TOWARDS AN INTEGRATIVE MODEL OF CREATIVITY AND INNOVATION IN ORGANISATIONS: A PSYCHOLOGICAL PERSPECTIVE

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LINKING INNOVATION AND CREATIVITY: A PSYCHOLOGICAL PERSPECTIVE

Abstract

Work and Organisational (W/O) Psychologists have much to offer the world of business. This article addresses the value that research into creativity, primarily investigated by psychologists, has to the field of innovation, more commonly researched in business, science and technology arenas. Firstly, the article provides a framework to compare previous research in both areas. Secondly, it highlights clear gaps in prior research and generates a model, alongside a series of propositions, to guide future investigators. These propositions include suggestions regarding (i) creativity and innovation as concurrent processes engaged in at multiple levels, (ii) the shift in focus from creativity at the individual level, to innovation as one moves through meso and macro levels, (iii) the potential of the organisational level for studying creativity and innovation in tandem, and (iv) the multiple factors that influence the processes of innovation and creativity at all levels. Finally, this paper highlights the need for multidisciplinary research that spans the domains of psychology, business, science and technology and serves as a call for W/O psychologists to engage in such research so as to provide value to organisations.
Introduction

Innovation is fast becoming a buzz word in management and organisational science. This article argues that Work and Organisational (W/O) psychologists have a distinct role to play in advancing theory and research in innovation. This role is partially mediated by the research that has been undertaken by psychologists in the area of creativity. The review aims to show how such research can add value in the area of innovation; an area not traditionally tackled by W/O psychologists to any great extent. This review considers micro (individual), meso (team) and macro (organisational) influences in both the areas of creativity and innovation, as well as research suggesting the importance of considering interactive processes between these levels. It concludes by proposing a model for the integration of creativity and innovation at all levels of analyses.

Many corporate CEOs, consultants and academics proclaim that innovation is the key to achieving competitive strategic advantage now and in the future (McFadzean, 1998a). In a recent survey, eighty per cent of managers named creativity as one of the most important elements in corporate success, yet less than five per cent of organisations actually put this emphasis into practice (Walton, 2003). Peters (1997) holds the view that the world of business is in a permanent state of flux where constant innovation is the only strategy for survival for both the individual and the organisation. W/O psychologists have an important role to play in helping organisations to improve their levels of creativity and innovation, as well as to utilise them more effectively, and this will ultimately lead to an increase in corporate success. If this is to be done, however, it is imperative that W/O psychologists engage in multi-disciplinary research which incorporates the study of both creativity and innovation.
While much research has been conducted in both the areas of innovation and creativity, one of the primary problems is that there has been little integration between the two areas. While creativity has traditionally been the study of psychologists, innovation has been studied in the areas of sociology, economics, engineering and organisational theory (Ford, 1996, Isaksen & Tidd, 2006). Such exclusivity of foci has led to disagreement with regard to definitions of these areas, as well as disagreement regarding the links between them. A central issue for organisations who value innovation is how to select, develop and motivate individuals capable of formulating ideas in the first place, and also to create the supportive environment in which groups can productively and swiftly implement them (Searle & Ball, 2003).

Psychologists have tended to shy away from the more technological or business level topics of innovation and entrepreneurship in favour of research on creativity. However, psychologists have much to offer in these areas of research, not least in the level of rigorous analysis which they can bring to the field. Equally, as Fillis and McAuley (2000) point out, creativity is not just for psychologists, but currently, they probably have a greater appreciation of creativity than those in management or scientific disciplines. Historically, W/O psychologists have specialised their efforts towards measuring variables at the individual level of analysis, an individuals’ propensity to innovate being one among a vast number of such individual level variables (Anderson & West, 1996). An evolving trend in organisational psychology is the emergence of constructs such as culture and climate as variables for analysis (Anderson & West, 1996) leading psychologists towards a more macro or organisational level in contrast to the traditional individual level of analysis. The challenge for W/O psychologists is to have a greater impact in such debates aimed at the organisational level or wider; Anderson and West (1996) call for organisational psychologists to apply their existing competencies in
measurement, which are largely unique compared with management consultants, organisation development practitioners or scientists, to collective level variables.

Insert Table 1 here

Unless constructs relating to the phenomena of innovation and creativity are measurable using commonly accepted methods, there is a risk that different operationalizations of the same effect will produce conflicting findings, and that theoretical advances become lost in the different terminologies that resist the accumulation of knowledge (Adams, Bessant & Phelps, 2006). Table 1 gives a brief summary of some contradictions currently evident in creativity and innovation. It is of the utmost importance that researchers from the various disciplines involved in studying creativity and innovation come together to advance theory and research in these areas. Until such time as this happens, the problems associated with conflicting findings and differing operationalizations cannot be tackled.

**Creativity and Innovation**

In order to develop commonly accepted methods to investigate creativity and innovation, it is firstly important to consider the various definitions of creativity and innovation which exist in the literature. In doing so, we gain a clearer understanding of basic similarities and differences between the two constructs. Indeed, it is at the basic definitional level that one of the core issues restricting the integration of research on creativity and innovation exists. Much debate has occurred in relation to definitions of creativity and innovation in their own distinct fields (see Flynn, Dooley, O’Sullivan & Cormican, 2003; Hennessey & Amabile, 1989; Marakas & Elam, 1997; Mumford and Gustafson, 1988).
While such definitional ambiguity persists, it is next to impossible to adequately define the relationship between creativity and innovation. Csikszentmihalyi (1997) suggests that one of the problems with the term creativity as it is commonly understood is that it 'covers too much ground' (p 25).

Adding to the confusion is that the terms innovation and creativity are often used interchangeably (Man, 2001; Ford 1996). At the basic definitional level, some believe that creativity produces innovation; others argue that innovation produces creative ideas (Man, 2001). In both creativity and innovation, newness or novelty is seen as a key distinguishing factor (Slappendel, 1996; Torrance, 1989; Hennessey & Amabile, 1989). However, innovation is intendedly adaptive, and it is undertaken typically in response to unfamiliar, unexpected or non-routine problems (Glynn, 1996). Creativity, in its purest sense, does not necessarily need to have a purpose. Amabile (1997) states that at its heart, creativity is simply the production of novel appropriate ideas in any realm of human activity. However, other researchers have defined it as the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive) (see Sternberg & Lubart, 1999), and it is this characteristic of being useful that provides the strongest link to innovation.

This emphasis on creativity as useful is evident from literature in the area of innovation also. In the past, the term innovative has sometimes been assigned to mean exclusively what is more generally called inventive or creative (Mohr, 1969). Sundgren and Styhre (2003) define innovation as ‘the implementation of ideas in practice within a project, team or domain of science… that was designed to benefit the objectives of the project’ (p 152). Similarly, MacAdam, Reid and Gibson (2004) define effective business innovation as the harnessing of creative ability within people and processes in an organisation, in
response to customer and market demands. These definitions again imply that innovation requires the implementation of creative ideas in a manner which is of value to an organisation's business demands, as well as to an organisation's technological or inventive demands.

A further aspect adding to definitional ambiguity is that different disciplines appear to invest different meanings to innovation and can have very distinctive understandings regarding the process and implications of the concept. Traditional innovation theories consider innovation as a radical act generated by the introduction of already known elements in a determined product (Schumpeter, 1934; as cited in Aranda & Molina-Fernandez, 2002). For the technological-economic paradigm, the innovation process emerges in the Research and Development (R&D) department, but in contrast, from a scientific basis (Aranda & Molina-Fernandez, 2002) or a marketing perspective, an innovative new product may be considered one that reduces the overall level of competition experienced within the market (Roberts, 1999). On the other hand, the entrepreneurship paradigm considers entrepreneurship as the main innovative process (Pinchot, 1985; Kanter, 1988a; Aranda & Molina-Fernandez, 2002).

The key difference between creativity and innovation is that innovation requires implementation (Man, 2001), adoption (Dammanpur, 1991, 1992; Glynn, 1996) and diffusion (Drazin & Schoonhoven, 1996; Hivner, Hopkins & Hopkins, 2003). Csikszentmihalyi (1997) suggests that creativity occurs in the interaction between a person's thoughts and a sociocultural context, and so is a systemic rather than an individual phenomenon. Furthermore, Amabile (1998) points out that in business, to be creative, an idea must also be appropriate, useful and actionable. She also suggests that creativity is the first step in innovation, which can then be seen as the successful
implementation of those novel, appropriate ideas (Amabile, 1997). This argument is furthered by Williams and Yang (1999) who suggest that successful ideas that gain legitimacy in organisations are those that are not only novel but also appropriate for the situation at hand and that can result in a high-quality product, thus enhancing the organisations innovative capacity also.

From the above literature, it appears that innovation may be seen as an application of creativity. Amabile (1997) states that creativity is the first step in innovation, which is the successful implementation of those novel, appropriate ideas. Zhuang, Williamson and Carter (1999) hypothesise that innovation is a combination of individual creativity and a creative organisational culture. Similarly, Majaro (1988) suggests that it is the interplay between individual creativity and environmental or organisational creativity that produces innovation. Others suggest that innovation encompasses creativity as a subset (Woodman, Sawyer & Griffin, 1993). Glynn (1996) hypothesises that creativity will result in innovation under a number of enabling conditions, namely, when there is opportunity for creative expression and an absence of constraints, when there is adequate resources and support to develop ideas, and when there are strong intrinsic incentives.

Rickards (1996) challenges what he calls the deep-rooted assumption that the innovation process exists as a phenomenon incorporating two distinct stages of creative discovery and subsequent implementation. He suggests an alternative perspective whereby innovation is represented as the process whereby individuals enact new social procedures; and creativity is the associated process in which the meanings of the enactments are discovered and labelled (Rickards, 1996). From this perspective, creativity continues as long as the innovative action continues (Rickards, 1996). Similarly, Fillis and McAuley (2000) point out that the discipline of marketing requires
creativity at all stages of the marketing cycle, which again, emphasises the need for creativity at all stages of the innovation process.

Thus, it is clear that, at the very least, creativity and innovation are intricately bound together and are closely related concepts. They share many common attributes, and some researchers use the term interchangeably. Many theorists regard creativity as the first step in innovation, but once the implementation stage begins, do not see a further role for creativity. However, Rickards (1996) perspective throws doubt on this assumption, as in his view creativity is required as long as innovation continues. In order to further research that integrates creativity and innovation, it is first necessary to have a common framework from which to examine them. The following sections examine both creativity and innovation at the micro (individual), meso (team) and macro (organisational) levels of analysis in a preliminary attempt to provide such a structure. Following this, a model which incorporates this framework is advanced as a tool that may guide future research.

The Micro (Individual) Level: the role of creative behaviour in determining innovation.

Creativity as Personality.

Tardif and Sternberg (1989) categorise descriptions of the creative person as typically falling into three categories, namely, personality and motivational qualities, cognitive characteristics, and special events or experiences occurring during one’s development. Early research on creativity generally attributed creativity to the person and led to genius views, whereby creativity was the remit of eminent individuals in society such as
scientists, poets, artists etc (see Guilford, 1987; Gardner, 1989, 1996; Gruber & Davis, 1989; Sternberg, 1989). Inquiry within the domain of creativity research was initially focused on understanding and recognising the characteristics associated with highly creative people, and identifying the states of creative process used by famous scientists, artists, and inventors (Isaksen, 2004). However, while such a view is still evident to some degree within research on creativity in the sphere of psychology (e.g. Feist, 1999; George & Zhou, 2001; Helson, Roberts & Agronick, 1995; Martindale, 1999), investigators of creativity have largely moved beyond this assumption.

The research on personality factor-creative behaviour relationships has tended to emerge in one of three ways:

1. Attempts by personality theorists to explain creativity in terms of comprehensive theories of personality. For example, theorists in the psychoanalytic tradition typically viewed creativity as stemming from the unconscious or preconscious, while theorists with a humanistic orientation would be more likely to relate creativity to the individual’s striving for self-actualisation (Woodman & Schoenfeldt, 1990). Such an approach is reflected in the work of MacKinnon (1965, 1969).

2. Investigations regarding the personality and biographical characteristics of eminent creative individuals and/or creativity activity in a variety of fields. These types of studies have attempted to catalogue correlates of creative productivity as well as biographical data that might be predictive of later creative behaviour (e.g. the work of Gardner, 1989, 1996, MacKinnon, 1992). Barron and Harrington (1981) concluded that a number of stable core characteristics were evident in the creative personality, having reviewed fifteen years of research in the area. These core characteristics included: broad interests, attraction to
complexity, high energy, independence of judgement, autonomy, intuition, self-confidence and a firm sense of self as creative, among others (as cited in Woodman & Schoenfeldt, 1990; p 282).

3. More narrowly focused work that examines one or a few specific personality dimensions for possible relationships to creative behaviour. Examples of heavily researched traits that have been related to creativity include locus of control, psychological femininity and masculinity, self-esteem or identity, dogmatism and narcissism (Woodman & Schoenfeldt, 1990). Furthermore, Sternberg (1989) suggests that people are creative by virtue of a combination of intellectual, stylistic and personality attributes.

The work of Guilford (1987) and Boden (1990, 1994) has been influential with regard to considering a cognitive perspective on creative personality. By linking multiple aspects of the creative person under his Structure-of-Intellect Model, Guilford (1987) considers the impact of personality traits, intelligence, cognitive styles, problem solving abilities, and behaviour. While this represents a significant advancement on the theories of creative genius, it was nonetheless limited by its exclusive focus on the individual and on stable traits.

Boden (2004) also conceives creativity as an aspect of human intelligence, grounded in everyday abilities such as conceptual thinking, perception, memory, and reflective self-criticism. Boden (1996, 2004) uses the term ‘conceptual space’ (defined as a style of thinking within a given domain) to describe cognitive dimensions within individual minds, and explains creativity in terms of mapping, exploration, and transformation of structured conceptual spaces. She investigates computer models of creativity by utilising concepts of AI to study creative thought, suggesting that computational modelling can help to
define a conceptual space, and to show how it may be mapped, explored and transformed, which Boden (2004) maintains are the three main types of creativity.

The cognitive characteristics that are shared by creative people, regardless of domain can be grouped into three classes: traits, abilities and processing styles that creative individuals use and possess (Tardif & Sternberg, 1989). In terms of traits, those more commonly associated with creative individuals are: relatively high intelligence, originality, articulateness and verbal fluency, and a good imagination. Numerous cognitive styles have been linked to creative persons, including; the ability to think metaphorically, flexibility and skill in decision making, independence of judgement, coping well with novelty, and logical thinking skills among others. Finally, some of the processing styles that have been said to characterise creative people include: using wide categories and images of wide scope, being alert to novelty and gaps in knowledge, questioning norms and assumptions and using their existing knowledge as a base for new ideas (see Tardif & Sternberg, 1989 for a review).

*Creativity as a Cognitive Style.*

A major advance in research looking at creativity and innovation at the individual level was the implication that creativity, rather than being a personality trait, or even a cognitive characteristic, may be viewed as a style. Relationships have been established between personality type and cognitive style (Isaksen, Lauer & Wilson, 2003), suggesting that this classification is not mutually exclusive. Cognitive style can be seen as one individual difference variable that may contribute to the concept of personality, and may be described as the manner in which individuals prefer to perform mental actions (Goldsmith, 1994). Creative style breaks away from identifying ability, level or
degree of creativity. Creative level refers to how much creativity an individual possesses or how well one uses creative capacity (Isaksen, 2004). By contrast, creative style refers to how people prefer to use their creativity with the emphasis being placed on modality, preference, propensity, manner or form (Isaksen, 2004).

Kirton (1976) first argued that individuals differ along a continuum in their preferences for styles of creativity, decision making and problem solving (Goldsmith, 1994). The contention of this theory is that everyone can be located on a continuum ranging from an ability to ‘do things better’ to an ability to ‘do things differently’, and each end of the continuum is labelled adaptive and innovative respectively (Kirton, 1976; p 622). The theory distinguishes between level and style of creativity and views creativity as a generalised attribute of every human being (Kubes, 1994).

Kirton (1976) contends that some people characteristically adapt while some characteristically innovate. Adaptors characteristically produce a sufficiency of ideas, based closely on, but stretching, existing agreed definitions of the problem and likely solutions (Kirton, 2001). Much of their effort to change is in improving and ‘doing better’ (which tends to dominate management) (Kirton, 2001). Innovators, by contrast, are more likely to reconstruct the problem in the pursuit of change, and emerge with much less expected and probably less acceptable solutions. They are less concerned with ‘doing things better’ than with ‘doing things differently’ (Kirton, 2001). Table 2 provides a summary of the main differences between adaptors and innovators.

Insert Table 2 here
The concept of innovation has become the synonym for technical progress and one of the main criteria for creativity (Kubes, 1994). Kirton offers a deep revision of this loosely defined concept. He abandons the traditional scheme ‘innovative = creative’ and ‘adaptive = non-creative’ (Kubes, 1994). People are creative regardless of their absolute position on the A-I (Adaptive-Innovative) continuum ranging from highly adaptive to highly innovative, and evaluation of the appropriateness of one of these styles can be found only in its specific context, in a particular situation (Kubes, 1994).

Adaption-Innovation theory has been linked to the adoption and diffusion of innovation (e.g. Rabson & DeMarco, 1999). Diffusion is generally described in terms of a five-stage model through which an adoption tendency within the individual develops over time from product awareness to product adoption (Kirton, 1994a). The connection between A-I theory and the adoption models of innovation is that the personality characteristic ‘innovativeness’, is attributed to those types who adopt relatively early to the diffusion process (Kirton, 1994a). In the area of consumer psychology, Foxall’s (1993) concept of an initiator, one class of consumer characterised by behaviour reflecting social and economic achievement (e.g. acquisition and consumption of status goods, and displaying products and services which signal personal achievement) can be likened to that of an innovator. Foxall (1993) describes initiators as risk takers who are eager to try an innovation for its own sake. In contrast, Foxall’s late adopters of new products have similarities to Kirton’s adaptors. Foxall (1993) describes the late adopter of new products as being more concerned with ‘getting it right’ (p 52) when they try new products, and hence exhibit caution and deliberation before deciding to try a new product. Such a characterisation of consumer behaviour as an evolutionary process that has its roots in behaviour analysis (see Foxall, 1999) provides a good example of the relationship between individual style and the innovative product.
A further measure of creative style has been recently developed by Selby, Treffinger, Isaksen and Lauer (2002). VIEW measures three dimensions of style relating to creative problem solving and change management (Selby, Treffinger, Isaksen & Lauer, 2004). These dimensions are firstly, Orientation to Change (with two general styles the Explorer and the Developer); secondly, one’s preferred Manner of Processing (External and Internal), and finally, one’s preferred Way of Deciding, (People-focused and Task-focused) (see Table 3). The Developer style has been found to correlate significantly with the KAI Adaptor style, as has the Explorer style with the KAI innovator style (Selby, Treffinger, Isaksen & Lauer, 2004).

The authors suggest that VIEW may be a useful tool for enabling individuals or groups involved in creative problem solving and change management to enhance their teamwork and planning for productivity (Selby, Treffinger, Isaksen & Lauer, 2004). Selby, Treffinger and Isaksen (2004) suggest a number of practical applications of VIEW which include the areas of improving problem solving, effective communication, enhancing personal productivity, providing and receiving feedback, group facilitation, change management, developing leadership, team building, coaching and mentoring, and designing instruction.

Each end of the creative style, whether drawing on Kirton’s distinction or that of Selby et al (2002, 2004) can be seen as polar ends of a continuum. Sternberg (1989) suggests that all styles represent a continuum rather than a discrete partition, and no one is completely dedicated to one style or another, and this is further reflected in the work or
McFadzean (1998b). Isaksen (2004) argues that the level-style distinction can be used to help clarify the characteristics associated with creativity. Firstly, the distinction may help provide an organising framework for sorting the creativity characteristics into more meaningful categories, resulting in an improved understanding of creativity in people. Secondly, it may also help to broaden our understanding of creativity to demystify the concept and validate or include a wider variety of creativity styles (Isaksen, 2004).

*Creative Behaviour.*

A further major advance in studying creativity at the individual level was to consider creativity as behaviour rather than a personality trait or style. Generally, researchers examining creativity at the individual level regard individuals as the building blocks of the organisation (McAdam & McClelland, 2002). Such research suggests that encouraging creativity at an individual level should result in improved creativity at the level of the group or organisation (McAdam & McClelland, 2002). Such an improvement in group or organisational creativity is then posited to improve or increase innovation.

Research looking at behavioural aspects shows little distinction between the terms innovative behaviour and creative behaviour (e.g. Mumford & Gustafson, 1988; Scott & Bruce, 1994). Indeed, the phrases creative behaviour and innovative behaviour appear to be used interchangeably, and the contextual and personal influences on creative behaviour and innovative behaviour appear to be largely overlapping (see Slevin & Covin, 1995; Tierney, Farmer & Graen, 1999). This research would suggest that the individual and contextual determinants of creativity in organisations are largely the same as the individual and contextual determinants of innovation. Such a conclusion would
provide strong support for the integration of research on creativity and innovation from any discipline in which it is studied.

Creative behaviour in the individual is likely to be determined by a complex interaction between the attributes of the individual and the attributes of the environment (Mumford & Gustafson, 1988). Hence, it is almost impossible to study creative behaviour without considering outside influences on a person’s behaviour. A person’s social environment can have a significant effect on that person’s level of intrinsic motivation at any point in time, and this in turn can have an effect on that person’s creativity (Amabile, 1997). Indeed, there is a need for a greater understanding of the dynamics between the personal and contextual factors responsible for creative performance in work settings (Tierney et al, 1999). Creativity in the organisational sense- ideas or actions deemed by relevant others to be sufficiently novel and useful- is not a frequently occurring phenomenon relative to the maintenance of the status quo (Dewett, 2004). Frohman (1997) maintains that most organisations do not foster conditions in which personal initiative can ignite change. Research suggests that employee intrinsic motivation, cognitive style, Leader-Member Exchange (LMX), the interactions between employee intrinsic motivation and leader intrinsic motivation, and between LMX and employee cognitive style relate to employee creative performance as measured by supervisor ratings, invention disclosure forms and research reports (Tierney et al, 1999).

Scott and Bruce (1994) took a social interactionist approach and hypothesised that leadership, individual problem-solving style and work group relations affect innovative behaviour directly and indirectly through their influence on perceptions of the climate for innovation. They viewed individual innovative behaviour as the outcome of four interacting systems- individual, leader, work group and climate for innovation, and their
model explained thirty seven percent of the variance in innovative behaviour. They found leadership, support for innovation, managerial role expectations, career stage, and systematic problem solving style to be significantly related to individual innovative behaviour. Team member exchange was not related to innovative behaviour or to climate perceptions in the study. In addition, innovative climate perceptions only mediated between leader-member exchange and innovative behaviour.

Insert Figure 1 here

Much attention has been paid to training individuals in creativity and creative problem solving techniques in order to improve organisational innovation. In particular, the development of methodologies aimed at deliberately nurturing creative thinking has been a major focus within the field of creativity (Puccio, Firestien, Coyle & Masucci, 2006). Creativity training has been posited to help employees view problems from different perspectives and generate new solutions (VanGundy, 1992). A variety of normative problem-solving processes have been proposed by researchers and practitioners in various fields of study (Evans, 1997), but one of the most popular is Creative Problem Solving (CPS), which grew out of the work of Osborn (1953) and is still undergoing revision and improvement, primarily by the International Centre for Studies in Creativity based in Buffalo, NY (see Isaksen & Treffinger, 2004). CPS is based on the systems approach to creativity, considering the person, product, process and press or environment (Miller, Vehar & Firestein, 2001). It is propelled by a balance of divergent and convergent thinking skills, and this balance is referred to as the ‘Dynamic Balance’ (Gonzalez, 2001). Puccio et al (2006) provide a review of previous research examining the effectiveness of CPS in the workplace, specifically demonstrating that it has an influence on individuals’ attitudes and behaviours among others.
The research outlined above, as well as other research in this area, suggests a certain circular reasoning in relation to creative/innovative behaviour and the context in which it occurs. It has been suggested that encouraging creativity at an individual level should result in improved creativity at the level of the organisation. However, research has also found that an organisation, which places the individual in an innovative environment (i.e. where support for innovative or creative behaviour is high due to managerial support, a creative climate, openness, job autonomy etc.) allows an individual to express innovative or creative tendencies which might otherwise be curbed. So it seems we need creative behaviour on the part of the individual to have an innovative organisation, but equally, an innovative organisation is needed in order to allow individuals to express their creative or innovative tendencies. It is conflicting conclusions such as these that highlight the necessity to integrate research from multiple disciplines.

From the review above, it is clear that the consideration of creativity and innovation at the individual level is important. However, the individual level of analysis on its own is not sufficient to explain many of the meso or macro accounts of creativity and innovation that will be examined in the forthcoming sections.

**The Meso Level: Team Creativity and Group Innovation.**

There is limited research on innovation and creativity in teams as distinct from the wider organisation or the individual (Anderson & West, 1998; West & Altink, 1996). However, groups can strongly hinder or promote individual creativity and the quality of individual judgement and solutions to problems (Nemeth, 1997). Teams are one of the basic building blocks of every organisation and according to Isaksen and Lauer (2002), they
may be considered the most important resource in any organisation after individuals. Furthermore, there has been an increasing use of teamwork in organisations seeking to increase flexibility and adaptiveness, to stimulate innovativeness and commitment to quality (Anderson & West, 1996).

Most attempts to raise the quality of group decision making and creativity have been aimed at diminishing the fears of social embarrassment and ridicule to encourage individuals to give voice to differing viewpoints (Nemeth, 1997). Expressing minority viewpoints has been promoted as an important aspect of effective groups and has also been found to stimulate divergent thinking (Nemeth, 1997). In addition, techniques such as Creative Problem Solving (CPS) that can be used by teams as well as individuals, advocates the generation of diverse and unusual ideas in the initial stages of identifying challenges and their solutions (Gonzalez, 2001; Miller, Vehar & Firestein, 2001).

Axtell et al (2000) confirmed an important link between individual (predispositional and job) factors, and the generation of ideas, whilst organisational and team factors emerged as more significant during their implementation. Garfield, Taylor, Dennis, and Satzinger (2001) suggest that group work may enable a company to benefit from using innovators (in Kirton’s (1976) terminology) to generate novel and paradigm-modifying ideas, and adaptors to help implement and incorporate these new ideas into existing work structures. In line with this, Kirton (1980) found that adaptors were more comfortable in departments of a company that must concentrate on solving problems which mainly emanate from within their departmental system (e.g. production) and innovators tend to be more numerous in departments that act as interfaces (e.g. sales, progress chasing).
West (2002) makes a distinction between team creativity and team innovation. In his view, creativity is the development of ideas while innovation implementation is the application of ideas. From this perspective, there is a difference between thinking about new things (creativity) and doing new things (innovation implementation). In this sense, innovation can be seen as incorporating both creativity and innovation implementation (West, 2002). West (2002) argues that creativity and innovation implementation represent two stages in the innovation process and that external demands have opposite effects on each of these stages, whereby external demands on the team inhibit creativity or idea generation, but encourage the implementation of creative ideas, or innovation implementation. He proposes a model of team innovation, which is affected by four groups of factors that will determine the level of group innovation:

- **Task characteristics**
  The task of a group performs a fundamental influence on the work group, defining its structural, process and functional requirements (West, 2002).

- **Group knowledge, diversity and skills**

- **External demands** (the external context of the group’s work, e.g. organisational climate, support systems, market environment or environmental uncertainty, that is likely to have a highly significant influence on its creativity and innovation implementation.)

- **Integrating group processes.**

West (2002) concludes that group members must individually and collectively develop the skills to work well as a team, encouraging integrating group processes to ensure that they innovate effectively. West and Altink (1996) suggest that where there are high levels of participation in teams, innovation is more likely to occur, one reason being the higher levels of communication and sharing of ideas.
Anderson and West (1996; 1998) developed the Team Climate Inventory (TCI) to measure the climate within a team for creativity, or to measure the group processes and climate for innovation. This inventory measures five factors of team climate; vision, participation safety, support for innovation, task orientation and interaction frequency (Anderson & West, 1998). As well as holding promise as a measure of group climate in organisations, the TCI also holds promise as a means for team building and organisation development interventions (Anderson & West, 1998).

Along similar lines, albeit serving a different purpose, Isaksen, Lauer, Ekvall and Britz (2001) and Isaksen and Lauer (2002) developed the Situational Outlook Questionnaire (SOQ) to examine the climate for creativity and change in teams. This measure grew out of the earlier work of Ekvall (1996, 1987), who developed the Creative Climate Questionnaire (CCQ), a measure of creative climate in an organisation. Ekvall (1996) considered climate as an attribute of the organization, conceptualised as a conglomerate of attitudes feelings and behaviours that characterise life in the organisation, and exist independently of the perceptions and understandings of the members of the organisation. Isaksen et al (2001) saw organisational climate as an aggregate of psychological climate (the recurring patterns of behaviour, attitudes and feelings that characterise life in the organisation). More specifically the climate for creativity and change is ‘that which promotes the generation, consideration, and use of new products, services and ways of working’ (Isaksen et al, 2001; p 172). Ekvall (1987) suggested that climate affects organisational and psychological processes such as communication, problem solving,
decision making, conflict handling, learning and motivation, and hence, also exerts an influence on the organisations ability to innovate.

The Situational Outlook Questionnaire is designed to assess nine aspects of organisational climate that either foster or hinder creative behaviour and organisational change (Lauer & Isaksen, 2002; see Table 4). All the dimensions, except for conflict, have been shown to foster a creative climate (Lauer & Isaksen, 2002). Results have shown that when subjects completed the SOQ based on their recollection of a best and worst case team experience, the measure is able to consistently and significantly discriminate between the two types of experiences (Isaksen & Lauer, 2002, Isaksen et al, 2001). Lauer and Isaksen (2002) also showed that the SOQ can be used to facilitate change initiatives and direct organisational change, and Isaksen et al (2001) developed a Model for Organisational Change, emphasising the factors that are important to consider when introducing, managing or understanding change within an organisation context, which draws on the work of the SOQ.

Insert Table 4 here

Research on the SOQ clearly highlights the involvement of organisational climate in the development of team creativity and innovation, and underscore, once more, the importance of considering multiple levels of analysis in the study of creativity and innovation. Furthermore, data from a study by Kazanjian, Drazin and Glynn (2000) suggest that individual creativity is greater within multi-functional sub-system teams on complex, long duration projects as compared to organisational approaches that isolate the functions from each other. Teams create an environment where individuals feel comfortable and motivated to engage in the creative process, and have access to the
skills and resources to pursue creative approaches and designs. Camelo-Ordaz, Hernandez-Lara and Valle-Cabrera (2005) looked at the effects of diversity on top management teams’ innovative capacity. Their findings indicated that certain types of diversity have a positive effect, while others a negative one. Diversity in Top Management Team (TMT) tenure had a negative effect, while functional diversity had an indirect positive effect on innovation in TMTs, as this occurred when there was a context of strategic consensus in the management team (Camelo-Ordaz et al, 2005).

It seems clear that the meso-level of analysis has much to add to the area of theorising in relation to creativity and innovation. The team level of analysis again highlights that creativity and innovation are inextricably linked, and also highlights the necessary interactions with the individual and organisational levels in order to gain an accurate perception of the processes at work at the team level. This level of analysis also highlights the multitude of other factors that need to be considered, for example, vision, participation, safety, task orientation, and attitudes toward change, among others. When looking at this level, noteworthy is the introduction of climate, and in particular team climate. Culture and climate are generally considered organisational level variables and tend to be studied from the perspective of their effects on individuals. It is important to note that culture also plays a role at the team or group level also, particularly in relation to creativity and innovation.

The Macro Level: Organisational Creativity as an area of convergence between the domains of creativity and innovation.

Attempts to increase innovation in organisations have been largely based on the belief that by increasing individual creativity, and by identifying and removing barriers to
individual creativity, organisations can increase their ability to respond to changes in the external environment (Csikszentmihalyi & Sawyer, 1995). However, the area of organisational creativity is opening new possibilities in relation to how creativity is conceived in organisations as well as in relation to the relationship of creativity to innovation.

Ford (1995a) contends that the most common, person-centred view of creativity has outlived its usefulness. Walton (2003) maintains that research into creativity has tended to suffer from the ‘fundamental attribution error’ (p 156) whereby creativity is searched for and measured solely within the individual with little concern for environmental or situational influences. While the capability of an organisation to become more creative must start at the level of the individual, individual creativity in itself is not enough (Andriopoulos, 2001). The next major step forward in understanding creativity generally and organisational creativity specifically, is to account for the influence of context on the origination, evaluation and realisation of creative actions (Ford, 1995a). Csikszentmihalyi and Sawyer (1995) maintain that organisational creativity, which emphasises social and group creative processes, is a key factor in future corporate success, particularly in industries with complex, changing business environments.

Woodman, Sawyer and Griffin (1993) define organisational creativity as the creation of a valuable, useful new product, service, idea, procedure or process by individuals working together in a complex social system. They frame organisational creativity as a subset of the broader domain of innovation, which is of itself characterised to be a subset of an even broader construct of organisational change (Woodman et al, 1993).
Organisational creativity is a function of the creative outputs of its component groups and contextual influences (organisational culture, reward systems, resources constraints, the larger environment outside the system etc.) (Woodman et al, 1993). An important aspect of this interactionist model of organisational creativity is its ability to address influences across levels of analysis, such as social and contextual influences. These cross-level influences are particularly important in identifying and understanding group and organisational characteristics that both enhance and inhibit creative behaviour in complex social systems. Andriopoulos (2001) outlines five key factors that affect organisational creativity, which link quite closely to the theory of Woodman et al (1993), and provide some support for the theory. The factors include: (i) organisational climate, (ii) leadership style, (iii) organisational culture, (iv) resources and skills and (v) the structure and systems of an organisation.

Insert Figure 3 here

From the research evidence, it is clear that individual differences in creativity are a function of the extent to which the social and contextual factors nurture the creative process (Woodman & Schoenfeldt, 1990). Individual creative behaviour is mediated through the group to influence organisational creativity. This mediational model may be conceived of as either the informal influences of the social context on individual behaviour or as the formal process of converting individual creative behaviour into group behaviour (Woodman et al, 1993).

Interactionist theories of creativity (Woodman & Schoenfeldt, 1990; Woodman et al, 1993; Ford, 1995; Drazin, Glynn & Kazanjian, 1999) have been linked to ecological models of creativity (Harrington, 1990; Isaksen, Puccio & Treffinger, 1993). Harrington
(1990) outlines a theoretical framework, grounded in biological ecology, within which studies of creative processes, people, and the environment may be connected more effectively. Harrington’s framework of the creative ecosystem incorporates four sets of factors:

i. The personal resources of the individuals centrally involved in the ecosystem’s creative activity, including cognitive skills, personalities and motivational dynamics.

ii. The distribution and complementary nature of those personal resources

iii. The resources residing in the remainder of the ecosystem that are relevant to creative activity.

iv. The functional relationships among the creatively active individuals and between them and the rest of the ecosystem’s resources.

If creativity is to occur, Harrington (1990) suggests that creatively active individuals and their ecosystems must initiate and sustain creative processes in the face of the powerful process-avoiding and process-terminating forces brought into play by uncertainty, fear of failure, intolerance of ambiguity and pressures for quick and certain results. Isaksen. Puccio and Treffinger (1993) also suggest that viewing Creative Problem Solving (CPS) from an ecological perspective has distinct advantages in developing a multi-dimensional framework to help understand, predict and facilitate CPS performance. However, these authors move beyond previous conceptualisations of an ecological approach by also including a task dimension, encompassing a general domain within which CPS is utilised, and a description of the desired outcome (Isaksen et al, 1993).

Interactionist and ecological theories of creativity have strong links to innovation and the management of innovation in organisations. Angle (1989) states that it is incumbent on organisations to create two broad classes of conditions to facilitate innovation- facilitating
conditions that allow people to innovate and motivating conditions that ensure people are willing to try to innovate. Furthermore, personal characteristics and context have co-
equal roles in bringing about innovative behaviour, and the interaction between people and context will result in outcomes not fully accounted for by people and context taken separately (Angle, 1989). Interactionist theories of organisational creativity, such as the one outlined above by Woodman et al (1993) may provide valuable templates for many managers and researchers seeking to manage or increase innovation in their organisation, and may also go some way to alleviating the circular reasoning outlined in the previous section. However, if the realms of creativity and innovation research are kept separate, such benefits cannot be taken advantage of.

Interactionist and ecological models also have strong links to Hurley’s (1997) analysis of scientific discovery. Scientific discovery can be said to occur when a scientific problem is solved, when a new technique is developed, when a more comprehensive theoretical explanation of existing phenomena is put forward, or when we come to the knowledge of new phenomena (Hurley, 1997; p 10). Importantly, discovery involves new and creative insights, and testing these insights in creative work (Hurley, 1997). In a sense, discovery can be likened to both the creative and innovative processes applied to the area of science. For example, Csikszentmihalyi (1997) links the concept of flow in creativity with the process of discovery. Hurley (1997) makes the point that the scientific process often emphasises individual genius, but for those involved in most science research, the role of the group and organisational factors can also have an important influence. Clearly, this reiterates the importance of future research considering multiple levels of analysis in research on creativity and innovation.
Hurley (1997) suggests that the process of discovery is likely to be the accumulation of knowledge and the combined input of members of the research group, and as such could be seen as a group/organisational achievement. Schaffer (1996) makes a similar argument, while also linking discovery to innovation. In a similar vein, Cohen and Levinthal (1990) demonstrated that organisational innovation is dependent upon the organisation’s knowledge base. For example, knowledge management literature is revealing an increasing importance of innovation in service firms where knowledge is turning into the main source of competitive advantage (Aranda & Molina-Fernandez, 2002). Mumford and Gustafson (1988) state that innovation is facilitated by an environment that provides a cognitive base for creative efforts through structures encouraging the creation of systematic understandings and ongoing exploration of alternative points of view. Thus, knowledge and information management has the potential to be a catalyst for innovation within organisations (MacAdam, Reid & Gibson, 2004).

The knowledge based view of the firm identifies the organisations intangible assets as the main source of competitive advantage in the firm (Massa & Testa, 2004). This viewpoint stresses that it is not the amount of knowledge existing at any given time that is important but the firm’s ability to effectively apply the existing knowledge to create new knowledge (Massa & Testa, 2004). Strategic innovation involves making knowledge creation and innovative action a way of life, seeking to create and expand markets rather than just reacting to customer demand, and redirecting resources from profitable but dwindling lines of business to support emerging lines that are potentially more profitable (Abraham & Knight, 2001).
Cohen and Levinthal (1990) state that prior related knowledge confers an ability to recognise the value of new information, assimilate it, and apply it to commercial ends. These abilities are termed ‘absorptive capacity’ (p 128) and may be developed as a by-product of a firm’s manufacturing operations, or firms may invest in it directly, for example, by sending personnel for advanced technical training. The premise of the notion of absorptive capacity is that the organisation needs prior related knowledge to assimilate and use new knowledge. This prior possession of relevant knowledge and skill is what gives rise to creativity, permitting the sorts of associations and linkages that may never have been considered before (Cohen & Levinthal, 1990).

An organisation’s absorptive capacity will depend on the absorptive capacity of its individual members (Cohen & Levinthal, 1990). Diverse knowledge structures coexisting in the same mind elicit the sort of learning and problem-solving that yields innovation. Assuming a sufficient level of knowledge overlap to ensure effective communication, interactions across individuals who each possess diverse and different knowledge structures will augment the organisation’s capacity for making novel linkages and associations - i.e. innovating - beyond what one individual can achieve. This perspective redirects attention from what is happening to the knowledge outputs from the innovation process to the nature of the knowledge inputs themselves (Cohen & Levinthal, 1990). Expressing the same concept from a knowledge based perspective, von Krogh, Ichijo and Nonaka (2000) introduce the term ‘knowledge activists’ as people who trigger and coordinate knowledge-creation processes (Massa & Testa, 2002), hence highlighting the constant balance researchers are striving to achieve between organisational and individual influences on innovation and creativity.
As stated above, the next major step forward in understanding creativity generally and organisational creativity specifically, is to account for the influence of context on the origination, evaluation and realisation of creative actions (Ford, 1995a). Research suggests that where employees work, how they are treated by supervisors and colleagues, the behaviour of leaders and what work they are asked to perform, affects their creativity in important ways (Cummings & Oldham,. 1997; Redmond, Mumford & Teach, 1993). Oldham and Cummings (1996) examined the independent and joint contributions of employees’ creativity-relevant personal characteristics and three characteristics of the organisational context—job complexity, supportive supervision and controlling supervision—to three indicators of employees’ creative performance: patent disclosures written, contributions to an organisation suggestion program, and supervisory ratings of creativity. Results found that participants produced the most creative work when they had appropriate creativity relevant characteristics, worked on complex, challenging jobs, and were supervised in a supportive, non-controlling fashion (Oldham & Cummings, 1996). Furthermore, findings of a later study by Cummings and Oldham (1997) found that individuals who scored more highly on a measure of creative personality only produced highly creative outcomes when they were surrounded by a context that facilitated their creativity, such as by having complex jobs and supportive non-controlling supervisors. This research also suggested that stimulating co-workers can also enhance employee creativity. This research clearly shows the importance of considering organisational and social influences on creativity and innovation.

Further support for this viewpoint is evident in the work of Meyer and Goes (1988), who found that in a hospital setting, innovation variables and contextual variables interact to influence the assimilation of innovations. The findings suggest that an organisation’s assimilation of a new technology is highly dependent upon attributes of the particular
innovation in which it is embodied, and upon attributes of the particular decision process in which it is aired (Meyer and Goes, 1988).

One important factor in the development, transfer and diffusion of innovation is a receptive political, economic, social and legal environment (Kanter, 1988b). This macro level of analysis is not common in the behavioural literature on innovation, but it needs more attention, particularly with respect to innovations that have organisational consequences (Kanter, 1988b). Ensley, Pearce and Hmieleski (2006) showed that environmental dynamism has a significant positive moderating effect on the relationship between transformational leadership and new venture performance, and a significant negative moderating effect on the relationship between transactional leadership and new venture performance. Dynamic environments are characterised by unpredictable and rapid change, which increases uncertainty for individuals and firms operating within them (Ensley et al, 2006).

From the research outlined in the above section, it is abundantly clear that there are many contextual factors which influence creativity and innovation in organisations, and it is important to consider them. They can affect whether individuals will attempt to be creative, and the ways in which innovation is approached from an organisational perspective. This has repercussions for the way that knowledge is managed in the firm, which in turn has strong links to the management of innovation. Support was also provided for the contention that organisational creativity, with its emphasis on interaction, may provide an integrating framework with which to view these multiple influences on innovation within the organisation.
Towards an Integrative Model of Creativity and Innovation in Organisations.

It is clear that creativity and innovation can no longer be considered as separate entities in research terms. Multi-disciplinary perspectives are needed in order to elicit common constructs between the two that may form the basis of models of innovation and creativity within organisations, that may more fully explain their relationships to each other and to further advance knowledge in the area of approaches to managing organisations, in order to foster both innovation and creativity in organisations. W/O psychologists have an important role to play in advancing research that integrates the fields of creativity and innovation. Making such a contribution to multidisciplinary research will also highlight the contribution that W/O psychologists can make in the wider business and scientific arenas.

Figure 4 proposes a model for the integration of creativity and innovation in the study of organisations, technology and science. Inherent in this model are four propositions for the integrative consideration of creativity and innovation. The propositions are as follows:

1. Creativity and Innovation can be thought of as processes, working concurrently, which can be engaged in at the individual, team, organisational or industry level (P1).

2. As one moves from the individual level, to the team level, to the organisational level, and finally to the widest level of analysis (industry), the primary focus shifts from creativity, at the individual level, to innovation at the industry level (P2).

3. The organisational level of analysis provides the researcher with the greatest opportunity to study innovation and creativity in tandem with one another (P3).
4. The processes of innovation and creativity at all levels are influenced by individual factors, team factors, task characteristics, support factors, organisational factors and external demands (P4).

Insert Figure 4 here.

This review has considered creativity and innovation at multiple levels of analysis, namely the micro (individual), meso (team) and macro (organisational) levels. While it is clear that research is justified at each of these levels, it is evident from this review that research which considers each of these levels independently is not sufficient. It is at the interface between these levels where many of our questions will be answered. The propositions outlined above aim to serve as an aid to guide future research attempting to integrate the study of creativity and innovation in an organisational, technological or scientific context. Far from suggesting a definitive solution to the problem of integrating the concepts of creativity and innovation, it is suggested that these propositions may serve as a first step towards advancing research in this vein, and may provide guidance and direction for future research in these areas.

In particular, the study of organisational creativity appears to be one of the most promising areas for such an integration (see Proposition 3). Research on organisational creativity, by definition, should focus on multiple levels of analysis (Andriopoulos, 2001). Creativity can be promoted by conscious efforts to break the habitual processes people adopt in organisations, by encouraging different ways of thinking and approaching problems (Ford, 1995b). A complete psychology of organisational innovation needs to address not only motivation, information processing and creativity, but also needs to look at the implementation problems of obtaining compliance through persuasion, bargaining,
incentives and power relations with others both within and outside the innovation unit (Angle, 1989). The study of organisational creativity may provide a forum which can incorporate divergent literature pertaining to individual creativity and organisational innovation.

**Conclusion**

It is clear from this article that innovation is not confined to individual creativity per se, but to the novel application and implementation of ideas by groups within the organisations context (Searle & Ball, 2003). A central issue for organisation’s who value innovation is, therefore, how to select, develop and motivate individuals capable of formulating ideas in the first place, and also to create the supportive environment in which groups can productively and swiftly implement them (Searle & Ball, 2003). Such issues are prime examples of areas where W/O psychologists can make a valuable contribution.

Traditional approaches to thinking about, researching and influencing creativity are based primarily on identifying factors that either facilitate or constrain creative behaviours (Ford, 1995a). The implicit assumption is that if one can somehow remove the blocks to creativity, then the natural talents that most people possess will blossom (Ford, 1995a). However, such an approach ignores the probability that even in the most favourable circumstances, there are likely to be familiar options available that are relatively more attractive based on their past success, ease and certainty. In order to be undertaken, creative actions must hold a competitive advantage over old, familiar actions (Ford, 1995a). Such issues again highlight the need for research that integrates the
multiple levels outlined in this article, in order to devise successful methods to overcome barriers to creativity and innovation in organisations.

Measurement of innovation management appears to be undertaken infrequently, in an ad hoc fashion, and relies on dated, unbalanced or under-specified models of the innovation management phenomenon (Adams et al, 2006). Majaro (1988) states that very few companies explicitly measure or audit their levels of creativity and innovation. Equally, few managers know how to enhance the level of creativity in their organisation, nor how to manage innovation in a methodical way (Majaro, 1988). These issues suggest that a large part of the contemporary conceptualisation of the innovation management phenomenon is overlooked in practitioner’s measurement practices, and so, opportunities for more efficient and effective management of the innovation process are not realised (Adams et al, 2006).

This article has outlined a model which may be used as a guide to furthering the integration of research in creativity and innovation. It is imperative that such research be undertaken in order to (a) further advance knowledge which may aid organisations in developing both individual, team and organisational creativity and innovation, which will in turn, increase a company’s competitive advantage and (b) advance the usefulness of research undertaken by W/O psychologists in these domains to business and technology.
References


Isaksen, S.G. & Lauer, K.J. (2002). The Climate for Creativity and Change in Teams. *Creativity and Innovation Management, 11*(1); 74-86.


Table 1. Examples of existing contradictions in the study of innovation and creativity.

<table>
<thead>
<tr>
<th>Area</th>
<th>Creativity</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Creativity does not need a purpose in its purest sense. However, in business an idea must be useful and appropriate, if it is to be creative.</td>
<td>Innovation is adaptive and it is undertaken typically in response to unfamiliar, unexpected or non-routine problems.</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Creativity is needed in all steps of the innovation process.</td>
<td>Creativity is the first step in innovation</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>Creativity is the remit of the individual</td>
<td>Innovation is the remit of organisations.</td>
</tr>
<tr>
<td><strong>Relationship</strong></td>
<td>Creativity produces innovation</td>
<td>Innovation produces creative ideas</td>
</tr>
<tr>
<td><strong>Determining factors</strong></td>
<td>Individual creativity is needed for an innovative organisation</td>
<td>An innovative organisation is needed to foster individual creativity</td>
</tr>
<tr>
<td><strong>Teams</strong></td>
<td>Creativity in teams is thinking about new things.</td>
<td>An innovative organisation is needed to foster team creativity</td>
</tr>
</tbody>
</table>
Table 2. Behaviour descriptions of adaptors and innovators (Adapted from Kirton, 1976, Kirton 2001).

<table>
<thead>
<tr>
<th><strong>Adaptor</strong></th>
<th><strong>Innovator</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerned with resolving problems rather than finding them</td>
<td>Could be said to discover problems and discover avenues of solution</td>
</tr>
<tr>
<td>Seeks solutions to problems in tried and understood ways</td>
<td>Queries problems concomitant assumptions; manipulates problems</td>
</tr>
<tr>
<td>Reduces problems by improvement and greater efficiency, with maximum of continuity and stability</td>
<td>Is catalyst to settled groups, irreverent of their consensual views, seen as abrasive, creating dissonance</td>
</tr>
<tr>
<td>Is an authority within given structures</td>
<td>Tends to take control in unstructured situations</td>
</tr>
<tr>
<td>Challenges rules rarely, cautiously, when assured of strong support</td>
<td>Often challenges rules, has little respect for past custom.</td>
</tr>
<tr>
<td>Is essential to the functioning of the institution all the time, but occasionally needs to be ‘dug out’ of systems</td>
<td>In the institution is ideal in unscheduled crises, or better still to help avoid them, if he/she can be controlled</td>
</tr>
</tbody>
</table>

*When collaborating with innovators*: supplies stability, order and continuity to the partnership

*When collaborating with adaptors*: supplies the task orientations, the break with the past and accepted theory.

Provides a safe base for the innovator’s riskier operations

Provides the dynamics to bring about periodic radical change, without which institutions tend to ossify.
Table 3. VIEW: Breakdown of styles (from Selby, Treffinger, Isaksen & Lauer, 2004).

<table>
<thead>
<tr>
<th>VIEW style</th>
<th>Style Category</th>
<th>Explorer</th>
<th>Developer</th>
</tr>
</thead>
</table>
| **Orientation to Change** | Explorer       | - an individual who thrives on venturing in uncharted directions, seeks to break new ground, and follows adventurous or promising new possibilities wherever they may lead.  
- do not fear risk and uncertainty. | - an individual who brings tasks to fulfillment, who begins with the basic elements or ingredients and then organises, synthesises, refines and enhances them, forming or shaping them into a more complete, functional, useful condition or outcome.  
- concerned with practical applications and the reality of the task.  
- use their creative and critical thinking in ways that are clearly recognised by others as being helpful and valuable. |
| **Processing**       | **External**    | - individuals who draw their energy from interaction with others, discussing possibilities, and building from their ideas with others.  
- prefer physical engagement with the environment.  
- when learning new and difficult material, clarify their ideas and understanding through discussion.  
- Seen by others as good team members. | **Internal**  
- Individuals who look reflectively to their own inner resources and draw energy from their reflection.  
- prefer to consider ideas on their own before sharing them with others.  
- embark on action only after giving it careful consideration  
- emphasis quiet reflection and processing information at their own pace.  
- prefer learning privately, working at least initially without the help of others. |
| **Deciding**         | **Person-focused** | - individuals who first consider the impact of choices and decisions on people's feelings and support, and on the need for harmony and positive relationships.  
- prefer to be emotionally involved when setting priorities.  
- are often seen as warm, friendly and caring.  
- often quick to become aware of, and to respond to, the needs of others. | **Task-focused**  
- individuals who tend to look first at choices and decisions that are logical, sensible and can be justified objectively.  
- prefer making decisions that are impersonal, based on well-reasoned conclusions.  
- seek mastery of content or information to help them arrive at the best solution or response.  
- may stress the need for staying cool and free from emotion, while seeking clarity, precision and logical order. |
Fig. 1. Scott and Bruce’s (1994) hypothetical model for determining innovative behaviour.
Fig. 2. West’s (2002) Model of Team Innovation and Group Processes.
Fig 3. An Interactionist Model of Organisational Creativity. (Adapted from Woodman et al, 1993).
Fig. 4. A model for the integration of creativity and innovation