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Learning cultures for sustained innovation success

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In this conceptual paper, we expose learning cultures that contribute to firms' sustained success in innovations. The learning cultures we propose are based on the cultural theory proposed by Mary Douglas. We argue that different learning cultures have different preferences for modes of learning: the hierarchical learning culture prefers internal knowledge creation; the competitive learning culture learns through external knowledge transfer and the egalitarian learning culture learns through debates and discourse. We argue that, owing to their inherent characteristics, each learning culture will be more effective at different stages of the innovation process: the hierarchical learning culture will come to the fore during the radical phase of the innovation process, the competitive learning culture will be more effective during the incremental phase and the egalitarian learning culture will outshine the other two during the transition period between the radical and incremental phases. Finally, we propose that firms that support different learning cultures during different stages of the innovation process in the sequence that we outline in this paper will enjoy sustained success in innovations. Managerial and theoretical implications are also discussed.

Keywords: innovation; radical phase; incremental phase; learning cultures; cultural theory; sustained innovation success

Introduction

Workplace learning and innovation have been among the main focus areas for academics and researchers in human resource development for the past few years. Past researchers (e.g. Hurley and Hult 1998) have suggested that organizational learning leads to innovation. Hence, organizational learning is an important organizational development intervention in order to transform organizations (see Cummings and Worley 2004, Marsick and Watkins 1994, McLean 2006). Argyris and Schon (1996) point out that organizational learning is important in today's knowledge economy and usually involves different ways of perceiving, thinking and behaving in organizations. Past literature emphasizes the importance of learning in organizations, yet very few studies have discussed how individuals collect, absorb and transform information into organizational memory and knowledge (Lien et al. 2007). Although growth and sharing of knowledge are recognized as the most important elements in becoming a learning organization (Easterby-Smith and Araujo 1999, Marsick and Watkins 1994, Senge 1990) the field of organizational development has few explanations for how people learn and perform in an organization (Raybould 1995, Salisbury 2001).

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Encouraging and sustaining an environment of learning and innovation has been a challenge for firms and HR managers. Current literature relating HR practices and innovativeness of firms (e.g. Shipton et al. 2006) is sparse and has not focused on cultural dynamics as an influencing factor. Although HR managers acknowledge the need to develop and implement specific HR strategies in order to encourage learning and innovation in their teams (see Carmen and Cano 2006), the results from their efforts are far from satisfactory. Recent ASTD reports (ASTD 2006) state that training expenses per employee in the United States has consistently increased in past years. Yet it is unclear whether this training contributes to enhanced innovative capabilities of firms. In this paper, we hope to provide suggestions to HR managers regarding the focus of their training programs in order to make their firms more innovative than competing firms and hence, more successful in the long run.

Learning, culture and innovations

Although past literature admits that learning and innovation contribute to firms' long-term growth (see Yang et al. 2006), it offers little insight into cultures that facilitate learning and innovation. Culture has been frequently evoked in past studies, especially those in the field of international business, at the corporate and national levels. In such instances, corporate culture is often treated as a "given" (see, e.g., Hofstede 1991, Trompenaar and Turner 1997). In other words, a company is believed to have a unique and homogenous culture which makes it distinct from another company and which dictates behavior. Other researchers (e.g. Sathe 1985, Deshpande et al. 1993, Boisot 2000, Kapferer 1972, Patel 2005) have expressed dissatisfaction with this concept of one overarching corporate culture. Boisot (2000) offers four different kinds *information cultures* that co-exist in firms despite their differences and their rivalry. We support this line of thinking and believe that treating a firm as a homogenous entity might have led past researchers to over-simplify the inherent complexity of the learning and innovation process in these firms. In this paper, we aim to overcome this limitation. We intend to expose four kinds of learning cultures and the role they play during each phase of the innovation process.

The idea of exploring the link between culture and innovation is not new in itself. Recent research has linked corporate culture (Tellis et al. 2006) and even national culture (Herbig and Dunphy 1998) to innovations. Other recent work has highlighted the importance of the internal culture of the firm in determining the success or failure in innovation in varied fields, including sustainable development (e.g. Reece 2007, Baungartner 2007). Yet there is evidence that this area deserves more attention (see Moynihan 2005). As mentioned earlier, most past studies on culture and those linking culture to learning and innovation have addressed culture as a function of geo-ethnic boundaries of nations, societies, corporations and other similar entities (see, e.g. Hofstede 1991, Trompenaar and Turner 1997, GLOBE et al. 2002). Unlike past studies, we attempt to go beyond this geo-ethnic divide. We use the Douglasian cultural theory (referred to hereafter as CT), which treats culture as transactional. We believe that cultures can be created and recreated through active social interactions at the micro, meso and macro levels. The use of CT therefore differentiates our paper from past research on the topic of innovations and culture. Basing our premise on CT, in the following section we propose that there are four learning cultures in every firm. We explore these four learning cultures to answer the following research question: *what kind of learning cultures should HR managers encourage during different stages of the innovation process so as to facilitate sustained innovation in their firms?*

Introducing CT and learning cultures

In the past, culture has been variously described "as a set of values that an individual grows up with" (Hoecklin 1993) and as the "software of the human mind" (Hofstede 1980 [1984 revised version]). This conventional approach to culture treats it as a residual category, an explanation of the last resort that is dragged in only when other explanations have failed (Schwarz and Thompson 1990, see also Patel 2005, 2007a, 2007b). Unlike those scholars who consider culture as a "given" (see also Hoecklin 1993, Schein 1985, Child and Faulkner 1998) or as a residual category, we treat culture as transactional and central to every area of social interaction. Further we believe that by exposing the link between underlying values of different cultures and their actions, we can find a way of making sense of people's actions in a complex chaotic world. This approach, called cultural theory (CT), was pioneered by Mary Douglas (1970, 1978) and then developed by other cultural theorists such as Gross and Rayner, (1985), 6 (2003, 2004), Wildavsky (1987), Thompson (1992, 1996), Rayner (1995) and many others.

Mary Douglas (1996) defined culture as the way people live together. A cultural type sustains a particular arrangement of social relationships, which is either supported or challenged by other arrangements. This implies that cultures are not static, nor are they linked to countries, customs, myths, races or ethnicities. Instead, they are ways of life, which are continually tested for social viability (Thompson and Wildavsky 1986). One of the highlights of CT is that it resolves the issue of scales (see Thompson 1996). Cultural theorists argue that if a theory of culture is a good one then what it says should apply to the national level, the corporate level, even individual and/or international levels. Hence, we believe that our use of CT to explore learning cultures in companies can offer valuable insights for other kinds of social entities.

Douglas (1970) classifies cultures on two social dimensions: group and grid. The horizontal group axis represents the extent to which people are restricted in thought and action by their commitment to a social unit larger than the individual. Further, the vertical axis, grid, is a composite index of the extent to which people's behaviors are constrained by role differentiation, whether within or without membership of a group (Gross and Rayner 1985). Douglas's (1970) consideration of high and low strengths of these two social dimensions (i.e. grid and group) gives rise to four learning cultures.

Hierarchical learning culture (high grid–high group)

This culture is tradition-bound. Members know their place and that place might vary with time. Security is valued over opportunities for competition and social mobility. Hierarchy implies both compulsion and inequality (Gross and Rayner 1985). Roles are status-based and those with a superior status are treated with deference. Tight rules and restrictions characterize hierarchy (Coyle and Ellis 1994). Hierarchies are process-oriented and are more concerned with who does what rather than the outcome (Schwarz and Thompson 1990). This culture is also long-term oriented (see Douglas 1978). As Schwarz and Thompson (1990) point out, modern hierarchies are biased towards large-scale high-technology approaches that demand much specialized knowledge and centralized direction. Creating specialized knowledge is a time-intensive exercise and hence suits the long-term orientation of the hierarchical learning culture.

Consider the example of a university reputed to be one of the top educational institutions in the country. Such an institution would generally employ only individuals who have the appropriate qualification, have graduated from top-ranking schools and have

an impressive educational background. Standards are important and individuals not meeting those standards would not be entertained. Further, roles of employees would be clearly defined and there would be a higher emphasis on procedures and the right person doing the job rather than with the outcomes. Specialists or experts would be assigned to do specific jobs. Specialization would be encouraged and rewarded. Promotions and reward systems would be based on achieving set standards. This kind of learning culture encourages its members to invest in specialized knowledge. Cultivation of specialized knowledge obviously is a time-consuming process. Hence the institution would be long-term in its focus and planning. Opportunities beyond those planned for would be seen as disruptive and would not be welcome. These characteristics are very different from those of the competitive learning culture.

Competitive learning culture (low grid–low group)

This kind of learning culture allows maximum options for negotiating contracts or choosing allies. This culture is characterized by individual spatial and social mobility. The past is irrelevant and group affiliations are weak. All boundaries are provisional and can evolve subject to negotiation (Gross and Rayner 1985). Entrepreneurship and individual flair are valued by this culture (Mars 1982). Members of this culture are less doctrinally inclined and more pragmatic (Schwarz and Thompson 1990). Hence, they would align themselves with whatever developmental path offers them the best financial prospects in the immediate future. Therefore, unlike the hierarchical learning culture, the competitive learning culture is short-term in its focus.

Consider here the example of privately-owned schools that, unlike universities, depend on student recruitment rather than government grants for their survival. Such institutions would generally appreciate people who have an established performance track record rather than those with qualifications and reputation.[1] Entrepreneurial flair and innovative ideas will be appreciated rather than degrees and qualifications. Being pragmatic and less doctrinally-inclined, this learning culture will appreciate and reward innovative, entrepreneurial individuals who can produce results for the institution fast. Reactivity and quick thinking will be appreciated rather than long-term thinking. This kind of learning culture will be more supportive of short-term pragmatic ideas promising to improve financial results rather than time-consuming exercises producing non-tangible outcomes (e.g. training programs leading to specializations). Employees' roles will be easily interchangeable and focus will be on the outcome rather than who does the job. An individual's network will be considered an asset because more contacts implies more possibilities of allies and partnerships.

Egalitarian learning culture (low grid–high group)

In this culture the external group boundary is the dominant consideration, while all other aspects of interpersonal relationship are ambiguous and negotiable (Gross and Rayner 1985). This kind of culture is by definition small, face-to-face in interactions, and many-sided in its relationships. Participatory decision-making is common, members share beliefs and values and are held together by virtue of a network of reciprocal exchanges (Douglas 1986). The limitation of this culture is that it is not tenable as the group grows larger. Internal fights lead to schism and break-up of the group. The strength of this culture is its critical abilities. Rayner and Malone (1999) point out that this culture is the societal canary and is the first to raise warning signs of impending danger in the face of change. It

encourages social discourse and facilitates interaction between the two opposite cultural types: hierarchical and competitive, thereby preventing gridlocks (see Patel 2005).

An appropriate example of the egalitarian learning culture would be that of a small research laboratory. Since such a small unit would involve few members, it is possible to envisage frequent face-to-face interactions between its members. Within the laboratory, relations would be egalitarian. Any attempt to create a hierarchical order within such a structure would be resisted. Although there would be no clear leader, leadership could be attributed to those that best represent the interest of majority members of the group. If the organizational structure demands a leader to be appointed, the leader would feel obliged to underplay the leadership role because emphasizing a hierarchical position would create inequality which would be resisted by such a learning culture. Rewards would be equally shared among all members. Deviance from the commonly-shared group norms would result in expulsion. New candidates will gain membership only when existing members approve the candidate based on a commonly-decided set of criteria. Participation in decision-making, sharing of responsibilities and collaborations on projects would be common. Members of the research unit would learn from one another by collaborating on various projects and through formal and informal interactions. Furthermore, the egalitarian culture in the research unit would facilitate open communication and discussions, which would facilitate learning. Finally, members would have a high level of cohesiveness and would distinguish themselves from those who do not belong to the laboratory. Any indication of threat to one member would be seen as a threat to all. This indicates a high group sentiment.

Fatalist learning culture (high grid–low group)

This is an environment in which peoples' behaviors are strongly regulated according to their socially assigned classifications. These situations often emerge when people in strongly hierarchical structures have been excluded from decision-making or when, in a competitive context, they have been forced out of competition. This category implies an element of coercion because people are not in this category by their own free will (Gross and Rayner 1985). Coyle and Ellis (1994) define this as a situation in which individuals may have little choice how they spend their time, who they associate with, what they wear or eat or where they live or work.

The fatalistic is not an active learning culture. Its main preoccupation is with its own survival and its behavioral strategy is ad hoc and opportunist. Hence it will be non-committal and unreliable in any attempts towards learning and innovation. Schwarz and Thompson (1990) explain that the fatalist will neither learn nor manage, it will only try to cope with whatever life deals out to it. So, at best the fatalist will use an avoidance strategy towards learning and innovation. Persons who have been forced to adapt to an organizational change against their wishes or those who have lost their competitive edge due to organizational changes are examples of the fatalist culture. Although the fatalist does not by itself offer much to the innovation process, it still serves an important function: *if present in large numbers, fatalists signal a pathological condition in the organization that could hamper the innovation process.* Since the fatalist uses the avoidance strategy to learning and innovation, for the remainder of this paper we focus mostly only on the three active learning cultures. The characteristics of the four learning cultures and their learning strategies are summarized in Figure 1.

In the discussion above, we support the three kinds of active learning cultures through examples of three different kinds of learning institutions. This should not be taken to imply

Figure 1. Characteristics and learning strategies of four learning cultures

Fatalist learning culture	**Hierarchical learning culture**
Learning strategy: avoidance	*Membership:* based on qualifications, past reputation
	Learning strategy: creation of specialized knowledge
	Job definition: clear, who does what is more important than results
	Rewards: on achieving set standards
	Focus: long-term
	e.g. universities
Competitive learning culture	**Egalitarian learning culture**
Membership: based on track records and achievements, networking abilities	*Membership*: based on approval by existing members
Learning strategy: entrepreneurial and innovative ideas, learning from networks	*Learning strategy*: social dialogue, critique, playing the devil's advocate
Job definition: interchangeable, results more important than who does the job	*Job definition*: as egalitarian as possible, leadership roles downplayed.
Rewards: for innovative ideas that bring fast results	*Rewards*: equally shared among all members
Focus: short-term	*Focus*: on group boundaries and protecting members from predatory outsiders
e.g. privately owned educational institutions	e.g. small research laboratories

that these learning cultural types can only be found in different firms and that they exist only in pure forms. On the contrary, we believe in the coexistence of multiple cultures, even counter cultures in the same firm (see also Patel 2005), although one culture may dominate at a certain time. For example, administrative functions in a large company are generally more rules-oriented and bureaucratic. They are often accused of being overly attached to their procedures and "*request forms*". Such departments like to do things by the book and would readily sacrifice opportunities to maintain order. For such cultures, any learning outside the realms of systematically structured procedures would not be learning at all. These exemplify the hierarchical learning culture. However, marketing and sales departments in the same company would have a very different learning culture. Their job requires them to react fast to market changes. Hence they are preoccupied with getting results and getting them fast. They are open to the ideas of learning from others and exchange of information and knowledge in a way that benefits them. These represent the competitive learning cultures.

The R&D department in the same company is a cohesive entity united by its group identity. This egalitarian learning culture feels the need to protect itself against other departments (such as marketing and sales) who do not understand the challenges and demands of the research process. Information and knowledge is closely guarded within the inner circle of the R&D department and will only be shared with people external to their group, if they are ensured that it will not be used against the interest of their members. It is not surprising therefore that popular press provides many illustrations of conflicts between marketing departments and R&D departments in companies. Their inherently different interests and objectives juxtapose them against one another. Finally, all those people in the company who are obliged to change against their wishes or those who have lost their

competitive advantage would be the fatalists. These are generally groups of people who do not have a *voice*. They neither support nor resist learning. They only cope and try to survive.

One question that emerges from the above discussion is: what makes the learning cultures we propose different from the corporate culture categories proposed by past researchers (e.g. Hofstede et al. 1990, Quinn and Rohrbaugh 1983)? The answer lies in the fact that the cultures we propose are not static categories. In fact, they are in constant rivalry with one another for more adherents (Thompson 1996). Also, each culture has its weaknesses and needs to depend on others for its survival (Douglas 1996). Consider the two dominant cultures: hierarchy and competition. The hierarchical culture pays attention to rules, regulations and standards and is long-term focused. However, its weakness stems from the fact that its preoccupation with rules and regulations could lead it to ignore certain opportunities for growth, learning and development (6 2003) and could paralyze it into inaction. On the other hand, although the competitive culture is good at "getting the job done quickly", it has no scruples in cutting a few corners along the way (see 6 2003, Williamson 1975, Patel 2005). Members of the competitive learning culture are also short-term focused (see also Thompson 1996). On its own, the hierarchical culture would lose out on opportunities. By itself the competitive learning culture would not be able to distinguish right from wrong. Only by existing together can these two cultures can overcome their weaknesses and ensure each other's survival. This interdependence and rivalry among the different cultures create a state of dynamic disequilibrium. Our conceptualization of learning cultures as being in a state of dynamic disequilibrium makes it different from the static categories proposed by past researches.

In this section we have discussed the characteristics and learning strategies of the four types of learning cultures. Based on this preliminary understanding, we anticipate that each of them has a preference for a different mode of learning.

Learning cultures and their preferred modes of learning

Nonaka (1994) is famous for his theory of organizational knowledge creation.[2] Nonaka explained that learning occurs through two modes: *internal knowledge creation* and *external knowledge transfer*. We believe that we can gain a better understanding of the roles of different learning cultures during the innovation process if we uncover their preference for different modes of learning.

Internal knowledge creation is a process of "learning by doing" within the firm that leads to the development of uncodified and codified knowledge (see Patel 2006 for details). An example of internal knowledge creation is the development of software for an employee resource planning (ERP) system. Since internal knowledge creation is a process of learning by doing, it is inherently a slow and uncertain process. Furthermore, because internal knowledge creation leads to uncodified and codified knowledge,[3] it enables the firm to comprehend external (similar or related) codified knowledge across different fields (Zahra and George 2002). Hence, learning through internal knowledge creation does not imply that the firm cannot or does not learn from sources of knowledge external to it. On the contrary, firms that learn through internal knowledge creation are better equipped to integrate internal and external codified knowledge at a later stage (see Patel 2006 for details).

Since internal knowledge creation is a time-consuming process, we believe that this mode of learning would not appeal to the competitive learning culture. On the other hand, since the hierarchical learning culture is much more prone to long-term social contracts, it

will prefer to invest itself in internal knowledge creation. The other option available to the hierarchical learning culture is to gain this knowledge from other companies by forming partnerships. However since forming partnerships requires tolerance towards uncertainty regarding the partner and the viability of the relationship itself, the hierarchical learning culture would be less likely to choose this alternative. If we temporarily assume that forming partnerships to acquire the knowledge from external sources is the only option available to the hierarchical learning culture, then it would focus on potential partners who have good standing and reputation in the market, thereby reducing the number of partnership options available to it. Finally, since members of the hierarchical culture favour security and stability over change and opportunities (Gross and Rayner 1985), we believe that they would prefer to learn through systematic procedures and hence through internal knowledge creation. Also, since the hierarchical learning culture appreciates specialization, investing in internal knowledge creation would appeal to it, despite it being a time-intensive exercise.

The second mode of learning, i.e. *external knowledge transfer*, is a process of adoption within the firm of codified knowledge developed outside the firm. Because external knowledge transfer uses knowledge developed by other firms, it is a fast and certain process. However, because external knowledge transfer does not lead to the development of uncodified knowledge within the firm, it does not enable the firm to comprehend similar external codified knowledge across different fields (Zahra and George 2002). Further, firms that learn through external knowledge transfer do not develop the ability to integrate internal and external codified knowledge. Hence, external knowledge transfer and internal knowledge creation differ from one another not only in the process involved but also in the resulting firm capabilities.

The competitive learning culture is much more pragmatic and less doctrinally-inclined than the hierarchical learning culture, and any means of development which will bring quick financial benefits would appeal to it (see Schwarz and Thompson 1990). External knowledge transfer would appeal to the competitive learning culture because it is a fast and easy way of acquiring knowledge without having to go through the tedious and time-intensive exercise of developing it internally. Internal knowledge creation would not appeal to the competitive learning culture because this culture is inherently short-term focused. Further, members of this culture are naturally inclined to networking with potential partners and to renegotiating new alliances. They also have an inherent ability to identify and exploit opportunities of mutual interest (Gross and Rayner 1985). Also, collaborating with others demands a certain degree of flexibility and tolerance for uncertainty because the outcomes of collaborative work are never completely under one's control. Unlike the hierarchical learning culture, the competitive learning culture has a fairly high level of tolerance for uncertainty. It likes to take risks and be rewarded for it (see Schwarz and Thompson 1990). For all these reasons this culture is open to learning from partners with complementary skills and hence would prefer external knowledge transfer.

Proposing that members of the hierarchical learning culture have a preference for internal knowledge creation does not mean that they cannot or will not learn from external sources. As explained earlier, internal knowledge creation facilitates future learning from external sources rather than inhibiting it. Conversely, the competitive learning culture has a preference for external knowledge transfer. Choosing external knowledge transfer limits its future possibility of learning through either mode of learning.

The third active learning culture is the egalitarian. What mode of learning does this learning culture prefer? As mentioned in earlier sections, members of the egalitarian learning culture are good at playing the "devil's advocate" and in stimulating social

dialogue (see also Rayner and Malone 1999, Patel 2005). Since the egalitarian learning culture is high on group and low on grid, it has a communal rationality and tries to maintain a strong group identity. In order to do this, it often resorts to a criticism of those that are outside the group. Further, it is often difficult for the two dominant learning cultures (hierarchical and competitive learning cultures) to reach out to one another due to their inherent differences on both grid and group dimensions (Rayner and Malone 1999, Patel 2005). The egalitarian learning culture can bridge this gap. It can reach out to the hierarchical learning culture by appealing to the high-group score and to the competitive learning culture by appealing to the low-grid score, thereby creating an interface for discussion during periods of change and transition. The egalitarian learning culture thus facilitates learning through social dialogue, critique and discourse.

Past research (see Patel 2006, Arthur 1990, Cohen and Levinthal 1994, Eisenhardt and Martin 2000, Patel and Pavitt 1997) shows that learning is path-dependent and that firms that facilitate modes of learning in a precise sequence during the innovation process will enjoy sustained innovation success. This prompts us to examine how the different learning cultures would react to the different stages of the innovation process.

Reactions of different learning cultures during the innovation process

We consider innovation to be a process that unfolds over time (see Patel 2006, Tushman and Anderson 1986, Henderson and Clark 1990). The innovation process has a radical phase followed by an incremental phase. Our interest lies in uncovering how the different learning cultures face each of these phases.

Reactions of different learning cultures to the radical phase

The radical phase is characterized by the development of a radical innovation and is accompanied by technological as well as market uncertainty within an industry (Garcia and Calantone 2002). Technological uncertainty arises because the radical innovation is based on a technology that differs substantially from existing technology (Chandy and Tellis 1998) and because there is no consensus among stakeholders in the industry about a commonly accepted architecture of the radical innovation (Abernathy and Utterback 1978, Anderson and Tushman 1990, Afuah 1998). Further, a radical innovation causes market uncertainty because a new market infrastructure with new competitors, suppliers and customers begins to emerge (Garcia and Calantone 2002). Consider the introduction of online banking in the mid to late 1990s as a recent example of a radical innovation in the traditional retail banking sector (see Chandy et al. 2003). Online banking is based on standard internet protocols, while traditional banking uses electronic data interchange (Banks 2001). The two key components in online banking are online banking platforms and servers (Starita 1999). During the radical phase, both these components used different meta-languages (Banks 2001). This lack of consensus during the radical phase resulted in intense competition among firms to get their design adopted as the dominant design by a majority of stakeholders within the industry (Anderson and Tushman 1990, Sahal 1981). Further, online banking led to market uncertainty due to the emergence of new computer-savvy customers**,** suppliers of technology and technology-savvy competitors.

We believe that, when faced with external market and technological uncertainties during the radical phase of the innovation process, each learning culture will react differently. The hierarchical learning culture faces uncertainties by resorting to procedures and rules. Hence if it lacks the knowledge required to face uncertainties it will adopt a safe

and systematic way of addressing this deficiency through internal knowledge creation. There is of course an easier solution to this problem, which entails forming alliances with other firms that have the desired knowledge. Forming partnerships and working with collaborators involves taking risks. The hierarchical learning culture, being in favor of stability rather than risk-taking, will prefer working towards internal knowledge creation rather than the creation of partnerships. In order to face uncertainties, the hierarchical learning culture also encourages clear task definitions, role differentiations and specialization. Therefore, procedures, standards, rules, specialization and clear job and role definitions are the tools that the hierarchical learning culture will use to face uncertainties in its environment. Although its preference for internal knowledge creation and specialization will slow down its efforts to become a "dominant player" in markets, this is not a cause for concern because there are few others who can stake a claim on the title during the radical phase. Further its choice of internal knowledge creation at this stage opens learning opportunities for the future.[4]

When faced with similar market and technological uncertainties, the competitive learning culture will exploit the situation to gain from it. The competitive mind set enjoys taking risks and being rewarded for it. Also since the competitive learning culture is short-term in focus, it will choose whatever developmental path brings it financial gains faster. Hence in the face of uncertainty, networking and forming advantageous alliances would be its most natural choice. At first glance it seems that this ability to network and create alliances gives the competitive learning culture an edge over the hierarchical learning culture during the radical phase. However, the market conditions that characterize the radical phase prevent this from happening. The radical phase, as mentioned earlier is characterized by a heavy competition and few (if any) "dominant" players in the industry. So there are no clear market leaders. Hence, forming alliances with other struggling firms will neither add value to the firm in question, nor would such collaborations lead to superior results.

Lastly, the egalitarian learning culture will face the market and technological uncertainties of the radical phase by assessing their impact on its members. It will stimulate discussions among members to evaluate the situation. If the uncertainty is threatening to its members it will seek a collective solution against it. Knowledge produced outside the realm of their own group would not appeal to them, except if it has an impact on the group members. In the context of market and technological uncertainty, the egalitarian learning culture would look for solutions that are in the interests of all its members. The social dialogue that the egalitarian stimulates at this stage will allow groups with diverse opinions about the radical innovation to express themselves. The reactions of the three active learning cultures during the radical phase of the innovation process are summarized in Table 1.

Comparing the reactions of the three learning cultures to the market and technological uncertainty that characterize the radical phase of the innovation process, the hierarchical

Table 1. Reactions of different learning cultures to the radical phase of the innovation process

Learning culture	Reactions
Hierarchical learning culture	Internal knowledge creation, role definition, specialization, time-consuming but potentially leading to optimal outcomes
Competitive learning culture	Forming partnerships and alliances with other struggling firms, short-term, but will not lead to optimal outcomes
Egalitarian learning culture	Discourse and discussions

learning culture seems best-equipped to face the situation. Although its choice of internal knowledge creation is more time-consuming, this option promises a potentially optimal outcome in the future. The competitive learning culture, owing to its preference for external knowledge transfer, limits its learning potential (because there are no dominant players and technological leaders to learn from at this stage). The egalitarian learning culture stimulates discussions about the radical innovation, but has no other contribution to make at this stage. We can therefore derive the tentative conclusion that following the hierarchical learning strategies during the radical phase will produce the best results for sustained innovation in firms. However, this is only part of the story. In order to understand the role of the learning cultures in sustained innovations, we also need to understand their reactions to the incremental phase of the innovation process.

Reactions of different learning cultures to the incremental phase

The incremental phase begins with the emergence of a dominant design (Tushman and Anderson 1986, Sahal 1981, Wade 1995) and is followed by the development of many incremental innovations over time. Emergence of a dominant design implies that the underlying radical technology is well understood by majority of stakeholders in the industry and that the new market infrastructure has developed well. This reduces technological and market uncertainty (Abernathy and Utterback 1978). Further, the incremental phase involves the development of many incremental innovations through two steps. First, components of the radical innovation are incrementally developed in terms of performance, quality and price (Dosi 1982, Malerba 1992). Second, these incremental components are integrated into the existing architecture of the radical innovation to develop incremental innovations (Henderson and Clark 1990). Reverting to our earlier example of online banking, the incremental phase began with the adoption of the Open Financial Exchange (OFX) standard as the dominant design and led to the development of incremental online banking innovations like e-lending, e-brokerage, e-insurance, e-cash management, check image and wireless banking (Furst et al. 2000, 2002). Development of many incremental innovations implies that firms are now compelled to compete on the number of incremental innovations they develop.

In a nutshell, during the incremental phase of the innovation process, dominant designs emerge and there is little market and technological uncertainty. Also firms compete on the number of incremental innovations developed. How do different learning cultures react to such an environment? The answer is simple: very much in the same way as they do to the radical phase. Nonetheless, the outcomes of their reactions are very different now due to the changed external conditions. The hierarchical learning culture would want to develop incremental innovations through internal knowledge creation. However, since the competition is now based on the number of incremental innovations produced by firms, developing many incremental innovations internally would be extremely time-consuming and labor-intensive. This would be impractical and would slow down results. Hence this would not be the optimal choice at this stage. The other option available to the hierarchical learning culture is to create alliances with different firms to develop the incremental innovations. Owing to its earlier choice of internal knowledge creation, it has acquired the capabilities to access and evaluate external codified and uncodified knowledge. This implies that, if it chooses to develop incremental innovations by forming alliances (external knowledge transfer) at this stage, it is well-equipped for that.

How would the competitive learning culture react to the incremental phase? It would react rapidly by forming many alliances with complimentary firms in order to develop

many incremental innovations in a short period of time. The competitive culture would be more active in this phase than the radical phase because now its networking capabilities come to the fore. One can rightly argue that its earlier choice of external knowledge transfer does not provide it with the capabilities to evaluate potential partners and their designs. However, in the incremental stage of the innovation process the dominant design and the dominant players are already well established. Hence, forming alliances or simply buying off incremental innovations from other firms is therefore much easier for the competitive learning culture now than it was during the radical phase.

Finally the egalitarian learning culture plays the same role during the incremental phase of the innovation process as it does during the radical phase. In other words, it stimulates discussion about the innovation and related changes and tries to protect the members from any external threat. The reactions of the three active learning cultures to the incremental phase of the innovation process are summarized in Table 2.

Past literature describes the radical and incremental phases as the two stages of the innovation process. We believe that in evolving from one phase to the other a firm passes through a period of transition. This period of transition would allow different actors the time to evaluate their innovation strategies and formulate new ones if required.

Reactions of different learning cultures during the transition period

As we argue earlier, the hierarchical learning culture comes to the fore during the radical phase and the competitive learning culture comes to the fore during the incremental phase. This means that, for a firm to be optimal in its innovation output, it has to shift learning strategies from hierarchy to competitive as the industry moves from the radical to the incremental phase of the innovation. This shifting of learning strategies is easier said than done owing to the inherent differences of these two dominant learning cultures. Although there is little reference to the transition period in extant literature on innovations, there is ample evidence in CT and other literature (see Patel 2007a, 2007b, Rayner and Malone 1999, Williamson 1975) supporting the inherent difficulty that the two active cultures, hierarchy and competition, have in reconciling to one other. It is in this period that the egalitarian learning culture comes to the fore.

As mentioned earlier, the egalitarian learning culture has a communal and critical rationality, which stresses the importance of fraternal and social cooperation (see Schwarz and Thompson 1990). Since this desired state of affairs is always threatened by the encroachment of hierarchy (which brings status differences) or by excessive competition (which introduces inequalities of wealth, power and knowledge), the egalitarian learning culture maintains its collective identity by criticizing what goes on outside the group

Table 2. Reactions of different learning cultures to the incremental phase of the innovation process

Learning culture	Reactions
Hierarchical learning culture	Internal knowledge creation to develop incremental innovations slows down the process, formation of alliances leads to optimal outcomes
Competitive learning culture	Forming partnerships and alliances with dominant players leads to optimal outcomes
Egalitarian learning culture	Discourse and discussions

(Schwarz and Thompson 1990). This makes the egalitarian the societal canary (Rayner and Malone 1999) that is always raising warning signals about potential problems that could arise and thereby stimulates social interaction between others. Also, being high on group and low on grid, the egalitarian can handle complex tasks (Thompson 1996). This makes the egalitarian much more useful during a period of change and turbulence. In the absence of the egalitarian learning culture, the hierarchical and competitive learning culture would not be able to see the other's viewpoint and would end up in deadlock. The egalitarian prevents this from happening. It appeals to the high-group nature of the hierarchy and the low-grid nature of the competitive culture to build a bridge between them. This is its special contribution to the innovation process. The reactions of the three active learning cultures to the transition period between the radical and incremental phases are summarized in Table 3.

Our discussion suggests that each kind of learning culture has its merits during specific stages of the innovation process. Can this understanding guide strategies for sustained innovations in firms?

Pathway to sustained innovation success

In previous sections of this conceptual paper, we have suggested that the hierarchical learning culture would come to the fore during the radical phase of the innovation process. We have also argued that this learning culture prefers internal knowledge creation. Also the competitive cultural learning culture comes to the fore during the incremental phase of the innovation process and has a preference for external knowledge transfer. Finally, the egalitarian learning culture is capable of generating dialogue between the two dominant and inherently opposite learning cultures (i.e. hierarchical and competitive) in environments of change. Hence, it is of value during the period of transition from the radical to incremental phase of the innovation process. Past empirical research has also shown that that firms (such as banks) that focus on internal knowledge creation during the radical phase and then on external knowledge transfer during the incremental phase of the innovation process enjoy sustained innovations (see Patel 2006). This past study shows that firms following this learning pathway are more successful in innovating than other firms using different learning pathways. Patel (2006) concludes that not only is learning path-dependent, but that certain pathways provide better outcomes than others.

Hence combining our suggestions with the empirical findings of Patel (2006), we suggest that firms that wish to enjoy sustained success in innovations should support hierarchical learning strategies in the radical phase of the innovation process followed by competitive learning strategies in the incremental phase. In the transition period between

Table 3.   Reactions of different learning cultures during the transition period between the radical and incremental phases of the innovation process

Learning culture(s)	Reactions
Hierarchical and competitive learning culture	Find it difficult to reconcile their differences
Egalitarian learning culture	Facilitates discourse and discussions, builds bridges between the other two active learning cultures, prevents deadlock, offers optimal solution

the two phases, firms should encourage egalitarian learning strategies. This learning pathway to sustained innovation success is summarized in Table 4.

Our suggestion has several managerial implications and challenges. Most importantly, although the four learning cultures co-exist in firms at all times, we recommend that managers encourage specific kinds of learning strategies at specific stages of the innovation process.

Managerial implications and challenges

In the previous section, we propose that *firms should encourage hierarchical learning strategies during the radical phase, egalitarian learning strategies during the transition phase and competitive learning strategies during the incremental phase of the innovation process, if they wish to enjoy sustained success in innovations.* However, as we have discussed earlier, each learning culture emerges due to shared and deeply embedded values and worldviews among members. Also, all four competing learning cultures exist in firms at all times. It is therefore not an easy task for managers to get members of different learning cultures to adopt the learning strategies of other cultures in order to fit in with the demands of the innovation process. In this section, we provide suggestions regarding how HR managers can facilitate this shift of learning strategies.

As explained earlier, the learning cultures we propose are not static categories, but rather a set of behavioral strategies that evolve over time and with changing contexts. It follows that managers' objectives should be to encourage employees to adopt learning strategies best suited to the innovation stage that the firm finds itself in at a particular point in time. The best innovation outcomes for the firm will come from employees adopting the hierarchical learning strategies during the radical phase, egalitarian during the transition phase and competitive learning strategies during the incremental phase, irrespective of their natural learning preferences. This implies that human resources managers need to encourage internal learning during the radical phase, discourse and discussions during the transition phase and creation of partnerships and alliances during the incremental phase of the innovation process. Clearly, this "*strategy-switching*" will not be easy for employees. Hence, training programs should be designed to help employees acquire this flexibility.

It also follows that, in order to encourage members of different learning cultures to use specific learning strategies that are best suited to the stage of the innovation process, managers need to align processes and rewards accordingly. For example, during the radical phase of the innovation process, managers should set up clear rules, regulations and standards and reward those who adhere to them. Job definitions and role identities should be clearly defined to avoid overlaps and confusion. Also, the human resources managers should make efforts to support internal knowledge creation. Resources and rewards should be allocated for those who invest in internal learning. As the firm moves towards the incremental

Table 4.   Learning pathway to sustained innovation success.

Chronological order	Phase of the innovation process	Learning strategy to be supported	Preferred mode of learning
I	Radical	Hierarchical	Internal knowledge creation
II	Transition	Egalitarian	Discourse and discussion
III	Incremental	Competitive	External knowledge transfer

phase, competitive learning strategies should be encouraged and rewarded. This would include practices that lead to establishing partnerships and networks for mutual gains. Employees who develop partnerships should be rewarded. Also during the transition period, managers should encourage discourse and open discussions. This means that, irrespective of the natural affiliations of members of different cultures, they should be encouraged to play the "devil's advocate" so as to stimulate discussions about the transition among members. Criticisms should be encouraged rather than suppressed, despite the potential generations of conflicts between different groups. The firm should even be proactive and appoint selected people as "devil's advocates" (see the example of Uniliver cited in Patel 2005). In addition, managers should discourage the generation of fatalism among employees through actively soliciting the input of all groups during the change process.

Theoretical implications and discussions

Our conceptual paper contributes to past literature in different ways. First, ours is one of the few studies to use CT to explore learning cultures and innovation. CT literature in the past has considered innovativeness as a characteristic of the competitive culture. The hierarchical culture has been cited as the societal gardener, the one that maintains order and works for the future. The egalitarian has been called the societal canary (Rayner and Malone 1999) that raises warning signals. Our paper adds to this literature by showing that, although the competitive culture is the natural innovator, all the three active cultures contribute to the innovation process in their own way. Each learning culture is optimal during a specific phase of the innovation process, so that, in order to enjoy sustained innovation, firms need all three active learning cultures during different stages of the innovation process.

Next, our study contributes to existing literature on training for innovation. Current literature suggests that, while firms invest a lot in training employees, there is little evidence of this leading to increased innovations (ASTD 2006). We address this knowledge gap by revealing that, since each stage of the innovation process needs to be supported through a different set of learning strategies, training programs should be designed to help employees to make this strategic switch. Although this strategy-shifting might not be easy, we believe that it holds the key to sustained success in innovations. Hence, firms should focus their training budgets towards making employees more flexible and adaptive. The first step obviously is to create awareness among employees that different stages of the innovation process demand different kinds of learning cultures and hence different learning strategies.

Third, our study contributes to the literature on culture and innovation. Unlike our predecessors, we treat culture as transactional and changing. Past studies addressing culture at the national and/or corporate level consider culture as traits shared by a group of people. They assume that this group of people is homogeneous and hence tend to draw broad generalizations (e.g. strongly religious countries are not receptive to innovation). We reckon that any recommendation based on such generalizations is likely to be ineffective at best and erroneous at worst, because it is based on the wrong premise of cultures being stagnant and homogenous. Unlike our predecessors, we use a much more dynamic approach to culture to study its impact on innovations. We argue that each learning culture, other than fatalism, has an active role to play during different stages of the innovation process. The fatalistic culture also contributes, albeit indirectly, to the innovations context: its dominance is symptomatic of underlying problems in the firms. With our framework, the focus of discussion shifts from *creating a culture of learning and innovation* to *nurturing different learning cultures at different stages of the innovation process so as to facilitate sustained innovation success in firms.*

Fourth, past literature gives confusing messages regarding the role that human resources managers play in facilitating learning and innovations in their firms (e.g. McColl 2005, Pervaiz 1998). Tjepkema (2002) claims that human resources professionals have generally failed to actively promote a learning culture in the workplace. While past literature insists that human resources managers and training departments should do more to drive learning activities and to facilitate continuous improvement and radical innovations, the same literature fails to provide recommendations for appropriate actions by managers. We have overcome this limitation, at least in part. By grounding learning within the cultural debate, we provide explicit suggestions to managers for each stage of the innovation process (see the previous section).

Finally, past literature has identified recruitment, incentives and reward systems as factors stimulating innovation in firms (see Carmen and Cano 2006, Shipton et al. 2006). However, Ichniowski and Shaw (2003) show that, although these factors have an impact on the innovation outcome of companies, some firms benefit more from these practices than others. Although we do not contest these findings, we offer an in-depth understanding of the complexity of the human resources manager's responsibility by exposing the complexity of the innovation process itself, which they are expected to facilitate. While past literature seems to treat innovation as a linear process, the outcome of which can be controlled through proper recruitment, induction, incentives and reward policies in a firm, we suggest that not only is innovation a highly complex and discontinuous process, but also that human resources managers need to adapt their practices according to the different stages of the innovation process. In light of this discussion, the role of the human resources manager is not as much about setting up human resources strategies as it is about *planning and managing strategy-shifts*. As Whittington and Mayer (2002) aptly point out, in a knowledge economy, it is *strategizing* and not the production of strategies that leads the firms to achieve their goals.

Notes

1. We do not question that sometimes past reputation and recent accomplishments go together. We only contend that given the choice between recent accomplishments and past qualifications, a competitive learning culture will focus more on the former. Also, it will not necessarily undermine past achievements, qualifications and reputation, especially if it can use these to generate tangible outcomes (for example, to attract more customers).
2. Nonaka described the knowledge creation process as an interchange between explicit and tacit knowledge. He proposed four ways of knowledge conversion: from tacit to tacit knowledge, from explicit to explicit knowledge, from tacit to explicit knowledge and from explicit to tacit knowledge. His spiral model of knowledge creation was based on dynamic interaction between these four knowledge conversion processes.
3. Codifiability of knowledge: the key output of learning is knowledge. Zander and Kogut (1995) state that codifiability is the degree to which knowledge can be represented by symbols. Based on this dimension, we differentiate between two types of knowledge: uncodified and codified knowledge. Uncodified knowledge is knowledge that has not been articulated and is not in a communicable form. This knowledge consists of tacit and latent knowledge. Tacit knowledge is difficult to articulate and only exists in the form of experiences (Polanyi 1958; Nonaka 1994; Nonaka and Takeuchi 1995). On the other hand, latent knowledge can be articulated and communicated but remains unarticulated because firms do not have any incentive to articulate it (Agrawal 2006). For example, software-programming skills like writing source code represents tacit knowledge, while the knowledge of possible errors in writing source code for a particular software program represents latent knowledge. Further, codified knowledge is knowledge that has been articulated and is in a communicable form, like formal language, symbols and objects. An enterprise resource planning (ERP) system for a bank or any other firm is an example of such codified knowledge (Nonaka and Takeuchi 1995, Choo 1998). Thus, both codified and uncodified knowledge are key outputs of learning.[0]

4. Because internal knowledge creation leads to uncodified and codified knowledge, it enables the firm to comprehend external (similar or related) codified knowledge across different fields (Zahra and George 2002). Hence, firms that learn through internal knowledge creation are better equipped to integrate internal and external codified knowledge at a later stage (see Patel 2006 for details)**.**

References

6, P., 2003. Institutional viability: a neo-Durkheimian theory. *Innovation: the European journal of social science research*, 16 (4), 395–415.

6, P., 2004. What's in a frame? Social organization, risk perception and the sociology of knowledge. *Journal of risk research*, 6 (2), n.s.

Abernathy, W. and Utterback, J., 1978. Patterns of industrial innovation. *Technology review*, 80, 97–107.

Afuah, A., 1998. *Innovation management: strategies, implementation, and profits.* New York: Oxford University Press.

Agrawal, A., 2006. Engaging the inventor: exploring licensing strategies for university inventions and the role of latent knowledge. *Strategic management journal*, 27, 63–79.

Anderson, P. and Tushman, M., 1990. Technological discontinuities and dominant designs: a cyclical model of technological change. *Administrative science quarterly*, 35, 604–633.

Argyris, C and Schon, D., 1996. *Organisational learning II: theory, method and practice.* Reading: MA: Addison-Wesley.

Arthur, B., 1990. Positive feedbacks in the economy. *Scientific American*, 262, 92–99.

ASTD, 2006. *HR focus. Spending on learning and training is increasing.* Alexandria, VA: ASTD.

Banks, E., 2001. *e-Finance: the electronic revolution.* New York: John Wiley & Sons.

Baungartner, R. and Zielowski, C., 2007. Analyzing zero emission strategies regarding impact on organizational culture and contribution to sustainable development. *Journal of cleaner production*, 15 (13/14), 1321–1327.

Boisot, M., 2000. Is there complexity beyond the reach of strategy? *Emergence*, 2 (1), 114–134.

Carmen, P. and Cano, P., 2006. Human resource management and its impact on innovation performance in companies. *International journal of technology management*, 35 (1), 11–27.

Chandy, R. and Tellis, G., 1998. Organizing for radical product innovation: the overlooked role of willingness to cannibalize. *Journal of marketing research*, 35, 474–487.

Chandy, R., Prabhu, J., and Antia, K., 2003. What will the future bring? Dominance, technology expectations, and radical innovation. *Journal of marketing*, 67, 1–18.

Choo, C., 1998. *The knowing organization.* New York: Oxford University Press.

Child, J. and Faulkner, D., 1998. *Strategies of co-operation: managing alliances, networks, and joint ventures.* Oxford: Oxford University Press.

Cohen, W. and Levinthal, D., 1994. Fortune favors the prepared firm. *Management science*, 40 (2), 227–251.

Coyle, D. and Ellis, R. eds, 1994. *Politics, policy and culture.* Boulder, CO: Westview Press.

Cummings, T. and Worley, C., 2004. *Organisational development and change.* 8th edn. Mason. OH: South Western College Publications.

Deshpande, R., Farley, J., and Webster, F., 1993. Corporate culture, customer orientation and innovativeness in Japanese firms: a quadrad analysis. *Journal of marketing*, 57, 23–37.

Douglas, M., 1970. *Natural symbols.* London: Barrie and Rockliffe.

Douglas, M., 1978. *Cultural bias.* Occasional Paper 35. London: Royal Anthropological Institute.

Douglas, M., 1986. *How institutions think*. London: Routledge and Keegan Paul.

Douglas, M., 1996. *Thought styles: critical essays on good taste.* London: Sage.

Dosi, G., 1982. Technological paradigms and technological trajectories: a suggested interpretation of the determinants and directions of technological change. *Research policy*, 11, 147–162.

Easterby-Smith, M. and Araujo, L., 1999. Organisational learning: current debates and opportunities. *In*: M. Easterby-Smith, J. Burgoyne and L. Araujo, eds. *Organisational learning and the learning organisation*. Thousand Oaks, CA: Sage, 1–21.

Eisenhardt, K. and Martin, J., 2000. Dynamic capabilities: what are they? *Strategic management journal*, 21, 1105–1121.

Furst, K., Lang, W., and Nolle, D., 2000. Who offers internet banking? Office of the comptroller of currency. *Quarterly journal*, 19 (2), 29–48.

Furst, K., Lang, W., and Nolle, D., 2002. *Internet banking: developments and prospects*. Cambridge, MA: Program on Information Resources Policy, Harvard University.

Garcia, R. and Calantone, R., 2002. A critical look at technological innovation typology and innovativeness terminology: a literature review. *The journal of product innovation management*, 19, 110–132.

GLOBE: Gupta, V., Surie, G., Javidan, M., and Chhokar, J., 2002. Southern Asia cluster: where the old meets the new? *Journal of world business*, 37 (1), 16–27.

Gross, J. and Rayner, S., 1985. *Measuring culture. A paradigm for the analysis of social organization*. New York: Columbia Press.

Henderson, R. and Clark, K., 1990. Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms. *Administrative science quarterly*, 35, 9–30.

Herbig, P. and Dunphy, S., 1998. Culture and innovation. *An international journal of cross-cultural management*, 5 (4), 13–21.

Hoecklin, L., 1993. *Managing cultural differences for competitive advantage*. The Economist Intelligence Unit, Special Report no, 656.

Hofstede, G., 1980. *Culture's consequences – international differences in work-related values*. Thousand Oaks, CA: Sage. [Revised in 1984.]

Hofstede, G., 1991. *Cultures and organizations: software of the mind*. London: McGraw-Hill.

Hofstede, G., Neuijen, B., Ohayv, D. and Sanders, G., 1990. Measuring organisational cultures: a qualitative and quantitative study across twenty cases. *Administrative science quarterly*, 35, 286–316.

Hurley, R. and Hult, G., 1998. Innovation, market orientation, and organisational learning: an integration and empirical examination. *Journal of marketing*, 62 (3), 42–54.

Ichniowski, C. and Shaw, K., 2003. Beyond incentive pay: insiders' estimates of the value of complementary human resource management practices. *Journal of economic perspectives*, 17 (1), 155–180.

Kapferer, B., 1972. *Strategy and transaction on an African factory: African workers and Indian management in a Zambian town*. London: Manchester University Press.

Lien, B., Hung, R., and McLean, G., 2007. Organizational learning as an organization development intervention in six high technology firms in Taiwan: an exploratory case study. *Human resource development quarterly*, 18 (2), 211–228.

Malerba, F., 1992. Learning by firms and incremental technical change. *The economic journal*, 102, 845–859.

Mars, G., 1982. *Cheats at work: an anthropology of workplace crime*. London: Allen & Unwin.

Marsick, V. and Watkins, K., 1994. The learning organisation: an integrative vision for HRD. *Human resource development quarterly*, 5 (4), 353–360.

McColl, G., 2005. Culture breeds ideas. *BRW*, 27 (23), 54–57.

McLean, G., 2006. *Organisational development: principles, processes, performance*. San Francisco, CA: Berrett-Koehler.

Moynihan, D., 2005. Goal-based learning and the future of performance management. *Public administration review*, 65 (2), 203–216.

Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. *Organizational science*, 5 (1), 14–37.

Nonaka, I. and Takeuchi, H., 1995. *The knowledge-creating company: how Japanese companies create the dynamics of innovation*. Oxford: Oxford University Press.

Patel, C., 2006. *Slow and steady wins the race: learning and the innovation process*. Thesis (PhD). Open University.

Patel, T., 2005. *Using dynamic cultural theories to explain the viability of international strategic alliances: a focus on Indo-French alliances*. Thesis (PhD). Open University.

Patel, T., 2007a. The role of dynamic cultural theories to explain the viability of international strategic alliances: a focus on Indo-French alliances. *Management decision*, 45 (10), 1532–1559.

Patel, T., 2007b. *Stereotypes of intercultural management: a dynamic appreciation of viability of French-Indian strategic alliances*. Delft: Eburon.

Patel, P. and Pavitt, K., 1997. The technological competencies of the world's largest firms: complex and path-dependent, but not much variety. *Research policy*, 26, 141–156.

Pervaiz K., 1998. Culture and climate for innovation. *European journal of innovation management*, 1 (1), 30–43.

Polanyi, M., 1958. *Personal knowledge*. London: Routledge.

Quinn, R. and Rohrbaugh, J., 1983. A spatial model of effectiveness criteria: toward a competing values approach to organizational analysis. *Management science*, 29 (3), 363–377.

Raybould, B., 1995. Performance support engineering: an emerging development methodology for enabling organisational learning. *Performance improvement quarterly*, 8 (1), 7–22.

Rayner, S., 1995. A conceptual map of human values in equity and social considerations related to climate change. *In*: A. Katama, ed. *Equity and social considerations related to climate change*. Nairobi: ICIPE Science Press.

Rayner, S. and Malone, E., 1999. Security, governance and the environment. *In*: M.R. Lowi and B.R. Shaw, eds. *Environment and security: discourse and practices*. Basingstoke: Macmillan.

Reece, D., 2007. What enables innovation in the private sector? Lessons from the development of salt-tolerant hybrid rice. *Journal of International Development*, 19 (6), 853–863.

Sahal, D., 1981. *Patterns of technological innovation*. Reading, MA: Addison-Wesley.

Salisbury, M., 2001. Creating a process for capturing and leveraging intellectual capital. *Performance improvement quarterly*, 13 (3), 202–219.

Sathe, V., 1985. *Culture and related corporate realities*. Homewood, IL: Irwin.

Schein, E., 1985. *Organizational culture and leadership: a dynamic view*. San Francisco, CA: Jossey-Bass.

Schwarz, M. and Thompson, M., 1990. *Divided we stand: redefining politics, technology and social choice*. London: Harvester Wheatsheaf.

Senge, P., 1990. *The fifth discipline: the art and practice of the learning organisation*. New York: Doubleday.

Shipton, H., West, M., Dawson, J., Birdi, K., and Patterson, M., 2006. Human resource management as a predictor of innovation. *Human resource management journal*, 16 (1), 3–27.

Starita, L., 1999. *Online banking: a strategic perspective*. Context Overview Report, R-08-7031-Gartner.

Tellis, G., Prabhu, J. and Chandy, R., in press. Radical innovation across nations: the pre-eminence of corporate culture. *Journal of marketing*, forthcoming Jan 2009.

Thompson, M., 1992. The dynamics of cultural theory and implications for the enterprise cultures. In: S. Hargreaues Heap and A. Ross, eds. *Understanding the enterprise culture: themes in the work of Mary Douglas*. Edinburgh: Edinburgh University Press.

Thompson, M., 1996. *Inherent relationality: an anti-dualistic approach to institutions*. Bergen: LOS Centre.

Thompson, M. and Wildavsky, A., 1986. A cultural theory of information bias in organizations. *Journal of management studies*, 23 (3), 273–286.

Tjepkema, S., 2002. *The learning infrastructure of self-managing work teams*. Enschede: Twente University Press.

Trompenaar, F. and Turner, C., 1997. *Riding the waves of culture: understanding diversity in global business*. New York: McGraw Hill.

Tushman, M. and Anderson, P., 1986. Technological discontinuities and organizational environments. *Administrative science quarterly*, 31, 439–465.

Wade, J., 1995. Dynamics of organizational communities and technological bandwagons: an empirical investigation of community evolution in the microprocessor market. *Strategic management journal*, 16 (summer special issue), 111–133.

Whittington, R. and Mayer, M., 2002. Response to Kay: Chandlerism in post-war Europe: strategic and structural change in France, Germany and the UK, 1950–1993: a comment. *Industrial and corporate change*, 11 (1), 199–206.

Wildavsky, A., 1987. Cultural theory of responsibility. *In*: J.-E. Lane, ed. *Bureaucracy and public choice*. London: Sage.

Williamson, O., 1975. *Markets and hierarchies: analysis and antitrust implications*. New York: Free Press.

Yang, J., Rui, M., and Wang, J., 2006. Enhancing the firm's innovation capability through knowledge management: a study of high technology firms in China. *International journal of technology management*, 36 (4), 305–317.

Zahra, S. and George, G., 2002. Absorptive capacity: a review, reconceptualization, and extension. *Academy of management review*, 27 (2), 185–203.

Zander, U. and Kogut, B., 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities: an empirical test. *Organization science*, 6 (1), 76–92.