exists for introducing creativity, although creativity tools and techniques are employed to support the initial stages of the creative process i.e. mind maps, cause and effect, brainstorming, Affinity.

Creativity can be defined according to characteristics of the individual, which include trait theories and approaches. Creativity can be seen as a personality variable, which is located on a continuum between innovators and adapters (Cormican 2003). Innovators are those who do things better and adapters are those who think differently. This distinction refers to the style, and not the level, of creativity and at best, it can only indicate which individuals are most likely to produce creative ideas.

Creativity can also be defined according to the process. Henry (2007) states that, "*it is a thinking process associated with imagination, insight, invention, ingenuity, intuition, inspiration and illumination.*" Woodman et al (1993) frame the definition of organisational creativity as a subset of the broader domain of innovation.

---

In addition, creativity can also be defined in accordance with product Amabile (Amabile, 1998) has conducted extensive research on the subject and defines creativity "*in business originality is not enough. To be creative, an idea must also be appropriate, useful and actionable*". Amabile (Amabile, 1998) has defined three components of creativity; creative-thinking skills, expertise and motivation. Managers can influence these components through workplace practices and conditions.

Individual creativity and organisational innovation are closely linked. However, creativity is an individual cognitive process in which events occur within the person, innovation is a social process with the elements of the process being events that occur between people (Cormican, 2003).

If we look back through history, the industrial age was full of techniques, which more often than not marginalised rather than maximised people's creative potential. By necessity, nevertheless, organisations recognised that they must reduce bureaucracy and create cultures in which employees stretch their imaginations, share their ideas and are given greater autonomy. Those organisations that really understand human creativity and are committed to nurture it and live with the consequences of doing so are the ones most likely to succeed. People have a capacity to innovate, re-frame their perceptions, solve problems and express themselves and what they know far beyond what most of them believe to be true of themselves. To think creatively is a learned skill and atrophies when it is not practiced.

### 2.3 Types of Creativity

Individual creativity mechanisms refer to activities undertaken by individual employees within an organisation to enhance their capability for developing something, which is meaningful and novel within their work environment. Organisational creativity mechanisms refer to the extent to which the organisation has instituted formal approaches and tools, and provided resources to encourage meaningfully novel behaviours within the organisation. The literature on innovation and creativity that focuses on the role of individuals in creating innovations has examined factors such as intelligence, motivation to innovate, and creativity skills (Amabile 1997), (Sternberg et al. 1997).

The process-orientation approach views intelligence as an innate attribute, and suggests that the latter two factors can be influenced by external factors. Amabile (Amabile 1988) argues that innovation in an organisation is significantly influenced by the extent of creativity-relevant skills possessed by its employees. These creativity-relevant skills can be developed, sustained, and enhanced through formal and informal mechanisms such as training and education (Amabile 1988). Aside from these skills, individuals need to put at risk the desire to appear consistent, comfortable, confident and competent (the 4Cs) to improvise and be innovative. Workshops and training programs are effective mechanisms to develop "a perspective or orientation that enables one to risk the 4Cs.". Hence, the preceding discussion suggests that when employees improve their creative abilities, it enhances the innovation performance of a firm.

### 2.4 The Creative Process

A creative output is the result of the natural thought processes of ordinary individuals. Creativity only becomes extraordinary on the basis of what the individual produces. Two conflicting views concerning creativity 'seeds' include the genius view and the behaviourist view. The former refers to creativity as being that which enables the owner to find

---

significance in the irrelevant and to find meaning from contradictions. The latter perspective argues that creative responses are the result of one of two processes;

- A new situation contains elements similar to those of an old situation, thus these elements serve as the basis for generalising the old response to the new situation.
- If the new situation is completely dissimilar to previous situations, then the solution is to behave randomly by combining various responses in numerous ways.

Kao (1989) views the creative process of an individual as consisting of six phases. According to Kao (1989), the initial phase of the creativity process is 'interest', where an individual's intuition or emotion leads them to scan their environment for opportunities or solutions. The second stage of the process is 'preparation', where planning is undertaken to "prepare for the expedition". Following this stage, the process enters the 'incubation' phase, where the individual utilises his intuition to "mull things over". This stage can be of indefinite duration and is often enhanced by outside influences and communication. The successful end of the 'incubation' phase is denoted by the 'illumination' phase, where the idea or solution finally 'comes together' from the intuition of the individual in "the 'eureka' experience". The next stage of the creative process is that of 'verification', where the individual rationally validates his creative output relative to the desired output. In the event that there are irregularities, the individual may return to earlier stages of the process for rework based on the new knowledge gained. In the event that the output is deemed positive, the 'exploitation' phase of Kao's model begins where the individual or organisation rationally try to "capture value from the creative act".

None of that would be possible without the brain. The brain has been described as one of the most complex things we have yet discovered in our universe. In 1981 Roger Perry's proposal of the split-brain theory, showed that the brain has two hemi-spheres, each having different but overlapping functions and the right and left cerebral hemi-spheres specialise in different types of thinking processes. Psychologists conclude that although the creative capacity of the brain is limitless, the only boundaries restricting its expression are those erected by our own selves. In creative problem solving, both cerebral hemi-spheres are typically employed in the following fashion.

- Left: Define the problem in a logical manner.
- Right: Generate creative alternative.
- Left: Critically evaluate the alternatives.
- Right: Define a proposal for the selected approach implementation.

Creative actions are assumed to occur thought incubation within the unconscious mind. Following incubation, the conscious mind is presented with the creative ideas, which the user puts into action.

---

## 2.5 Sources of Creativity and Innovation

The sources of creativity and innovation are often classified as arising from “technology push” or “market pull”. In the case of the technology push (or technology driven) model, product development ideas are produced by the R&D department of an organisation. A prototype is then created and the resulting product manufactured, marketed and sold. According to this model, the market place passively receives whatever is offered by the organisation (Trott, 1998). The customer driven or market pull model of innovation views the innovation process from a different angle. In this model, the new ideas are presented to the organisation from the external environment e.g. Marketing reports on customer wants, needs and expectations. These ideas for new product development are then transferred to R&D and design for development and finally to the manufacturing department for production.

In reality the sources of innovation are much more varied than either of these two models portray. Ideas for new product development may occur as a result of a combination of influences from within or outside the organisation. The interactive model of innovation

Stevens and Burley's 90% of raw ideas actually never advanced beyond the idea generator's desk-top. The remaining 10% of ideas that succeeded in advancing beyond the drawing board to the small project stage. Of these, only 3% obtained the backing to develop into significant projects, less than 2% became major development efforts, less than 1% were ever launched commercially, and only 0.3% achieved commercial success. Thus, approximately 3000 raw innovative ideas were required to yield one commercially successful new product.

---

### 3 RESEARCH STRATEGY

Research strategy refers to the particular approach chosen by the researcher to undertake research (Yin, 2002). Following on from this, specific research designs and data collection methods can be formulated. Such research methods are determined not only by the type of research to be investigated but also the required outcome (Grønhaug and Olson, 1999). Creswell (2003) describes three different approaches to data collection and analysis namely quantitative, qualitative and mixed methods. The quantitative approach is one in which the researcher uses to "*measures in which numbers are used directly to represent the properties of something*" to develop knowledge (Hair et al, 2003). The strategies employed include experiments and surveys where data is collected on instruments that produce statistical data. With the qualitative approach the researcher uses socially constructed meanings with the intent of developing a theory (Lee, 1999; Kaplan and Maxwell, 1994). Some of the strategies of enquiry that are used include words, pictures and ethnographies where the researcher collects open-ended data without assigning numbers directly. Qualitative analysis helps researchers to understand and explain why people have different experiences. The mixed methods approach is one in which the researcher bases knowledge claims on pragmatic groups (Hair et al, 2003; Lee, 1999). In this case, a problem is identified for which there may be a range of possible solutions and the most advantageous must be determined. The mixed methods approach adopts strategies of enquiry that involve the collection of data in order to understand the situation that exists. Here data collection involves capturing numeric as well as textual information. In other words, both quantitative and qualitative methods are employed.

In this case, the Creatin project consortium must define and prioritise the key problems with creativity initiatives in European SMEs. There may be a range of possible solutions and the most accurate and appropriate must be defined and developed further. The next section details the research methodology that will be used in the Creatin project.

## 4 RESEARCH METHODOLOGY

By following a structured approach to research, the project team increases the likelihood of success. If an established methodology is in place from the outset the data collection and analysis can happen quickly and predictably. The goal of the research methodology is to identify and integrate the most valuable and successful ways to define, target and capture the relevant information required. It ensures that the project team is focused on what it needs to deliver. An IDEF0 model is used to illustrate the Creatin methodology. IDEF0 was developed to enhance communication by using diagrams based on simple box and arrow graphics. Activities are described in terms of their inputs, outputs, controls and mechanisms. Controls are the enabling inputs to an activity. They are the reason for the activity to take place. Inputs are consumed by the activity and they together with controls are used to create outputs. Mechanisms are used by the activity to transform inputs and controls into outputs. This helps the user to identify what activities are performed in an organisation, and what is needed to perform those activities.

The research methodology used in the Creatin project synthesises best practice and brings together a number of support tools. It comprises of four key stages: (a) define scope; (b) understand key success factors and problems; (c) develop tools and finally (d) test tools. Each of these stages is briefly outlined in figure 1 and is discussed in more detail below.

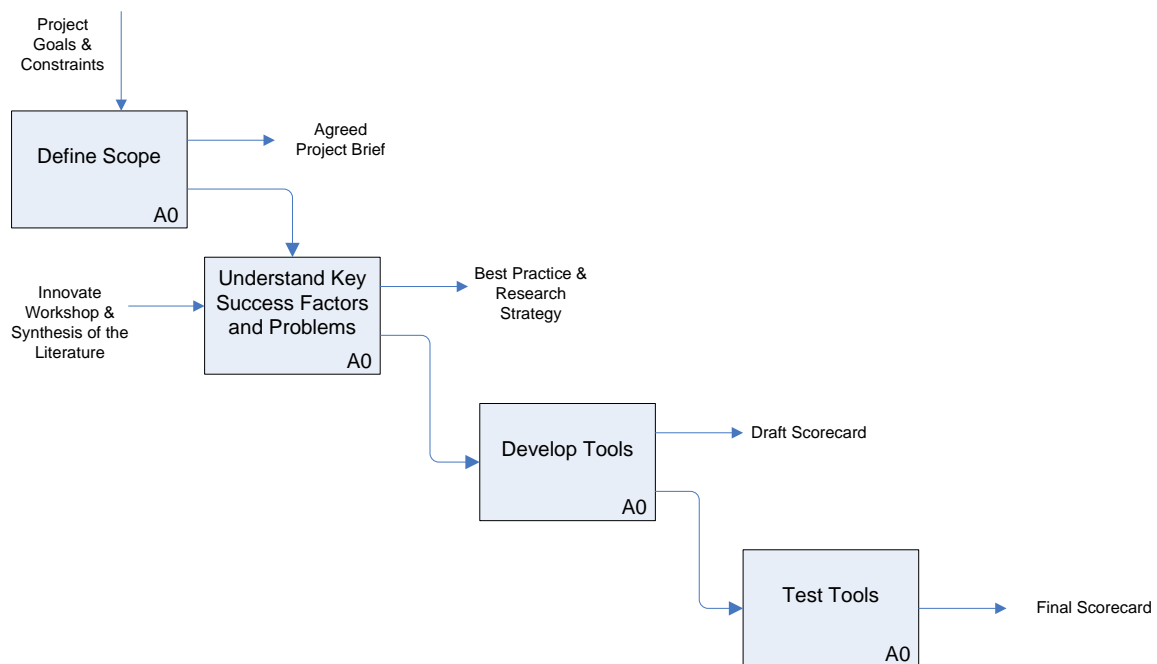


Figure 1: Creatin research methodology

#### 4.1 DEFINE SCOPE

This stage of the methodology ensures that the Creatin project team has a clear view, image or vision of who the project is targeting. The scope of the study is primarily defined by mutual consensus at the kick off meeting. The scope of the Creatin study is as follows:

Table 2: Scope of the Creatin project

Category	Description
<b>Goal</b>	<ul style="list-style-type: none"> <li>▪ To improve awareness of creativity</li> <li>▪ To make creativity common practice in European SMEs</li> <li>▪ To optimise knowledge, competencies and skills relating to creativity in European SMEs</li> <li>▪ To help companies to operate faster, cheaper, smarter and better</li> </ul>
<b>Aim</b>	<ul style="list-style-type: none"> <li>▪ To identify level of awareness and understanding in relation to creativity</li> <li>▪ To determine if strategies and policies for creativity are defined and implemented</li> <li>▪ To determine if creativity is encouraged and supported</li> <li>▪ To determine if creativity measures are perceived to be good for business</li> <li>▪ To identify barriers to effective creativity in European SMEs</li> <li>▪ To develop a knowledge repository to help people become more creative and innovative</li> <li>▪ To promote good practices, key success factors, methodologies</li> </ul>
<b>Enterprise Size</b>	<ul style="list-style-type: none"> <li>▪ Organisations with no more than 50 employees</li> </ul>
<b>Target audience</b>	<ul style="list-style-type: none"> <li>▪ Innovation agents within technology and innovation providers, e.g. BIC, technology centres; technology transfer offices, etc.</li> <li>▪ Main clients of the innovation agents should focus on service innovation (either the service as an end-product itself or the service as an add on to a tangible product)</li> </ul>
<b>Time</b>	<ul style="list-style-type: none"> <li>▪ Limited to roughly 15 minutes to complete (taking target population into consideration)</li> </ul>
<b>Approach</b>	<ul style="list-style-type: none"> <li>▪ 15-20 questionnaires per partner</li> </ul>

---

## 4.2 UNDERSTAND KEY SUCCESS FACTORS AND PROBLEMS

In order to identify where the barriers that currently exist with respect to creativity management in SMEs an initial study was undertaken by innovate using focused workshop techniques. The workshop was targeted at managers of small organisations in the west of Ireland. The aim of the workshop was to identify and prioritise the key problems with creativity management that these organisations face on a daily basis. The primary research mechanism used to organise and correlate the workshop output was nominal group techniques. Nominal group techniques provide a reliable structure for a group discussion. This method is particularly useful when (a) the issues that surrounding the problem appear large and complex, (b) the information relevant to the problem appears in unorganised thoughts and ideas and finally (c) where group consensus is required (or desired). This approach is an effective use of both time and effort and also facilitates the cross fertilisation of ideas. During the workshop each team member, in turn, identified key barriers to effective creativity management. Participants were then invited to reflect and record their suggestions on paper. Participants then discussed the merits of each item. Further discussions for the purpose of clarification also took place. Each item was then reviewed and duplications were eliminated by the facilitator who also ensured that all suggestions were clearly understood by all participants. Individual barriers were then grouped into related categories. The grouping helped to develop a common understanding of the problem. A voting procedure was used to rank all categories in order of priority. Here each participant was asked to select the top three items that (s)he considered to be the most important and rank them in order of priority. To do this they were each given three votes; one had a value of three points, the second had a value of two points and the third had a value of one point. They then assigned scores of three, two and one in order of importance to the categories they felt were the key barriers to effective creativity management. Finally, the results were compiled and each category was assigned an aggregate score on the basis of the individual scores.

### 4.2.1 FINDINGS FROM THE WORKSHOP AND LITERATURE SYNTHESIS

While it is apparent that there are many factors that can facilitate and thus impede creativity management within organisations some issues came to the fore by mutual consensus. These issues include:

#### **Leadership**

Effective leadership is important for successful idea generation and creativity. Leaders have the ability to influence a group towards the achievement of goals (Robbins, 1998; Ahmed, 1998). To do this they must establish and communicate goals (Finnie and Early, 2002) build trust and inspire teamwork (Thite, 1999; Robbins, 1998). Defining a clear purpose and strategic intent are critical to the success of all creative endeavours (Ulrich, 1998; Kotnour et al., 1997).

#### **Culture**

Many researchers agree that creating a culture and climate for knowledge generation, transfer and use has a positive impact on organisational performance (McDermott and O'Dell, 2001; Banks, 1999; Ahmed, 1998; Davenport and Prusak, 1998; Buckler, 1997). Culture is considered to be made up of a collection of fundamental values and belief systems which give meaning to organisations. It is created from a broad range of internal and external influences, some of which are difficult to manage (Alvesson, 1991). An

---

organisation's culture can either promote or inhibit creative practices. For example, a culture of openness, confidence and trust is required to encourage the application and development of knowledge within an organisation, while factors such as suspicion, fear and detachment are found to inhibit this process (Scarborough et al., 1999; Banks, 1999). Key success factors that support a knowledge oriented culture include (a) developing a visible connection between sharing knowledge and practical business objectives (b) integrating knowledge creation and transfer with an existing key business initiative, (c) aligning reward and recognition structures to support knowledge transfer and reuse.

### **Structure**

An organisation's structure has been identified as a critical success factors for knowledge based work. Traditional functional oriented structures previously lauded for their effectiveness and control are no longer appropriate in today's dynamic environment. Knowledge creation and transfer demands interactions between different organisational functions whose expertise skills and experience are mutually reinforcing and cumulative. In addition, research indicates that organisations leverage individual talents into collective achievements through networks of people who collaborate (Hildreth et al., 2000; Swan et al., 1999). Work teams are emerging as the dominant organisational component of the new economy. They are more consistent with flatter, more flexible and more responsive organisations. Cross functional teams and Communities of practice are ideal mechanisms for capitalising on multiple perspectives. They create value for their individual members as well as the organisation.

### **Motivation**

Peoples' ideas, skills, experience and motivation are imperative for successful idea generation and creativity. Motivation theory suggests that individuals respond positively to stimuli that reward achievement and performance. Performance measurement and reward systems are key elements in aligning the interests of employees to that of the organisation (Liebeskind, 1996; Bukowitz and Pertrash, 1997). They can be adjusted to encourage the desired behaviour from all staff. Therefore, if organisations wish to encourage creative activities such as knowledge sharing and reuse they must design motivation and measurement systems that incorporate these activities.

### **Communication**

The creative process can be described as an information transformation process where information is gathered, processed and transferred. The right information must be made available to the right place, at the right time, and in the right format. Therefore, communication is a vital and basic necessity. Frequent communication increases the amount of information directly in that more communication usually yields more information. Collaboration facilitates the cross fertilisation of ideas. Communication among employees and with outsiders stimulates their performance. Thus, the better that members are connected with each other and with key outsiders the better their performance.

---

### 4.3 DEVELOP TOOLS

Data collection methods can be quantitative and qualitative in nature and they include activities such as; (a) participant observation, (b) interviews, (c) observation, (d) documentary materials and (e) questionnaires. A combination of these data collection methods should be used to elicit information in this analysis. By adopting this approach, the strengths of one data collection method compensates for the weaknesses of the other. In addition, the subject can be examined from different angles and a more complete picture of the situation is provided.

The principal data collection method for the Creatin project is the Creativity Management scorecard (see table 2). The aim of this scorecard is to ascertain (a) attitude and perception towards creativity issues; (b) the extent and nature of creative initiatives in the organisation; (c) the barriers experienced; and finally (d) whether specific structures, systems and culture are in place to enable effective creativity management in SMEs. The scorecard can be completed on a stand alone basis or it can act as a guide for structured interviews. It contains an explicit set of carefully chosen and justified statements. The statements have been formulated from best practice concepts that have been compiled from workshops and justified by literature searches. Here respondents are requested to circle the extent to which they agree or disagree with the statements. The scorecard should help to identify the relative strengths (to be exploited) and weakness (to be improved) regarding creativity in the organization. This will enables managers and decision makers to get an overview of their company's strengths and weaknesses with regard to creativity management highlighting those areas that require attention.

The advantages from the projects team's perspective of using the Creativity Management scorecard as a data collection tool include:

- Responses are gathered in a standardised way
- Relatively quick to collect information and easy to use
- Can collected from a large portion of a group
- Can capture observations and contextual data

Table 2: Creativity Scorecard

<b>Please circle the extent to which you agree or disagree with these statements where 1 represents strongly agree and 5 represents strongly disagree</b>					
<b>Statement</b>	<b>Score</b>				
<b>Leadership</b>					
1. Clear strategies are defined	1	2	3	4	5
2. Strategies are communicated to all employees	1	2	3	4	5
3. Leaders create a vision and communicate this by setting clear objectives	1	2	3	4	5
4. Top management actively promotes creativity and innovation	1	2	3	4	5
5. Non conformity is tolerated	1	2	3	4	5
6. Leaders encourage champions	1	2	3	4	5
7. Leaders visibly drive innovation	1	2	3	4	5
8. Leaders adopt a consensus and shared approach to decision making	1	2	3	4	5
9. Leaders adopt a participative decision making style	1	2	3	4	5
10. Senior management actively encourages the submission of new product ideas	1	2	3	4	5
<b>Culture</b>					
1. The organisation's culture promotes idea generation	1	2	3	4	5
2. A formal idea generation process is in place	1	2	3	4	5
3. Our employees have a diverse range of interests	1	2	3	4	5
4. Risk taking is actively encouraged	1	2	3	4	5
5. There is a high level of trust in the organisation	1	2	3	4	5
6. Adequate resources are dedicated to achieve creativity goals	1	2	3	4	5
7. All employees participate in generating ideas	1	2	3	4	5
8. Information and knowledge is shared throughout the company	1	2	3	4	5
9. All operations are driven by customer needs	1	2	3	4	5
10. An effective mentoring system is in place	1	2	3	4	5
<b>Structure</b>					
1. The organisational structure is flexible and organic	1	2	3	4	5
2. The structure enables the voice of the customer to be captured effectively	1	2	3	4	5
3. The organisational structure promotes idea generation and learning	1	2	3	4	5
4. Autonomous cross-functional teams are used to implement projects	1	2	3	4	5
5. Project teams are organic, flexible and agile	1	2	3	4	5
6. All team operations are driven by customer needs	1	2	3	4	5
7. Team members are mutually accountable	1	2	3	4	5
8. Team members are empowered to make decisions	1	2	3	4	5
9. Communities of practice are used to optimise core competencies	1	2	3	4	5
10. There is a high level of co-operation across the organisation	1	2	3	4	5
<b>Motivation</b>					
1. Effective performance indicators are used to measure progress	1	2	3	4	5
2. Performance indicators encourage desired behaviour	1	2	3	4	5
3. Knowledge sharing and reuse is rewarded	1	2	3	4	5
4. Success is recognised in our company	1	2	3	4	5
5. All team members are mutually accountable	1	2	3	4	5
6. Adequate and effective training is provided to all employees	1	2	3	4	5
7. We are given some freedom to pursue our own ideas	1	2	3	4	5
8. We are given lots of autonomy to make decisions	1	2	3	4	5
9. Failures and mistakes are tolerated and not punished	1	2	3	4	5
10. Money is made available for internal projects	1	2	3	4	5
<b>Communication</b>					
1. Virtual team members are equipped with effective IT tools to communicate	1	2	3	4	5
2. The right information is available at the right time and in the right format	1	2	3	4	5
3. Collaboration is imperative to facilitate the cross fertilisation of ideas	1	2	3	4	5
4. Alliances are formed with other organisations for mutual benefit	1	2	3	4	5
5. Communication among team members is efficient and effective	1	2	3	4	5
6. Communication between project teams is efficient and effective	1	2	3	4	5
7. Information on ideas generated and problems raised are accessible to all	1	2	3	4	5
8. Individuals collaborate to solve problems	1	2	3	4	5
9. Individual skills are effectively leveraged within and between project teams	1	2	3	4	5
10. Virtual team members are able to seamlessly communicate with each other	1	2	3	4	5

#### **4.4 TEST TOOLS**

The Creativity scorecard was piloted and tested via an open workshop to ensure that (a) it was easy to understand; (b) covered all the correct relevant material; and finally (c) applicable to the specific target audience. On receipt of this feedback the scorecard was amended and altered according to the comments received from the workshop participants. It is important to note that during this process every effort was made to keep the final draft of the scorecard short and concise but as rich as possible without losing the ability to capture the maximum amount of critical data. The scorecard was also tested and validated by several researchers at the National University of Ireland, Galway. Table 3 provides a list of the criteria for assessment.

Table 3: Validation Criteria

Criteria	Description
Effective	Does the methodology work? Does it solve the problems, or produce the products, for which it is intended?
Efficient	Are all the tasks and activities prescribed by the methodology strictly necessary? Are all legitimate short cuts exploited? Is there any repetitive or redundant effort?
Universally applicable Comprehensive	Does the methodology work in any organization size or culture, or does it assume a particular organization or management style? If there are any restrictions on the range of situations that the methodology can handle, are these restrictions well understood?
Reliable Accurate	What risks are involved in using the methodology? How are the risks minimized?
Stable Robust Flexible Evolving	Is the methodology tolerant of minor errors and alterations? Does the methodology allow for human imperfection? Does the methodology contain a self-preservation mechanism, to maintain its relevance within the organization? Is the methodology capable of incremental change, to cope with new ideas or technological opportunities? Is the methodology capable of incorporating improvements learned from experience?
Simple and easy to learn and use Acceptable to participants	Is the methodology targeted at a well-defined population? Is the methodology based on a coherent set of concepts and techniques? Are all the concepts and techniques strictly necessary? Is it easy to motivate people to adhere to the methodology?
Well supported	To what extent are relevant tools, skills and services currently available to support this methodology?

The validation of the survey and the positive feedback received has indicated that the Creativity Management scorecard is a useful and effective tool for gathering the critical information concerning creativity management in European SMEs.

## 4 CONCLUSIONS

Research indicates that an organisation's core competencies will centre on managing the creative capacity of its workers in the future. It seems that industrial growth and productivity gains will depend heavily on improvements in creativity. Thus, a viable approach is critically needed. The Creatin project aims to improve the capacity of European SME's. To do this, the team aims to identify and prioritise the key barriers that currently exist to creativity in European SMEs. In order to do this a scorecard was developed based on a literature and an initial study on the voice of the industry. Scorecards can help analysts and decision makers to identify gaps between their current and desired performance. They enable decision makers to identify where successful strategies can be further exploited and pinpoint where problems, or potential, problems lie. Furthermore, they provide the necessary information that can be used to develop action plans to improve performance. The scorecard was then tested to ensure that it was accurate, relevant and easy to follow. It is hoped that all the partners in the Creatin project will use this scorecard in their regions to assess the nature of creativity management in European SMEs and the barriers that impede it. From this analysis we hope to gain an accurate representation of the training needs of European SME's so that specific support structures can be developed and disseminated.

---

## 6 REFERENCES

- Ahmed, P.K. (1998) Culture and climate for innovation, *European Journal of Innovation Management*, 1, pp 30-43.
- Alvesson, M. (1991) Organisational symbolism and ideology. *Journal of Management Studies*, 28, 3, pp 207-225.
- Amabile 1997), Amabile, T. M. (1988). "A model of creativity and innovation in organizations." *Research and Organizational Behavior* 10: 123-167
- Amabile, T.M. (1988) A model of creativity and innovation in Organisations. *Research in Organizational Behaviour*, 10, pp 123-167.
- Amabile, T.M. (1983) *The Social Psychology of Creativity*. New York: Springer-Verlag
- Banks, E. (1999) Creating a knowledge culture, *Work Study*, 48, 4.
- Buckler, S.A. (1997), The spiritual nature of innovation, *Research-Technology Management*, March-April, pp. 43-7.
- Bukowitz, W. and Petrash, G. (1997) Visualizing, measuring and managing knowledge, *Research Technology Management*, 40, pp 24-31.
- Cormican, K and O'Sullivan, D. (2003) A Scorecard for Supporting Enterprise Knowledge Management. *International Journal for Information and Knowledge Management*, 2, 3, pp 191-201.
- Creswell, J.W., (2003) *Research Design Qualitative, Quantitative, and Mixed Methods Approaches*, 2<sup>nd</sup> edition, Sage publications
- Cumming, B. (1999) *Understanding Innovation from Cradle to Grave*, Butterworth-Heinenmann, Oxford.
- Cunnane, D. (1994) *Creativity and Innovation at work*. Unpublished conference paper. National Centre for Quality Management. University of Limerick.
- Davenport, T.H. and Prusak, L. (1998) *Working Knowledge: How Organisations Manage What They Know*, Harvard Business Press, Boston.
- Davenport, T.H., De Long, D.W. and Beers, M.C. (1998) Successful knowledge management projects, *Sloan Management Review*, Winter, pp 43-57.  
(de Bono 1981)

- 
- Ettlie (2000) Ettlie, J., E. (2000). *Managing Technology Innovation*. New York, John Wiley & Sons Inc.
- Farr, J.L. and Ford, C.M., (1990) *Individual Innovation*. In M.A. West and J. Farr (eds), *Innovation and Creativity at Work*. Chichester: Wiley.
- Grønhaug, K. and Olson O. (1999). *Action research and knowledge creation: Merits and challenges*. *Qualitative Market Research: An International Journal* 2 (1), pp 6-14.
- Gupta and Singhal (1993) Gupta, A.K. and Singhal, A. (1993). *Managing Human Resources for Innovation and Creativity*, *Research Technology Management*. (May-June): p. 41-48
- Hair J.F., Babin B., Mooney A. H., Samuel P., (2003) *Essentials of Business Research Methods*, Wiley, International edition.
- Hildreth, P., Kimble, C., Wright, P. (2000) *Communities of practice in the distributed international environment*, *Journal of Knowledge Management*, 4, 1, pp 27-38.
- Jones, 1972).
- Kaplan, B. and Maxwell, J.A. (1994) *Qualitative Research Methods for Evaluating Computer Information Systems*, in *Evaluating Health Care Information Systems: Methods and Applications*, J.G. Anderson, C.E. Aydin and S.J. Jay (eds.), Sage, Thousand Oaks, CA, pp. 45-68.
- King, N. (1990) *Innovation at Work: The Research Literature*, In M.A. West and J.L. Farr (Eds.). *Innovation and creativity at work*. Wiley: Chichester.
- Kotnour, T., Orr, C., Spauding, J. and Guidi, J. (1997) *Determining the Benefits of Knowledge Management Activities*. In *IEEE International Conference on Systems Man & Cybernetics*, Vol. 1, Orlando, Florida.
- Lee, T. W. (1999) *Using Qualitative Methods in Organizational Research*, Sage, Thousand Oaks, CA.
- Liebeskind, J.P. (1996) *Knowledge, strategy and the theory of the firm*, *Strategic Management Journal*, 17, pp 93-109.
- McDermott, R. and O'Dell, C. (2001) *Overcoming cultural barriers to sharing knowledge*, *Journal of Knowledge Management*, 5, 1, PP 76-85.
- Robbins, S.P. (1998) *Organizational Behavior: Concepts, Controversies, Applications*, Prentice Hall.
- Rosenfeld, R. and Servo J.C. (1990) *Facilitating organisation in large organisations*. In M.A. West and J. Farr (eds), *Innovation and Creativity at Work*. Chichester: Wiley.
- Swan, J., Newell, S., Scarbrough, H. and Hislop, D. (1999) *Knowledge management and innovation: networks and networking*, *Journal of Knowledge Management*, 3, 4, pp 262-275.

---

Thite, M. (1999) Identifying key characteristics of technical project leadership, *Leadership and Organization Development Journal*, 20, 5, pp 253-261.

Tidd et al. (1997) Tidd, J., Bessant, J. and Pavitt, K., (1997). *Managing Innovation: Integrating technological, market and organizational change*. Chichester., John Wiley & Sons Ltd.

Tidd, J., Bessant, J. and Pavitt, K. (1997) *Managing Innovation: Integrating Technological, Market and Organisational Change*, John Wiley & Sons, Chichester.

Tidd, P.T. (1997) *Revolutionizing Product Development: A Blueprint for Success in the Global Automative Industry*. FT Management Report, London.

Trott, P. (1998) *Innovation Management & New Product Development*, Financial Times Management, London.

Ulrich, D. (1998) Intellectual Capital = Competence \* Commitment, *Sloan Management Review*, Winter, 1998, pp 15-26.

West et al., (1990). West, M. A. and Farr, J. (1990). *Innovation and Creativity at Work*. Chichester, Wiley.

Woodman, R.W., Sawyer, J. E. and Griffen, R.W (1993) Toward a theory of creativity. *Academy of Management Review*, 18; 2, pp 293-321.

Yin, R. K. (2002) *Case Study Research, Design and Methods*, 3rd ed. Newbury Park, Sage Publications

---

**7 BIBLIOGRAPHY****SELECTED BOOKS FOR AN INTRODUCTION TO CREATIVITY**

There is a substantial and growing literature dealing with the topic of creativity. Aside from three dedicated journals: the *Journal of Creative Behavior* (since 1967), the *Creativity Research Journal* (since 1988), and *Creativity and Innovation Management* (since 1992), numerous articles and books have been published on creativity. This selected bibliography provides an initial listing of books I've found particularly helpful, and have recommended to people who have an interest in our field.

**EDITED COLLECTIONS**

Aleinikov, A. G. (Ed.). (2002). *The future of creativity: The University of Georgia Dr. E. Paul Torrance Annual Lectures on Creativity*. Bensenville, IL: Scholastic Testing Services.

This edited collection contains papers from 15 noted authorities within the field of creativity development and research, many of whom were previous invited lecturers at the University of Georgia.

Aleinikov, A. G., Kackmeister, S., & Koenig, R. (Eds.). (2000). *Creativity: 101 definitions*. Midland, MI: The Alden B. Dow Creativity Center Press.

A compilation of definitions of creativity from leading thinkers in the field.

Anderson, H. H. (Ed.). (1959). *Creativity and its cultivation*. NY: Harper.

Interdisciplinary perspectives on the nature and nurture of creativity presented by 15 eminent authors; a variety of addresses delivered at the Interdisciplinary Symposia on Creativity at Michigan State University.

Boden, M. A. (Ed.). (1994). *Dimensions of creativity*. Cambridge, MA: The MIT Press.

An interdisciplinary edited collection of current thinking about creativity. A major focus on theoretical definitions and approaches is complemented from research and practice from seven very diverse perspectives.

Grønhaug, K. & Kaufmann, G. (Eds.). (1988). *Innovation: A cross-disciplinary perspective*. Oslo, Norway: Norwegian University Press.

International collection of interdisciplinary perspectives on creativity and innovation. Provides a comprehensive group of summaries of major historical as well as current work in the field.

---

Gryskiewicz, S. S., & Hills, D. A. (1992). Readings on innovation. Greensboro, NC: Center for Creative Leadership.

This edited collection is drawn from ten years work of Creativity Week Proceedings. These papers were presented at these International Symposia hosted by the Center for Creative Leadership.

Gryskiewicz, S. S. (Ed.), (1998). Discovering creativity: Proceedings of the 1992 International Creativity & Innovation Networking Conference. Greensboro, NC: Center for Creative Leadership.

This book provides the papers presented at the 1992 International Conference hosted by the PRISM group at the Center for Creative Leadership.

Ijiri, Y. & Kuhn, R. L. (Eds.). (1988). New directions in creative and innovative management: Bridging theory and practice. Cambridge, MA: Ballinger Publishing Company.

Provides a summary of a conference from Carnegie Mellon with the same title. Includes twenty chapters covering the 'emerging discipline' of creative and innovative management.

Isaksen, S. G. (Ed.). (1987). Frontiers in creativity research: Beyond the basics. Buffalo, NY: Bearly Limited.

Provides a summary of what is known in the field through the work of twenty noted writers and researchers; includes new questions and challenges.

Isaksen, S. G., Murdock, M. C., Firestien, R. L., & Treffinger, D. J. (Eds.). (1993). Understanding and recognizing creativity: The emergence of a discipline. Norwood, New Jersey: Ablex Publishing.

Isaksen, S. G., Murdock, M. C., Firestien, R. L., & Treffinger, D. J. (Eds.). (1993). Nurturing and developing creativity: The emergence of a discipline. Norwood, New Jersey: Ablex Publishing.

These two edited collections were drawn from two international creativity and innovation networking conferences hosted by the Center for Studies in Creativity in Buffalo in 1990. The collections represent an international compendium of creativity practitioners and researchers.

Joyce, M., Isaksen, S., Davidson, F., Puccio, G., Coppage, C., & Maruska, M. (Eds.). (1997). An introduction to creativity (2<sup>nd</sup> ed). Acton, MA: Copley.

A collection of readings designed to provide a basic introduction to the topic of creativity from the perspective of creative people, processes, product, and environment.

---

Parnes, S. J. & Harding, H. F. (Eds.). (1962). A source book for creative thinking. NY: Scribners.

Includes twenty-nine articles and addresses as well as over seventy-five research summaries.

Parnes, S. J. (Ed.). (1992). Source book for creative problem solving. Buffalo, NY: Creative Education Foundation Press.

Includes 55 articles, some previously published, that provide a foundation for understanding and facilitating creative problem solving.

Puccio, G. J., & Murdock, M. C. (Eds.). (1999). Creativity assessment: Readings and resources. Buffalo, NY: Creative Education Foundation Press.

A comprehensive resource on the topic of creativity assessment including information of specific measures and many useful articles.

Raina, M. K. (Ed.). (1980). Creativity research: International perspective. New Delhi, India: National Council of Educational Research and Training.

Research evidence on creativity from an international perspective by 30 authors representing seventeen different countries.

Rothenberg, A. & Hausman, C. R. (Eds.). (1976). The creativity question. Durham, NC: Duke University Press.

A collection of forty-five writings showing a historical thread about the nature of creativity from Plato to twentieth-century writers.

Sternberg, R. J. (Ed.). (1988). The nature of creativity: Contemporary psychological perspectives. Cambridge, MA: Cambridge University Press.

A narrow but thorough collection of chapters focusing on some of the major psychological approaches to understanding creativity. Contains numerous research summaries.

Sternberg, R. J. (Ed.). (1999). Handbook of creativity. Cambridge, UK: Cambridge University Press.

This book contains 22 chapters by a variety of psychologists who have conducted original research into the nature of creativity.

Taylor, C. W., & Barron, F. (Eds.). (1963). Scientific creativity: Its recognition and development. NY: Wiley.

---

Selected papers from the Utah Conference identifying the fundamental nature of scientific creative talent, addresses criteria, characteristics, environmental conditions, and process.

Taylor, I. A. & Getzels, J. W. (Eds.). (1975). *Perspectives in creativity*. Chicago, IL: Aldine Publishing Company.

A collection of fourteen chapters written by the major researchers and thinkers within the field. Provides a twenty-five year summary of the major approaches and findings from creativity research and development.

Tuerck, D. G. (Ed.). (1987). *Creativity and liberal learning: Problems and possibilities in American education*. Norwood, NJ: Ablex Publishing.

Papers, comments and discussion from seventeen presentations and meetings on the role of creativity in liberal education. Complete record of two conferences held at Suffolk University.

Ward, T. B., Smith, S. M., Vaid, J. (Eds.). (1997). *Creative thought: An investigation of conceptual structures and processes*. Washington, DC: American Psychological Association.

This edited work contains many useful chapters that provide a conceptual, empirical, and theoretical foundation for understanding people and processes associated with creativity.

## OTHER WORKS

Amabile, T. M. (1996). *Creativity in context: An update to the social psychology of creativity*. Boulder, CO: Westview Press.

Provides a framework for understanding creativity and identifies the importance of intrinsic motivation and introduces the social psychology of creativity.

Arieti, S. (1976). *Creativity: The magic synthesis*. NY: Basic Books.

A cross-disciplinary review and synthesis of creativity that works to demystify the topic and provide the needed background for those who want to understand and develop creativity.

Boden, M. A. (1991). *The creative mind: Myths and mechanisms*. NY: Basic Books.

This book describes creativity in terms of exploring conceptual spaces in the mind. It provides a scientific explanation for the mechanisms of creative thought.

Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. NY: Harper/Collins.

Based on 91 interviews, this book describes many aspects of the person and the situation and culture that supports creativity.

Dacey, J. S. (1989). *Fundamentals of creative thinking*. Lexington, MA: Lexington Books.

A comprehensive work designed to address the questions of "What creativity is?" and "How creativity develops?" Provides a summary of a variety of theories and approaches to creativity.

Dacey, J. S., & Lennon, K. H. (1998). *Understanding creativity: The interplay of biological, psychological, and social factors*. San Francisco, CA: Jossey-Bass.

The latest integration of research that provides a historical and conceptual understanding of the concept of creativity.

Getzels, K. W. & Csikszentmihalyi, M. (1975). *The creative vision: A longitudinal study of problem finding in art*. NY: John Wiley & Sons.

An analytic description of the creative process in context focusing on artists and their problem finding behavior.

Guilford, J. P. (1979). *Way beyond the IQ: Guide to improving intelligence and creativity*. Buffalo, NY: Creative Education Foundation and Creative Synergetic Associates.

A practical guide to the interpretation and application of the Structure of the Intellect Model; diagnostic approach with curricular implications.

MacKinnon, D. W. (1978). *In search of human effectiveness: Identifying and developing creativity*. Buffalo, NY: Creative Education Foundation and Creative Synergetic Associates.

Concerns the creative development of self and others through MacKinnon's vast background in the nature and nurture of creativity.

Osborn, A. F. (1979). *Applied imagination: Principles and procedures of creative problem solving*. NY: Charles Scribner's Sons.

A classic introduction to principles and procedures of creative problem solving originally published in 1953. Conditions for creativity, principles of deferred judgment, brainstorming and idea checklists are emphasized.

---

Stein, M. I. (1974). *Stimulating creativity: Individual procedures*. NY: Academic Press.

A comprehensive review of research and practical approaches aimed at stimulating creativity from an individual perspective.

Stein, M. I. (1975). *Stimulating creativity: Group procedures*. NY: Academic Press.

A comprehensive review of research and practical approaches to stimulate group creativity.

Torrance, E. P. & Myers, R. E. (1970). *Creative learning and teaching*. NY: Harper & Row.

Discussion, applications and techniques pertinent to developing creative potential in education.

### **ADDITIONAL PRACTICAL RESOURCES**

Adams, J. L. (2001). *Conceptual blockbusting: A guide to better ideas*. Cambridge, MA: Perseus.

Examines blocks and obstacles to creative thinking as well as strategies to overcome them. Includes checklists, attribute listing, alternate problem solving languages and morphological analysis.

Davis, G. A. (1986). *Creativity is forever* (2<sup>nd</sup> ed.). Dubuque, IA: Kendall/Hunt.

Readable work for those interested in becoming more creative or in assisting others to think more creatively; includes an explanation of theories, definitions and techniques. (Later editions have been published.)

Feldhusen, J. F., & Treffinger, D. J. (1985). *Creative thinking and problem solving in gifted education* (3rd ed.). Dubuque, IA: Kendal/Hunt.

Excellent guide to teaching creative problem solving and creative thinking; includes modes, methods and a comprehensive review of materials and resources.

Isaksen, S. G. (2000). *Facilitative leadership: Making a difference with creative problem solving*. Dubuque, IA: Kendall/Hunt Publishing.

This book provides a conceptual and practical basis for facilitating creative problem solving as well as a comprehensive summary of research supporting the positive impact of CPS.

---

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (2000). *Creative approaches to problem solving: A change method*. Dubuque, IA: Kendall/Hunt Publishing.

A current overview and introduction to the creative problem solving method including tools and guidelines. Emphasis in on the current version of CPS (CPS version 6.1™).

Kelly, T. (2001). *The art of innovation: Lessons in creativity from IDEO, America's leading design firm*. NY: Currency.

This very practical book shares the insights on the method used by IDEO to produce innovation.

Nayak, P. R., & Ketteringham, J. M. (1986). *Breakthroughs! How the vision and drive of innovators in sixteen companies created commercial breakthroughs that swept the world (based on a study of innovation by Arthur D. Little, Inc.* NY: Rawson Associates.

A very practical book telling the stories of VCR's, Postits, Federal Express and many other commercial successes.

Parnes, S. J., Noller, R. B., & Biondi, A. M. (1977). *Guide to creative action*. NY: Charles Scribner's sons.

A comprehensive summary of resources that includes rationale, instructional resources, activities and illustrations for brainstorming, deferred judgment, forced relationships and methods for each step of the creative problem solving process.

Rickards, T. (1988). *Creativity at work*. Brookfield, VT: Gower Publishing Co.

A current summary of major international efforts to use creative problem solving. Includes both useful background information as well as case studies and applications.

Rickards, T. (1999). *Creativity and the management of change*. Maiden, MA: Blackwell.

This book is written for managers who are searching for an improved understanding of creativity and innovation.

Tanner, D. (1997). *Total creativity in business and industry: Road map to building a more innovative organization*. Des Moines, IA: Advanced Practical Thinking Training Inc.

A practical book including the stories of five DuPont company innovations ranging from Kevlar® to crawfish bait.

Torrance, E. P. (1979). *The search for satori and creativity*. Buffalo, NY: Creative Education Foundation & Creative Synergetic Associates.

---

A clear informative work clarifying major constructs that underlie creative thinking; contains suggestions for application and practice.

Treffinger, D. J., Isaksen, S. G., & Dorval, K. B. (2000). *Creative problem solving: An introduction* (3<sup>rd</sup> ed.). Waco, TX: Prufrock Press.

This book provides a short overview of and introduction to the current approach to creative problem solving (CPS version 6.1™).

Treffinger, D. J., Isaksen, S. G., & Firestien, R. L. (1982). *Handbook of creative learning* (volume 1). Williamsville, NY: Center for Creative Learning.

A guide on research and application of creative problem solving; focus on facilitation of problem solving groups. Also reviews theories of creativity and contains samples of actual CPS sessions.

### **EACI CONFERENCE PROCEEDINGS**

Colemont, P., Grøholt, P., Rickards, T., & Smeekes H. (Eds.). (1988). *Creativity and innovation: Towards a European Network*. Dordrecht, NL: Kluwer Academic Publishers.

Proceedings of the first European Association for Creativity and Innovation Conference.

Rickards, T., Colemont, P., Grøholt, P., Parker, M., & Smeekes, H. (Eds.). (1991). *Creativity and innovation: Learning from practice*. Delft, NL: Innovation Consulting Group TNO.

Proceedings of the second European Association for Creativity and Innovation Conference.

Rickards, T., Moger, S., Colemont, P., & Tassoul, M. (Eds.). (1992). *Creativity and innovation: Quality breakthroughs*. Delft, NL: Innovation Consulting Group TNO.

Proceedings of the third European Association for Creativity and Innovation Conference.

Geshka, H., Moger, S., & Rickards, T. (Eds.). (1994). *Creativity and innovation: The power of synergy*. Darmstadt, Germany: Geshka & Partner Unternehmensberatung.

Proceedings of the fourth European Association for Creativity and Innovation Conference.

Rickards, T., Moger, S., Tassoul, M., van de Kimmenade, I., & van den Beuken, J. (Eds.). (1997). *Creativity and innovation: Impact*. Maastricht, NL: European Association for Creativity and Innovation.

Proceedings of the fifth European Association for Creativity and Innovation Conference.

---

Van Geffen, L., van der Meer, H., & Rickards, T. (Eds.). (2001). *Creativity and innovation: Fit for the future*. Enschede, NL: Twente University Press.

Proceedings of the sixth European Association for Creativity and Innovation Conference.

Buijs, J., van der Lugt, R., & van der Meer, H. (Eds.), (2002). *Idea safari: Proceedings of the seventh European Conference on creativity and innovation*. Enschede, NL: Twente University Press.

Proceedings of the seventh European Association for Creativity and Innovation Conference.