

PROOF

Group Creativity and Innovation

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Chapter outline

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Chapter objectives

The main objectives are to:

- describe innovation as a cyclical process and the role that creativity plays in it;
- identify the factors that influence creativity at work and innovation by referring to the individual, group and organizational level of analysis;
- explain how group processes enable or inhibit individual employees from using their creative potential to address issues at work;

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- examine the different techniques available to stimulate creativity in the workplace;
- critically evaluate the contribution of brainstorming to organizational creativity.

Introduction

Many observers have noted how quickly the world of work is changing. This has, and will, continue to occur for various reasons, including economic, technological, legal and social change. To survive, organizations have to change and adapt to new circumstances. To thrive, they have to be the tireless adaptors and innovators on new products, processes and approaches. Thus, we have examples from 'low-cost cultures' where innovations on the part of a few people have fundamentally changed the whole industry. Innovations constantly ask why things are done in a particular way and whether they may be done differently – faster, cheaper and more simply.

All innovations, such as new programmes, products, or services, begin with creative ideas produced by a person or a group of people and then are successfully implemented with the aid of wide resources within organizations (Amabile et al., 1996).

Organizational creativity and innovation have become critical means of competitive advantage in various industrial sectors since they allow organizations to adapt and develop in a rapidly evolving environment. The innovations may be in terms of products as well as organizational processes. A number of well-known management innovations exist, such as Total Quality Management (TQM) and team-based work, that are frequently adopted and further developed by organizations to promote efficiency. Innovations seem to change managerial cognitions on what actions are possible and beneficial, and thus allow organizational change to occur (Greve & Taylor, 2000). However, one should note that although innovation is a precursor for organizational change, organizational change is a broader construct since much of organizational change is not innovation. For example, mergers are often related to major changes in organizational functioning but innovation is not a necessary element of these changes.

It has been suggested that there are cultural, ethnic and gender differences in creativity which are attributable in part to social forces and processes (Kaufman, 2009). The question remains as to how, when, where and why these processes operate. This chapter examines innovation and creativity in the workplace by focusing on the interaction between employees working in group settings. Employees' individual characteristics, tasks properties, group socio-psychological traits and the context of the larger organization are regarded as basic elements of this interaction reflected in group processes. The dynamics of coordination and

motivational considerations in group performance, group decision-making, and conflict and negation raised in previous chapters provide a foundation for issues analysed in this chapter.

The concepts of innovation and creativity

The competitive economic environment forces organizations to show interest in the generation and application of new products and practices so that they survive and prosper. The introduction of new and improved ways of doing things at work is called innovation (West, 2002). It involves the creation, as well as the implementation, of useful new ideas, products, material artefacts, services or procedures. Ideas for reorganizing, improving communication, or assembling products in teams are seen as examples of innovation (Kanter, 1983). Researchers have proposed that there are distinct types of innovation, such as technological versus administrative innovations (Damanpour, 1991) or evolutionary versus revolutionary innovations (Zaltman et al., 1973).

Basadur (2005) believes that creativity in the work place involves three related processes: problem finding, then problem solving, then solution implementation. This is much more than simply generating ideas but involves few processes: anticipating problems, sensing and seeking better solutions; problem definition with fledgling solution ideas; systematic analysis and evaluation of the ideas generated; followed by the efficient and effective implementation of these ideas. Especially important is the management and maintenance of the process after the change has been implemented. Thus, 'applied creativity' is seen as a never-ending circular activity of generating creative options to new problems, conceptualizing the best solutions, optimizing the best ideas and practice and then implementing these to create successful change. It may well be, as Basadur believes, that different groups at different levels may be better suited to these different functions. Thus very senior people may be a lot better at conceptualizing while supervisors or technical specialists may be better implementers.

An often-cited definition of innovation is 'the intentional introduction and application within a role, group or organisation of ideas, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organisation or wider society' (p. 9; West & Farr, 1990). There are three characteristics of innovation that appear in the above definition. The first attribute of innovation is 'novelty' which can be either absolute (something totally new) or relative (something new to a specific unit of adoption, but already well-known and implemented). The second attribute is an 'application component' which refers to innovation not only as the generation of ideas but also to their implementation. The third aspect of innovation is 'intentionality of benefit' which distinguishes innovation from serendipitous change. It is planned and purposeful.

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Box 4.1 Creativity and innovation at work

Brilliant ideas are clearly not enough in the business world. They need to be translated into practical actions, processes, or products. Most people think of business creativity as new product development, but equally important is process innovation and structural change. It may be equally important to innovate one's relationships with clients, suppliers, etc., or how the organization goes about strategic planning. Sherwood (2001) has identified 12 points worth considering (or debating against) on creativity and innovation:

- Creativity is about bright ideas; innovation is about the wisdom in identifying the commercially viable ones and bringing them to fruition.
- Innovation applies to all aspects of business activity, including how one manages.
- Everybody, irrespective of their level of creativity, can contribute to the business of innovation.
- People can learn the tools and techniques than enhance the process of creativity and innovation.
- People innovate better in groups. Innovation requires the coordination of many organizational resources.
- Some organizational cultures are better suited to innovation than others, being better at the deployment of teams and the promotional process.
- The heart of business creativity is searching for new patterns in existing patterns and components.
- Innovation never (or very rarely) starts from a Greenfield/blank-sheet start.
- Paradoxically, the core of much innovation is not learning new habits but rather unlearning familiar habits.
- The innovative, unlearning organization adopts a slow, deliberate process involving a great deal of time, energy, leadership and effort.
- Innovation organizations make time for, and work at, innovative processes.
- Innovative, unlearning organizations really do have unassailable, ultimate, competitive advantages.

Many of these points may be disputed. What is beyond dispute, however, is that all organizations have to adapt and innovate and that being the first with a really good idea offers considerable benefits.

West and Farr (1990) developed a four-factor theory to describe and explain the process of innovation in organizations. These factors are:

1. Vision: A higher-order goal, which acts as a motivating force. It helps establish goals that are clear, valued, attainable and shared, as well as difficult to achieve.
2. Participant safety: The fact that the environment is interpersonally non-threatening because people can influence decisions and fully share information.
3. Task orientation: An emphasis on accountability, evaluating and modifying performance, on feedback, cooperation, monitoring, improving.
4. Support for innovation: Support is both articulated and enacted in terms of time, money and assistance.

If these four factors are in place it means the group is likely to seek for, accept and implement innovative ideas and practices.

Similarly, organizational creativity has been defined as the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system (Woodman et al., 1993). Organizational creativity is, therefore, a subset of the broader domain of innovation since innovation may involve creativity at the ideation component of the innovative process. Moreover, even in the case of applying well-known and widely implemented innovations, creativity might be a necessary factor for these innovations to be adapted to a specific organizational context. For instance, setting up quality circles in an organization for the first time is an innovation since it is a new practice to the unit of adoption. It certainly does not involve the generation of a new idea, as quality circles are already widespread, but creativity might be called for when putting this innovation into practice. Indeed, idea implementation may call for as much creativity as initial idea generation (Mumford et al., 2002).

Amabile (1988, 1996) argues that individual and small-group creativity is the most crucial element in the process of organizational innovation because the ideation component of organizational innovation depends on the generation of new ideas by individuals or small groups.

One important issue concerns whether determinants of, and the process involved in, creativity are different in different areas like arts, business, commerce, or science. Second, is the question whether creativity as an ability or trait or process is normally distributed in the population as a whole, or highly skewed such that only a very few are highly creative.

Yet, creativity remains problematic; mainly because of how to decide whether a person, invention, work of art or science *is truly* creative. The question is: who makes the judgement and to what extent do they have to agree before one can say 'it' is a real manifestation of creativity? Criteria could be based on patent awards, judgements made by professionals, social recognition or even sales. Different groups have different criteria and different levels of reliability.

For the scientist the whole enterprise hardly gets off the starting blocks. If one cannot adequately, robustly and reliably describe the criteria or label the product it remains particularly difficult to understand the process.

Essentially, it seems that researchers have adopted one of four approaches to the problem:

1. *The creative person*: differential psychologists have attempted to delineate the particular and peculiar set of abilities, motives and traits that together describe the creative individual.
2. *The creative process*: this is an attempt to understand the thought (cognitive) processes that go on in the process of creativity. It is not so much an attempt at the 'who', but the 'how' question.
3. *The creative situation*: social and work psychologists are particularly interested in cultural, environmental and organizational factors than inhibit or facilitate creativity. The idea is that one can therefore construct situations that induce creativity even in the not particularly creative.
4. *The creative product*: this approach attempts to study all aspects of creativity by looking at those products that are clearly defined as creative.

This chapter will elaborate on these approaches to creative activity and particularly focus on how it may be in practical terms possible to enhance creativity in groups at work.

Innovation is often considered to be a cyclical process that involves two stages: creativity or idea generation and innovation implementation (West, 2002; see Figure 4.1). Creativity is the generation and development of new and useful

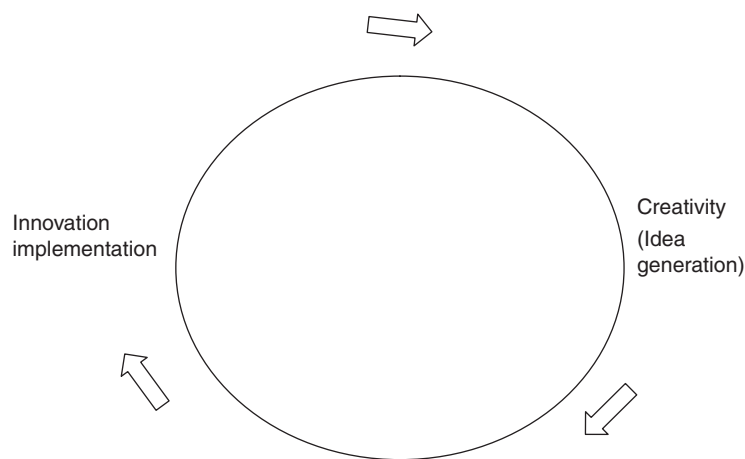


Figure 4.1 Innovation represented as a cyclical process (after West, 2002).

ideas, whereas implementation is putting these ideas into practice. For instance, a group of engineers employed by a chemical company may make a discovery over a new material that allows the electricity to run faster. This scientific discovery can be implemented in manufacturing a number of new appliances and eventually reach the market for consumer consumption.

Researchers exploring innovation have recognized that idea generation is one stage of a multistage process on which many social factors have an effect (Scott & Bruce, 1994). Creativity takes place at the early stages of the innovation cycle when a new product, process or idea is formulated but it may also be necessary when new or adopted ideas are put into practice. Creative ideas need to be adapted, introduced and stabilized in an organizational setting for the innovation cycle to run smoothly. Therefore, acceptance of new ideas, as well as their application and implementation are central to the definition of innovation. Innovation has a clear, social and applied component since it impacts directly or indirectly upon others affected by the role, or others in the work group and the organization, as, for example, in the case of administrative innovations. This necessary applied social component perhaps most sharply distinguishes it from creativity (West & Farr, 1990).

It is important to note that the stages of creativity and innovation implementation are reciprocally interdependent (West, 2002). On one hand, innovation implementation is dependent upon the quality of the creative ideas initially developed and, on the other, the application of innovations may create a need for more creative ideas to deal with unanticipated problems that arise during bringing the initial idea into use. For example, a new product team may decide to test the quality of the new product they designed by establishing direct relationships with customers. The feedback received from their customer base, in turn, calls for more creative ideas to address the needs of customers.

In sum, innovation is a multistage process of developing and applying new and useful ways to do things at work. Creativity plays a central role in the innovative process especially when innovation is characterized as an absolute rather than relative novelty. However, creativity may also be necessary in the case of applying well-known innovations to a new unit of adoption since putting relatively tested ideas into practice can be very challenging.

Factors affecting organizational creativity and innovation

As already noted, there are a number of factors that have been identified in the relevant literature as predictors of creative thinking and innovative behaviour. Different perspectives on whether one should put emphasis on the process of creating a novelty or on the creative product itself have provided various predictors of creativity. The process versus product criterion issue concerns the thinking about of creativity either as a cognitive ability of the general population or as an exceptional real-life creative achievement. Within the creativity as a process perspective the study of creativity has predominantly focused on the personality traits which influence creative behaviour, the knowledge and

the mental processes on which creative thinking is based, as well as the role of intrinsic motivation – viewing task engagement as interesting and involving – in facilitating creative performance.

Woodman et al. (1993) have argued that although one should advocate moving well beyond a focus solely on individual factors, theorists must nevertheless retain an appreciation for the creative person as a partial explanation for creativity in complex organizational settings. They have put forward a widely cited interactionist model of organizational creativity, in terms of which, cognitive and personality characteristics of the individual interact with important social-contextual variables in formulating creative and innovative behaviour at work. In other words, antecedent conditions influence the cognitive and personality traits of individuals, and to some extent they probably determine the current situation in which the person finds himself or herself. That is, creative people choose to work in particular organizations and with particular groups. Nevertheless, social pressures toward conformity may reduce allowable variation in idea generation when organizational members try to find solutions to problems they face at work.

Finally, one should note that even though research on the factors that affect organizational creativity and innovation is ample, there is a gap in the literature as to whether there are differential predictors of certain creativity and innovation phases (Rank et al., 2004). Future research needs to pay attention to this issue, as well as to whether different creativity-enhancement techniques are more beneficial for the creativity and innovation implementation phases.

Cognitive abilities and personality factors

A fundamental question in creativity research has been whether creativity is related to intellectual ability. Accumulated research has shown that moderate rather than high levels of IQ are necessary for creative accomplishment. Moreover, it has been demonstrated that the intellectual ability of providing several responses to a specific prompt, that is divergent thinking (DT), is associated with creative thinking rather than the cognitive ability to perform well in ability tests requiring one correct answer, which is convergent thinking. In an early study Wallace (1961) showed that saleswomen exhibiting high customer service obtained significantly higher mean scores on DT tests in comparison to saleswomen with low customer service. However, critics of the DT tests as predictors of creativity have argued that DT skills cannot differentiate between moderately and highly creative individuals and, therefore, can be considered only as a very partial explanation of creative behaviour.

Within the cognitive approach to creativity researchers have also studied the knowledge and the mental processes on which creative thinking is based (Mednick, 1962; Ward et al., 1995). Domain-specific knowledge and expertise are a precursor of creative achievement. In fact, as knowledge combination is inherently difficult, creative people usually spend many years studying a specific domain to be able to combine knowledge in a creative manner. Deep understanding of knowledge, rather than information scanning or exposure,

has been shown to increase performance in innovative teams (Taylor & Greve, 2006). Various cognitive styles, such as the ability to suspend judgment, using widely inclusive categories, and breaking out of perceptual or cognitive frames, seem also to facilitate the generation of creative ideas and accomplishment.

Besides the effect of cognitive abilities and styles on creative performance, researchers have also explored the personality traits that characterize creative people. Some of the traits frequently held to be related to creative achievement are a tendency to be independent, high tolerance of ambiguity and complexity, and propensity for risk-taking (Child, 1973; MacKinnon, 1965). In the personality domain, there is a growing consensus that personality is comprised of the Big Five factors, namely, openness to experience, conscientiousness, extraversion, neuroticism and agreeableness. Research on the relationship of the five factors of personality with creative performance has shown that neuroticism is a creativity predictor in artistic populations (Feist, 1998) but successful, and possibly creative, managers and leaders are emotionally stable (Barrick & Mount, 1991; Salgado, 1998). Openness to experience seems to enhance creative behaviour in particular when it is combined with positive feedback and unclear means in doing one's job; moreover, high conscientiousness may inhibit creative behaviour when the situation encourages the conformist and controlled tendencies of employees who are high on conscientiousness (George & Zhou, 2001).

Based on research findings to date one can draw the recommended profile for a creative employee as follows: moderate to high IQ, high scores on DT tests and the ideal combination of personality traits (Batey & Furnham, 2006). However, one should keep in mind that intellectual abilities and personality factors interact with other important variables, such as task characteristics, intrinsic motivation, group composition and processes, and contextual influences stemming from the larger organization to produce creative accomplishments and innovation.

Furnham (2008) concluded:

It seems, therefore, that there is no doubt that certain personality traits are important for explaining and predicting certain types of creativity. This may account for as much as one quarter to one third of the variance in explaining the causes of creative work. However, most personality studies have assumed that underlying personality traits are domain general. This approach has resulted in mixed evidence concerning which personality traits are important in what circumstances. As suggested, possessing certain traits, such as openness to experience or tough-mindedness (psychoticism), is probably necessary but not sufficient for creativity as achievement. To ensure that a person fulfils his or her potential, other requisite cognitive and situational variables will need to be present.

(p. 204)

Task characteristics

Task characteristics that enhance employee creativity include having a sense of autonomy or control over doing the job and viewing the work as challenging and significant (see also Chapter 2 on the effectiveness of work groups). Specifically,

complex and challenging jobs characterized by high levels of autonomy, skill variety, identity, significance and feedback are expected to support and encourage higher levels of motivation and creativity than are relatively simple, routine jobs (Hackman & Oldham, 1980). For example, Oldham and Cummings (1996) investigated creativity among 171 employees from two manufacturing facilities where creativity was assessed by patent disclosures written, contributions to an organization suggestion programme and supervisory ratings of creativity. The findings showed that complex and challenging jobs were related to these indices of creativity, as well as supervisory support for new ideas, particularly for those employees who had a personality disposition towards creativity. Ideally people prefer jobs with high autonomy and control but with few demands. These are usually the best for encouraging creativity and innovation, though relatively few in number.

On a practical level, the design of jobs may contribute to employees' intrinsic motivation and creative performance at work (Amabile, 1988; Hackman & Oldham, 1980; Oldham & Cummings, 1996) by making the numerous tasks performed within a certain organizational role as challenging as possible. However, various jobs have different creativity requirements and managers should – if they can – design and monitor work environments to ensure that the creativity levels required by a job matches the structure of the existing work environment (Shalley et al., 2000).

Similarly, work groups are more likely to develop ideas, and implement new and improved products, services and procedures, when they are autonomous – that is, they are relatively independent work units that have control over task performance (West, 2002). The tasks performed by autonomous groups are characterized by (1) completeness, which enables group members to identify with their own products, and (2) interdependence, as the various tasks performed by group members are expected to be related in content. Therefore, West proposes that the extent of group autonomy and the task requirements of completeness, varied demands, opportunities for social interaction, and opportunities for learning and development will predict group creativity and innovation implementation.

Task complexity and autonomy or having control over doing one's job are characteristics of an organizational setting that promotes intrinsic motivation and creative performance. Managers and organizational consultants should design jobs in such a way that employees have control over the means and ends in carrying out their jobs, and feel excitement and intrinsic interest in performing their duties. This is of course not always possible. Jobs differ in regard to the extent that they demand the use of a variety of skills and their significance or completeness; however, even for simple and routine jobs managers can ensure that the various tasks performed within a role differ in terms of complexity.

Intrinsic motivation

Creative performance is influenced by the levels of intrinsic motivation people exhibit towards doing their job. Intrinsic motivation is motivation to perform

a task for the pure love and joy in the activity. On the other hand, extrinsic motivation is doing a job for a specific reward such as money. Amabile and her colleagues (Amabile, 1996; Amabile & Gitomer, 1984; Amabile et al., 1990; Hennessey & Amabile, 1988) have actually articulated the intrinsic motivation principle of creativity which suggests that an intrinsically motivated state is conducive to creativity, whereas an extrinsically motivated state is detrimental. People are considered to be intrinsically motivated to engage in a particular task when they view their task engagement as interesting and involving. On the other hand, people are said to be extrinsically motivated to engage in a task if they perceive their task engagement as directed primarily to external goals, such as evaluation and rewards.

Box 4.2 The creativity maze

To understand the differences between intrinsic and extrinsic motivation, imagine a work problem as a maze.

One person is motivated to make it through the maze as quickly and safely as possible to get a tangible reward, as, for example, money. This person looks for the simplest, most straightforward path and then takes it. If she is in a real rush to get that reward, she might just get the most well-known path and solve the problem exactly as it has been solved before. She follows the path that others have found to lead to the exit.

That approach, based on extrinsic motivation, will indeed get her out of the maze. But the solution that arises from the process is unlikely to be creative or imaginative. It won't provide new insights about the nature of the problem or reveal new ways of looking at it.

Another person actually finds wandering around the different paths to be fun and intriguing. No doubt, this journey will take longer and include mistakes because any maze has many more dead ends than exits.

But when the intrinsically motivated person finally does find a way out of the maze – a solution – it is very likely that it will be more interesting than the rote algorithm. It will be more creative and original.

Source: Adapted from Amabile (1998).

Research has demonstrated the detrimental effect of a number of social constraints, such as, competition, reward, surveillance, evaluation and restricted choice in task engagement, on the levels of creativity through the mechanism of intrinsic motivation (Amabile, 1996; Amabile, & Gitomer, 1984; Amabile, Goldfarb & Brackfield et al., 1990; Amabile, Hennessey, & Grossman et al., 1986; Hennessey & Amabile, 1988). However, there are empirical studies showing that competition does not always have a negative effect on creative performance depending on individual differences in achievement motivation

(Epstein & Harackiewicz, 1992), awareness of conflict in experts (James, Chen, & Goldberg ~~et al.~~, 1992), and perceptions of masculinity (Conti, Collins, & Picariello ~~et al.~~, 2001). Moreover, Eisenberger and Armeli (1997) have persuasively argued that reward can be conducive to creative performance when there is an explicit requirement for novel performance, or an established positive relationship between creativity and reward. It seems that extrinsic motivators can have a positive effect on intrinsic creative interest and performance when they lead individuals to view activities as more challenging and provide competence valuation (Amabile, 1996; Csikszentmihalyi, 1990; Harackiewicz & Sansone, 1991; Sansone & Harackiewicz, 1996).

Creativity is promoted when individuals perceive tasks as interesting and stimulating, which, in turn, is determined by task complexity, reward, competition, surveillance and/or restricted choice. The design of work environments advances creative behaviour when individual employees think of their jobs as something that is challenging and can potentially verify their competence in dealing with their external environments.

Group composition and processes

There is a widespread belief among practitioners that organizations can promote innovation successfully by bringing together organizational members with different professional backgrounds to work in a team. For example, people from engineering-manufacturing, marketing and finance may be chosen to formulate a new product development team. The idea is to get people out of their disciplinary-specific silos into mixed, matrix management groups. Functional diversity entails differences concerning knowledge, skills and abilities, as well as values, beliefs and attitudes. West (2002) points out that the challenge is to create sufficient diversity within the team without threatening their shared view of the task and their ability to communicate and work effectively together. He proposed that innovation is promoted by requisite knowledge diversity – that is, the amount of knowledge diversity necessary for task performance and to create variety in, and flexibility of, cognitive responses. However, when diversity begins to threaten the group's safety and integration, innovation will suffer.

~~Gebert et al.~~ (2006) have noted that functional diversity management poses a dilemma. On the one hand, cross-functionality is needed for innovations; on the other hand, it may obstruct cooperation and communication within the team, which, in turn, impairs innovation. They have argued that without taking contextual conditions into account, one should not expect a positive, but rather a nonsignificant association between cross-functionality and team innovations.

Besides functional diversity, ethnic, cultural and gender differences in organizations are thought to help employees cultivate new ideas by drawing on a larger pool of information and valuable experiences. A diverse force of skilled employees are equipped with the necessary competences and life experiences to generate and implement original and useful ideas, and, by doing so, to promote creativity and innovation. Take, for example, a group of product designers who

work on finding solutions to improve a wide range of consumer products, such as computers, children's toys or kitchen appliances. A diversified and skilled staff can more adequately address the needs of a diverse customer base to which this wide range of products are marketed.

In practice, there are corporations that have diversity departments that operate on the basis of fostering diversity in the organization. These departments aim at enhancing organizational performance via understanding and valuing differences among groups of employees in the organization, which are actually thought to reflect the cultural, ethnic and gender differences of the society. However, even though it's a widespread belief – some call it a human resource fad – that organizational diversity enhances innovation, the psychological mechanisms that enable demographic, as well as functional, diversity to be beneficial to innovation are not well investigated and understood. This type of knowledge can help us address the important question, set at the beginning of this chapter, as to how, when, where and why this diversity facilitates innovation.

What we are in a position to suggest is that the quality of processes taking place in groups is an important moderator of the relation between diversity and innovation. For groups to have the ability to utilize individual creative resources effectively, as in the case of managing functional diversity, it is important that they exhibit high-quality group processes. High-quality team processes are characterized by:

- *Shared vision* (Fay et al., 2006; Pearce & Ensley, 2004): The pursuit of goals and objectives that are appealing and felt to be worth pursuing by the team.
- *Teamwork behaviour* (Pearce & Ensley, 2004; Taggar, 2002): The ability of team members to organize and coordinate themselves together to accomplish tasks.
- *Intra-group psychological safety* (Baer & Frese, 2003; Edmondson, 1999; Fay et al., 2006; West, 2002): A personally nonthreatening work environment in which group members trust each other's intentions.
- *Regard for personal identity* (Gebert et al., 2006; Taggar, 2002): The appreciation of different ideas, viewpoints and needs, as well as the belief that expressing individuality is a positive thing.
- *Support for innovation* (Scott & Bruce, 1994; West, 1990): A psychological climate of support for innovation embracing flexibility, encouragement and tolerance of change.

Therefore, group processes seem to moderate the relationship between placing creative people in a group and the creative output produced by it. In particular, high-quality processes are the conditions that enable creative people to flourish within a team. For example, Taggar (2002) showed that when group members were inspired to elevate their goals, contributions were coordinated and there was individualized consideration for each member of the team, response novelty was high. Similarly, Fay et al. (2006) found that multidisciplinary teams in

the health care sector produced higher-quality innovations when members had a strong vision, worked closely together and there was a safe team climate. Moreover, De Dreu and West (2001) showed that minority dissent was associated with team innovation under high levels of participation in decision-making.

In conclusion, even though it is necessary for innovation that groups contain members who are creative, it is also important that teams operate under the conditions that enable the creative people to use their talents. Indeed, without the right sort of social context the benefits of putting together a group of highly creative individuals can be neutralized.

Organizational level factors

At the organizational level of analysis research investigates the effects of the larger organization on creativity and innovation. The importance of organizational structure has been emphasized (Nystrom, 1979) and the structural properties of functional differentiation, specialization, and internal and external communication were shown to be positively related to innovations, while centralization was negatively correlated with innovative behaviour (Damanpour, 1991). The notion of the 'innovation dilemma' suggests that the structural variables of formalization, centralization and complexity possibly have a detrimental effect on innovation at the early stages of the process (e.g., idea generation), but promote innovation at the implementation stage (Zaltman et al., 1973). Moreover, regarding the association between innovation and organizational size, the existence of a significant positive correlation was confirmed in the case of service teams (Camisón-Zornoza et al., 2004).

Besides structure, there are aspects of organizational climate or culture that have been shown to promote or inhibit innovation/creativity. Psychological climate perceptions of support for innovation were positively related to innovative behaviour (Scott & Bruce, 1994) and the climate dimensions of achievement motivation and risk-taking were also found to be positively related to creativity and change (Nystrom, 1990). The relation between process innovation and organizational performance was shown to be moderated by organizational climates for initiative and psychological safety; that is, only companies with a high degree of process innovativeness and high levels of climates for initiative and psychological safety did better than those companies that did not innovate (Baer & Frese, 2003).

A supportive culture that values individual creativity and achievement has been identified by a number of sources to be a facilitator of innovative behaviour (Amabile, 1988; Amabile et al., 2010; Cooke & Rousseau, 1988; West & Anderson, 1992; Xenikou & Simosi, 2006). Organizations that encourage their members to take risks, not to be afraid of failure and to set their own goals are characterized as highly innovative environments. Moreover, innovation is promoted within a cooperative social environment in which team work flourishes and open communication is perceived as a necessary factor for individual and organizational growth. Competition *can* be a conducive factor to innovation

mainly when it is manifested at an inter-organizational level (between companies), while internal competition can lead to an uncontrollable conflict within the organization hindering members perception of the organization as an entity with certain common goals.

Sherwood (2001) believed that business innovation is all about corporate culture. Some organizations welcome innovation: they have the time, money and will to do it. They know they need to revisit all sorts of issues on a regular basis: rewards and recognition, performance management, funding and budgeting arrangements. They understand about managing innovation products and embedding the process. They certainly know about the crucial role of senior management and how to reward innovation. However, most organizations are the opposite. Their problem is not so much the introduction of new ideas as the unlearning of old ones. They are reactive not proactive, full of hubris rather than humility; risk and failure averse; against things new; quick to judge and punish innovations.

In sum, attributes of the larger organization can be crucial determinants of individual and group creativity at any point in time. Centralization of power (the concentration of decision-making authority) has been shown to inhibit innovation as it decreases organizational members' awareness, commitment and involvement, whereas functional differentiation, specialization, and internal and external communication promote innovative behaviours. Organizational culture and climate have been introduced as important intervening factors affecting the outcome of innovation strategies; climate and culture dimensions of initiative, psychological safety, achievement and risk taking, cooperation and open communication were shown to be related to innovations.

Creativity-enhancement techniques

Groups are extensively tasked by particular organizations to stimulate creative thinking among their employees. There are various creativity-enhancement techniques that groups in organizational settings can apply to stimulate the generation of novel ideas. Some creativity-enhancement techniques encourage group members to view the problem from a different angle by breaking cognitive mindsets, whereas others do not necessarily provoke a radical shift in perception (McFadzean, 2001). For example, techniques that use stimuli unrelated to the task at hand are more likely to produce novel ideas than techniques that use related stimuli.

Brainstorming

In brainstorming organizational members are asked to generate new ideas in groups of a rather limited number of people. Group members are encouraged to provide as many ideas as possible without concern for quality. They are also instructed to avoid criticizing or evaluating ideas as they are presented, namely

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the no-criticism rule, and to build on the ideas generated by others in the group (see case study X).

Hicks (1991, p. 50) has described a number of ground rules for encouraging creativity in groups. These are as follows:

- Welcome every idea no matter how wild it is – it has some merit. If nothing else, it will fire our imagination or someone else's imagination.
- Hold back on criticizing an idea – remember that it is difficult enough to get an idea past our self-censor, so don't be too quick to criticize somebody else's idea. And make sure you understand another person's idea before you evaluate it.
- Remember that we always have some knowledge or experiences that can help us solve a given problem.
- Don't be afraid to indulge in some childlike behaviour – as in wishing, imagining, mental playfulness etc.
- Never forget that other people perceive problem situations in ways different from you – treat this as an advantage, a way of helping you establish the most appropriate one to work with.
- Always think of a mistake or failure as an opportunity to learn, not as a thing we did wrong. If we just forget about it we could do it again!

Even though brainstorming is a very popular technique among managers and business consultants for stimulating creativity in groups at work, the research literature has shown that group interaction seems to inhibit the sharing of novel ideas (Diehl & Stroebe, 1987). Groups using the brainstorming rules generate substantially fewer ideas than the same number of individuals producing new ideas in isolation. Researchers have suggested that this productivity loss might be attributable to (1) the fear that group members experience of their ideas being negatively evaluated by their peers (i.e., evaluation apprehension), (2) the difficulty of simultaneously listening to the ideas of others and thinking of one's own ideas (i.e., production blocking) and (3) the tendency of people to put less effort in carrying out a task when they work in group settings (i.e., social loafing). On these grounds it has been argued that idea generation may be best left to individuals, whereas the selection and implementation of high-quality ideas may be a task better performed in groups (Nijstad & De Dreu, 2002).

However, individuals brainstorming in groups often report that they have lots of fun trying to find new ways to improve their jobs. Moreover, Paulus and his colleagues (Paulus et al., 2000; Paulus & Yang, 2000) have recently argued that people generating ideas in group settings seem to experience a condition of cognitive stimulation, which actually facilitates the generation of a higher quantity and quality of novel ideas. For this cognitive stimulation to take place it is important that group members are given the opportunity to generate additional ideas on their own afterwards, in a subsequent session, following the group brainstorming session.

Other procedural techniques that have been developed to overcome the limitations of group brainstorming have focused on exchanging ideas by writing instead of talking. These techniques are usually referred to as 'brainwriting' and aim at limiting the production blocking that occurs in brainstorming groups. Writing instead of speaking facilitates the generation of novel ideas because group members have the opportunity to choose when to attend to the ideas of others. Therefore, group members are not required to perform the rather demanding task of attending to the ideas of others, building on these ideas and simultaneously generating their own ideas. Finally, brainstorming is also performed in 'electronic brainstorming groups' in which case the interaction among group members is taking place through computers eliminating any oral communication among the interacting parties. All the procedural techniques presented above also deal to some extent with the problem of evaluation apprehension people most likely experience in brainstorming groups since ideas generated by group members are kept anonymous.

Other creativity-enhancement techniques

Brainstorming and brainwriting use free association by encouraging team members to build on and further develop the ideas that other participants present to the group. Therefore, the stimulation of ideas tends to rely on the group members' past experiences or the immediate environment. There is another creativity-enhancement technique called forced association that requires group members to coerce two or more elements together. These elements may or may not be related to one another or to the problem. McFadzean (1998) describes a forced association technique named 'object stimulation':

- The problem statement is developed and written down.
- The group members are asked to develop a list of objects that are completely unrelated to the problem.
- Each individual then selects one object and describes it in detail. The group uses each description as a stimulus to generate new ideas.
- The facilitator writes each idea down.
- This process continues until each group member has described an object or until each object has been described.
- The ideas are then related back to the problem and developed further.

For example, McFadzean describes the use of object stimulation when the group has formulated the problem statement as follows. How can we attract more customers to our car dealership? After the problem statement is developed, an object is chosen that is completely unrelated to the problem. In this case, the board game Monopoly is chosen. The object is described by group members

and these descriptions are used as stimuli to generate novel and valuable ideas on how to attract more customers.

Another method to stimulate creativity described by McFadzean (1998) is called 'rich pictures' and uses a form of expression other than just verbal or written language:

- Group members are asked to write a brief statement of the problem.
- The facilitator then asks each individual to draw two pictures. The pictures may be a metaphor of the situation (e.g., a vehicle or an animal). The first drawing would be a picture of how each participant would like to see the situation in the future. The second picture would be a drawing of how the participants see the present situation.
- Each participant is asked to describe the picture of the present first. Not only should he or she describe the picture but a description should also be given of the properties of the objects drawn and why they have been drawn that way. Next, a description of the picture of the future should be given. Again, the properties and the relationships of the objects should be described.
- From the descriptions given by the participants new ideas can then be generated.

The generation of novel and useful ideas in groups can offer great satisfaction and enjoyment to individual employees. However, it is important that group leaders or facilitators make the necessary amendments so that the quantity and quality of ideas produced in organizational groups are as high as possible. Various creativity-enhancement techniques deal with the production loss observed in brainstorming groups by creating the conditions which act as stimulators for creative thinking. It should be noted that the essence of a good idea is that it is both new and useful. Some creative techniques seem to throw up interesting but essentially impractical ideas.

Summary

Creativity has been described as the foundation of innovation and a key to organizational effectiveness. Innovation is considered to be a cyclical process encompassing the search for new ideas, products, practices and processes (creativity), as well as their implementation. Indeed the implementation of creativity products may call for as much creativity as their initial generation.

The creative employee, characterized by expertise, knowledge, divergent thinking and a unique combination of personality traits, is a partial explanation for creativity in work groups and complex organizational settings. The challenge is to provide a work environment that enables employees to flourish and realize their creativity potential in full capacity. The design of jobs supports creative thinking and behaviour when employees are given autonomy and control over the means to do their work, tasks are being perceived as a challenge,

and team members have the opportunity to verify their personal competencies. The management of cultural and functional diversity entails high-quality group processes – such as a common vision, organizing and coordinating team work, trust, regard for personal identity and support for innovation. Moreover, the size and structure of the organization has an impact on organizational creativity and innovation – that is, larger decentralized organizations with functional differentiation and specialization are more innovative. Finally, Baer and Frese (2003) point out that for innovations to be successful there is a need to develop organizational climates in which people participating in the changing process feel safe in taking interpersonal risks, are encouraged to propose new ideas, openly discuss problems and proactively approach work. In Part II of this book, we will further examine the interplay between organizational culture, as well as climate – reflected in value priorities, behavioural norms and expectations – and innovative behaviour.

On a practical level, there are various creativity-enhancement techniques that managers and business consultants may use to facilitate creativity among organizational members. Brainstorming is a well-known and widely implemented technique encouraging the free flow of new ideas and cooperation between team members on generating solutions to problems in a noncritical environment. Other creativity-enhancement techniques, such as object stimulation and rich pictures, try to fire the imagination by using unrelated stimuli or drawing pictures.

Box 4.3 Tactics of leaders to promote a culture of innovation

While there is reason to suspect that leaders shape climate and culture, less research is available examining how leaders should behave to ensure a culture and climate likely to support innovation.

The following tactics can be used by leaders to encourage innovation via culture perceptions:

- Exhibiting involvement, intellectual stimulation and idea support.
- Seeking to recognize and reward people who have exhibited both creative output and the pattern of interactions known to promote creativity (e.g., risk taking, collaboration, challenging others' ideas)
- Telling stories about past accomplishments involving creativity and innovation
- Approaching crisis as an intellectual challenge by accepting risks and seeking for creative solutions
- Framing mundane decisions in terms of the impact of these decisions on openness, trust and challenge

Source: Adapted from Mumford et al. (2002).

Questions

1. What is the relationship between innovation and creativity? In your experience, is the originality of new ideas closely associated with their successful implementation?
2. Is creativity necessary for innovation to take place?
3. Innovation is considered to be a multistage process. Which are the main stages of the innovation process and how do they feed each other?
4. What factors influence the extent to which groups generate and implement ideas for novel and useful products, services and practices at work?
5. Should groups be used in the creativity phase of innovation? Describe some techniques that can facilitate idea generation in group settings.
6. Under which conditions do demographic diversity and cross-functionality have primarily positive effects on team innovations?
7. How can managers stimulate and encourage creativity among their subordinates?

Window on the workplace

Innovation in a product development firm

IDEO is a product design consulting firm specializing in mechanical engineering and industrial design. Clients typically hire IDEO to design part or all of a product that they would like to manufacture and sell but lack the expertise of staff levels to design.

Engineers at IDEO use brainstorming sessions to address product design problems that they face. Sessions usually last between 45 minutes and 2 hours. Typically, project engineers introduce the project and describe a design problem that troubles them. Then the other engineers offer possible solutions, often in the form of solutions they have seen in other settings. Solutions are sometimes found in similar products that are brought to brainstorm (e.g., a designer suggested adapting a design solution for a new skin stapler that was already used in a competitor's product) or in products that were brought in from different industries (e.g., a designer showed how a gas engine from a model airplane could be used to power a skin stapler). The topics of the brainstorming sessions range widely concerning video cameras, furniture, personal appliances, surgical skin staplers, blood analysers, laptop computers, remote controls, vacuum cleaners, and portable traffic control systems. Five brainstorming rules are displayed in large letters in several locations in each room: (1) defer judgment; (2) build on the ideas of others; (3) one conversation at the time; (4) stay focused on the topic; and (5) encourage wild ideas. Engineers often describe and sketch solutions on paper or on whiteboards in the room.

(cont'd)

Designers at IDEO make connections between existing solutions and new problems over time and across people. There are routines that designers and teams use to create new products by teaming of possible solutions, remembering them, and retrieving them in new forms that fit in new combinations.

Source: Adapted from Hargadon and Sutton (1997).

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Chapter 4

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